

# WISER User's Guide

Version 2.0



Wireless Information System  
for Emergency Responders



2004-07-16

Prepared for:

**National Library of Medicine**  
Specialized Information Services  
National Institutes of Health – DHHS  
6707 Democracy Blvd. Suite 510  
Bethesda, MD 20892  
<http://www.sis.nlm.nih.gov>

Prepared under contract by:  
**Next Century Corporation**  
8101 Sandy Spring Road  
Laurel, Maryland 20707  
301.939.2600  
<http://www.nextcentury.com>





## Table of Contents

<b>1. Introduction .....</b>	<b>3</b>
1.1. Features.....	3
1.2. System Requirements .....	3
1.3. Disclaimer .....	3
1.4. Software Used by WISER.....	3
<b>2. Installation .....</b>	<b>3</b>
2.1. Microsoft Windows Automated Setup.....	3
2.1.1. Quick-Start Instructions.....	3
2.1.2. Detailed Instructions.....	3
2.1.3. Uninstalling from MS Windows .....	3
2.2. ZIP Download .....	3
2.3. Compressed Gzip Download .....	3
<b>3. Using WISER .....</b>	<b>3</b>
3.1. Main Page.....	3
3.1.1. Setting the User Profile .....	3
3.1.2. Known Substance .....	3
3.1.2.1. Search by Name .....	3
3.1.2.2. Search by Number.....	3
3.1.3. Unknown Substance .....	3
3.2. Data Page.....	3
3.3. Identifying Unknown Substances .....	3
3.3.1. Identify Substance Page .....	3
3.3.2. Properties Page .....	3
3.3.3. Symptoms Page.....	3
3.3.4. Search Results.....	3
3.4. Miscellaneous .....	3
3.4.1. Navigation .....	3
3.4.2. Help Menus .....	3
<b>4. Tutorial.....</b>	<b>3</b>
4.1. Known Substance.....	3
4.2. Unknown Substance.....	3
<b>5. About NLM.....</b>	<b>3</b>

# 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, tablet computers, field laptops, mobile phones, and mobile data terminals. It aids in the identification of unknown substances and, once the substance is identified, provides guidance on immediate actions necessary to save lives and protect the environment. Substance information and identification properties come from the Hazardous Substances Data Bank (HSDB), developed and maintained by the National Library of Medicine.

WISER currently exists as a standalone PDA application for Palm OS devices. It contains HSDB information and decision support logic for 390 substances. The substances were chosen based on First Responder inputs, degree of chemical hazard, and 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 data from the Hazardous Substance Data Bank, covering basic, physical, hazardous material, medical, and environmental areas
- 390 substances, chosen based on First Responder inputs, degree of chemical hazard, and historical frequency of incidents
- Substance identification support, based on physical properties and patient symptoms

## 1.2. System Requirements

To install and run WISER you need the following:

- A Palm OS device running Palm OS 3.5 or higher.
- 14 megabytes of available space, either on the handheld or on an expansion card, for the 390-substance version of WISER (2 megabytes for the 44-substance version).
- Personal computer with the following installed software:
  - Software to synchronize with your handheld, e.g., Palm Desktop for MS Windows or Mac OS, or pilot-link for Linux/Unix
  - Adobe Reader for viewing the WISER documentation: Reader is available for free download from the [Adobe](#) web site.

NOTE for Palm Desktop uses: It is highly recommended that you use the latest version of Palm Desktop that is compatible with your version of Palm OS. Free upgrades can be downloaded from the [PalmOne](#) website. Use of older versions has proved to result in significantly longer times to install the large WISER database file.

To determine the amount of memory on your Palm OS device, open the *Application Launcher* and select the *App→Info...* menu option. The resulting display includes the amount of free space available on the

handheld. If your device has an expansion card, change the 'Device' drop-down list to 'Card' to determine its free space.

### 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.

### 1.4. Software Used by WISER

The WISER application code and WISER installer use software from several other software packages. The licenses for these software packages are available in the file DisclaimerAndLicenses.txt which is included with the WISER distribution. The software packages used by WISER are:

- Inno Setup - copyright by Jordan Russell. See: <http://www.jrsoftware.org/isinfo.php>. Inno Setup is used to create the Windows Installer.
- Palm Auto Installer - copyright by Jim Douglas Computing. See: <http://www.jim-douglas.com>. The Palm Auto Installer is used by the Windows installer to place the Palm files into the install queue.
- Gnuplot - copyright by Thomas Williams, Colin Kelley. See: <http://www.gnuplot.info>. Two functions (set\_tic and double\_raise) from the Gnuplot code are used in the calculation of where to put tics on the progress bar on the Search Page, the Symptoms Page, and the Properties Page.
- MathLib - copyright by Rick Huebner. See: <http://www.radiks.net/~rhuebner/mathlib.html>. A number of MathLib functions are used to perform the calculations needed by set\_tic and double\_raise from Gnuplot.

## 2. Installation

A setup program, WISER.exe, is available for download from the [WISER website](#) for installing on MS Windows platforms. A WISER.zip file is also available and should be used if installing on a Mac; a compressed tar file is available for use if installing on a Unix/Linux machine.

### 2.1. Microsoft Windows Automated Setup

#### 2.1.1. Quick-Start Instructions

1. Download and run the WISER.exe setup program.
2. The WISER handheld files will be automatically loaded into the Palm Desktop install utility (Quick Install or Install Tool).
3. If applicable, within the Palm Desktop install utility, distribute the files as required between the handheld and expansion card.
4. Run Palm Desktop's HotSync to load the files onto your device.

#### 2.1.2. Detailed Instructions

1. Download the WISER.exe setup program from the WISER website and run it. This copies the WISER documentation to your computer, as well as the files that must be installed onto your handheld device via a HotSync. By default, these files are located under the folder "C:\Program Files\WISER\PalmOS", and consist of:

**C:\Program Files**

**\WISER**

**\PalmOS**

README.TXT (this file)

QuickStart.pdf

WISER User Guide.pdf

unins000.dat (required for uninstalling)

unins000.exe (required for uninstalling)

**\Handheld**

WISER.prc (Palm application file)

**\Data \***

**\390-Substances**

WISERidx.pdb (Palm database file)

WISERele.pdb (Palm database file)

\* There are 390- and 44-substance versions of the PDB (palm database) files, depending on which version of the installer is downloaded. Each creates a separate folder under the Data folder that corresponds to the number of substances, so that multiple downloads are possible.

2. When the installation completes, the Palm Desktop's install utility is launched. For Palm Desktop version 4.1 or greater, this is Quick Install, otherwise it is Install Tool. In either case, it will show the WISER Palm files that will be installed to your handheld during the next HotSync:

- a. WISER.pdb
- b. WISERidx.prc
- c. WISERele.PDB

3. By default, the WISER Palm files will be installed to your handheld device's RAM. **NOTE WELL:** the .pdb files are very large (over 13 MB for the 390 substance version), and thus many users may require or desire that these files be loaded on an expansion card (if the device is so equipped). To verify the amount of free memory on your device, tap the "Info..." option from your handheld's application launcher App menu.

If it is desired or required that the WISER files be placed on an expansion card, change their destination within the Palm Desktop install utility. With Quick Install, you can simply drag files between the Handheld and Expansion Card areas; with Install Tool, press the "Change Destination..." button and then distribute the files as desired.

**NOTE** that the PRC file may be installed in a separate location (handheld vs. card) than the PDB files, but both PDB files **MUST** be in the same location. If installation to an expansion card is desired, it is highly recommended that the small WISER.prc be installed on the handheld, and the two .pdb files be installed on the card, so that WISER is accessible from the handheld's application launcher (without having to navigate to the card).

4. Copies of the WISER Palm files will remain on your computer in the "Handheld" folder shown above in case you need to reinstall them on your handheld in the future. Simply double-click these files to load them into the Palm Desktop's install utility.

### 2.1.3. Uninstalling from MS Windows

Following installation via the WISER.exe setup program, WISER can be uninstalled from your Windows PC via the Control Panel's Add/Remove Programs. This is dependent on the uninsXXX.exe/.dat files that are in the WISER installation location.

## 2.2. ZIP Download

WISER is also available for download as a Zip archive. Mac users should download this file, the contents of which can be extracted using the StuffIt Extractor product that is included in Mac OS.

1. Download WISER.zip and extract its contents. The directory hierarchy is the same as that shown above in the MS Windows installation details.
2. Manually load the contents of the "handheld" folder (WISER.prc, WISERidx.pdb, WISERele.pdb) into Palm Desktop's install utility (Quick Install or Install Tool). E.g., double-click the files to automatically load them.
3. If applicable, within the Palm Desktop install utility, distribute the files as required between the handheld and expansion card.
4. Run Palm Desktop's HotSync to load the files onto your device.

## 2.3. Compressed Gzip Download

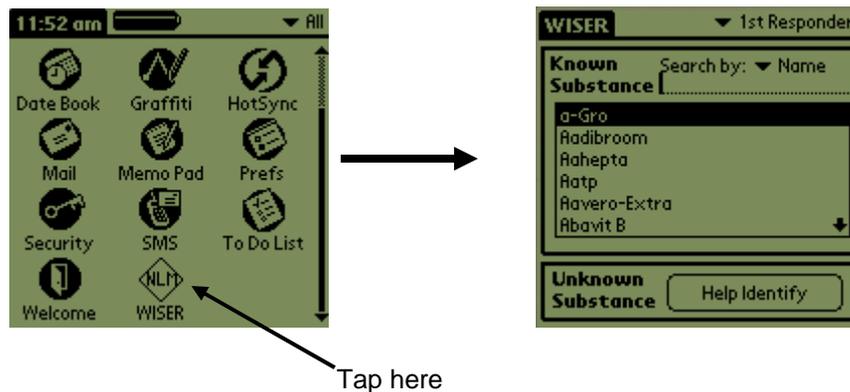
WISER is also available for download as a compressed gzip file. Unix/Linux users should download this file. Installation requires an installer program such as pilot-link.

1. Download WISER.tar.gz and place it in the folder that you want to extract it into. Extract the contents with the command 'tar -xvz WISER.tar.gz'. The directory hierarchy is the same as that shown above in the MS Windows installation details.
2. Install the contents of the handheld folder (WISER.prc, WISERidx.pdb, WISERele.pdb). Using pilot-link, the command is 'pilot-xfer /dev/pilot -i WISER.prc Data/390-Substances/WISERidx.pdb Data/390-Substances/WISERele.pdb'.

## 3. Using WISER

The WISER application is run from Application Launcher.

1. Tap the Application Launcher icon 
2. Tap the WISER icon to launch the application



The remainder of this section details the functionality on each of the forms that comprise the WISER application.

### 3.1. Main Page

The main page is presented upon startup of WISER or any time the up-arrow is tapped in the top right corner of one of the other pages. From here the main functionality of WISER is accessed, including:

- Setting the User Profile
- Searching for a known substances in the substance list
- Launching the functionality for identifying an unknown substance

#### 3.1.1. Setting the User Profile

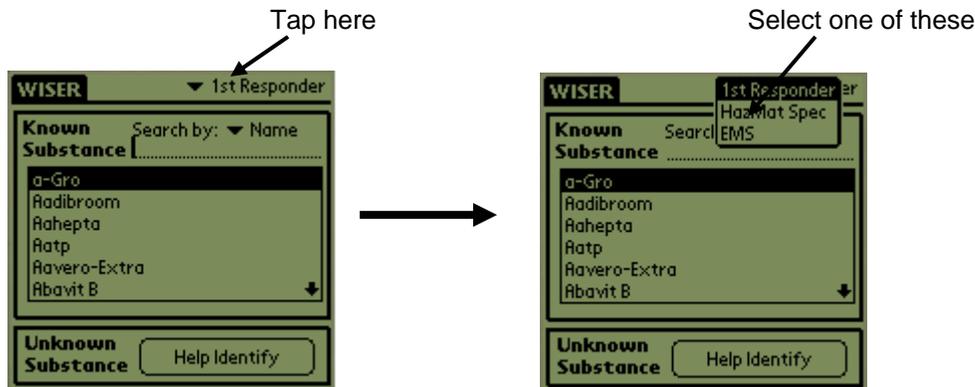
The User Profile determines how certain information is presented by WISER, tailoring the application to suit the needs of the type of user. Specifically, it controls what 'hot links' are presented on the [Data Page's](#) data menu, ensuring that the most relevant information is the most readily available.

To set the User Profile, select the option that best describes your role from the pull-down menu on the upper-right of the Main page.

As shown in the figure below, options are available for:

- 1<sup>st</sup> Responder, e.g., first engine on the scene
- HAZMAT Specialist

- Emergency Medical Specialist (EMS)



Each time WISER is started, the User Profile setting from its previous use is restored.

### 3.1.2. Known Substance

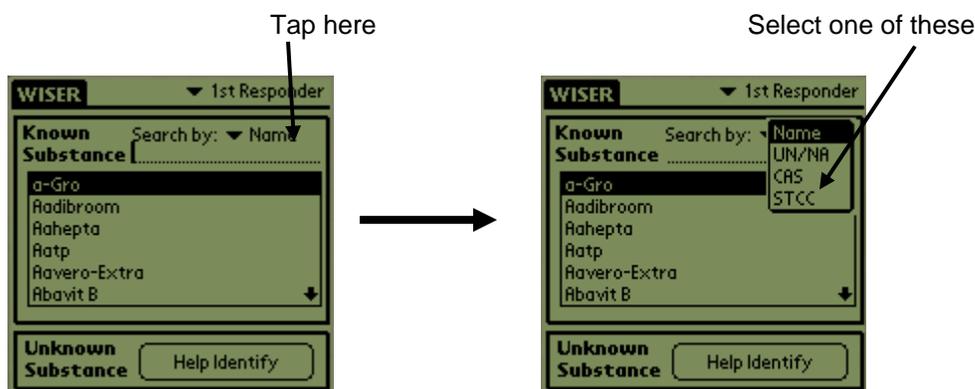
If you know what the substance is, you can locate it by one of the following methods:

- Scrolling through the list of names using the up and down arrows on the substance list
- Scrolling through the list of names using the hardware keys in the bottom center of the device
- Entering the name of the substance in the **Known Substance** field
- Entering one of the substance's identification numbers in the **Known Substance** field, where the possibilities are UN/NA number, CAS registry number, and STCC number



To use the **Known Substance** text field, you enter Graffiti, the native Palm alphabet, or use the built in/on screen keyboard. As you enter characters, they appear in the text field, and the list scrolls to the first matching substance. The **Search by** pull-down menu selection controls whether the substance name or an identification number should be entered, and controls the ordering of the list. The options available are as follows:

- Name: list is ordered alphabetically by name
- UN/NA: list is order by UN/NA number
- CAS: list is order by CAS registry number
- STCC: list is ordered by STCC number



Upon locating the desired substance in the substance list, tapping it displays the [Data Page](#) for that substance

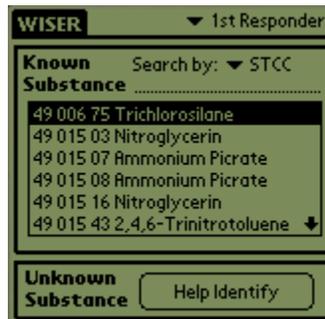
### 3.1.2.1. Search by Name

As shown in the figure above, when **Name** is selected from the **Search By** menu, the substance list is alphabetically sorted, and is augmented with “aliases”, i.e. other names by which the HSDB substances in WISER are known.

Note that numbers and punctuation that prefix a name are ignored for sorting and search purposes. When entering text in the **Known Substance** field, start with the first letter.

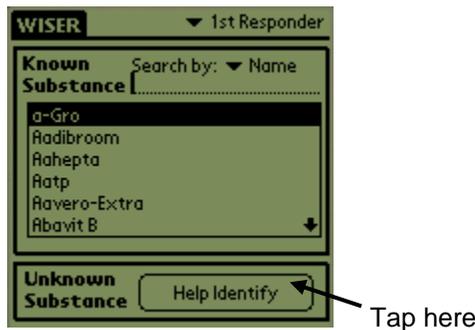
### 3.1.2.2. Search by Number

As shown in the figure below, when **UN/NA**, **CAS**, or **STCC** is selected from the **Search By** menu, the substance list contains only the HSDB substance names (no aliases), is order by the selected identification number, and each substance name is prefixed with the identification number.



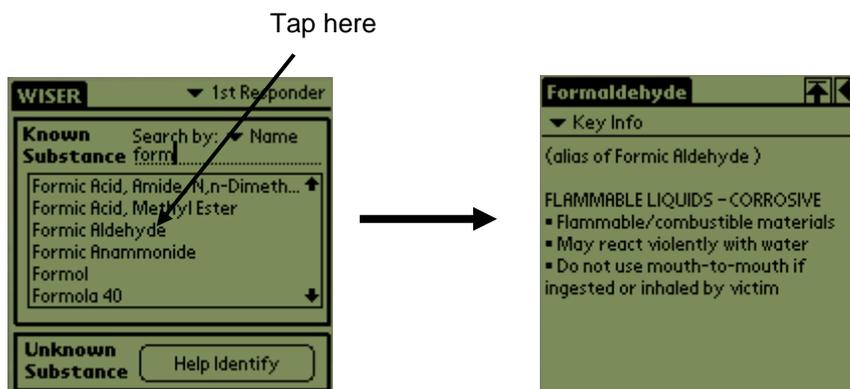
### 3.1.3. Unknown Substance

If you are trying to identify an unknown substance, tap the **Help Identify** button to advance to the [Search Page](#).



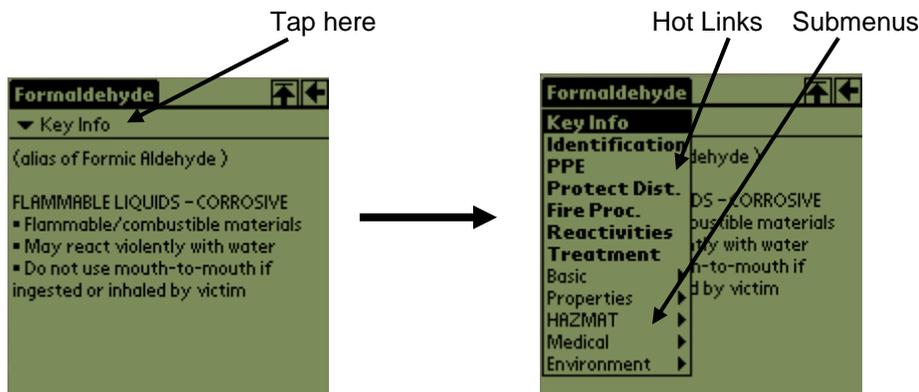
## 3.2. Data Page

The Data Page is presented when you tap a substance name from the [Main page](#) or from the [Search Results page](#). It is used to select and view all data that is available for the substance.

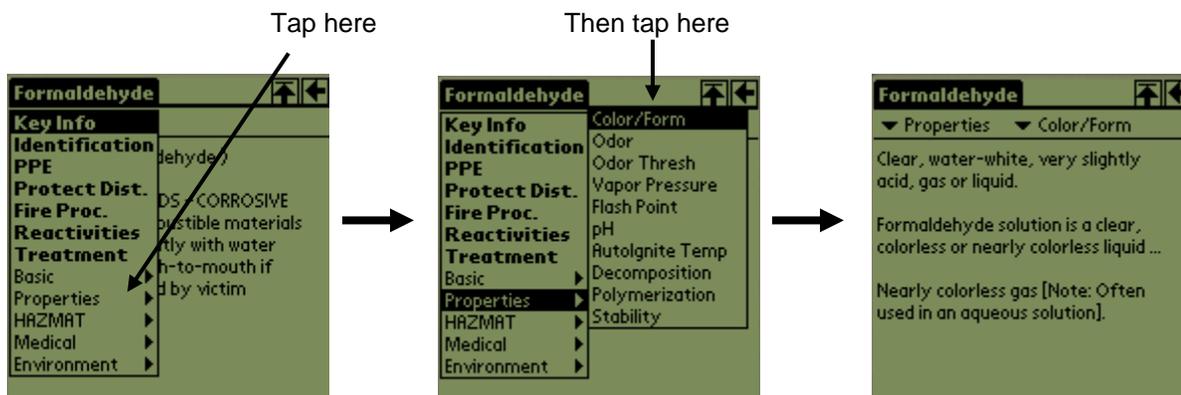


As shown above, the Data Page initially displays Key Info, a summary of the most immediate, critical aspects of a substance. If an alias of the substance was selected from the Main page, the Key Info text is preceded with the alias. In the above example, "Formic Aldehyde," an alias of the substance known in the HSDB as Formaldehyde, was chosen from the Main page's substance list.

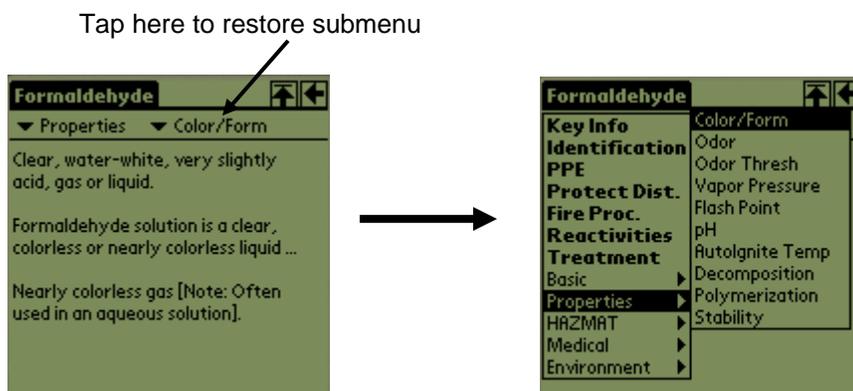
To see additional data, tap the pull-down menu on the left (initially showing 'Key Info'), as shown below to bring up a menu of 'hot links' and submenus.



The hot links are generally duplicates of items in the submenus, but provide a quicker way to get to the most relevant information for user profile. What hot links are available depend on the [user profile](#) selected on the Main page. The bottom portion of the data menu contains submenus, where each submenu represents a category of options. Tapping one of these pops up the submenu, listing the data elements in that category. As shown below, tapping a submenu item to close the menus and replaces the previous data display contents with the selected data element.



A heading bar above the data displays the menu and submenu selections. You can tap either to reopen the corresponding menu. For example, tap the submenu selection to quickly reopen the submenu and select an alternate option in that category.



The hot links that are available on the data menu are as follows. Each is a duplicate of one of the submenus, except for those “custom” options that are noted.

- Common to all user profiles:
  - Key Info – this custom option present the most immediate dangers or considerations for an encounter with the substance
  - Identification – this custom option provides a summary of the properties and symptoms associated with the substance; it reflects the data that is used when [searching for an unknown](#) substance
- 1<sup>st</sup> Responder
  - PPE – also available from the HAZMAT submenu
  - Protective Distance – this custom option reflects the Public Safety section of the DOT Emergency Response Guidebook
  - Fire Fighting Procedures – also available from the HAZMAT submenu
  - Reactivities & Incompatibilities – also available from the HAZMAT submenu
  - Treatment Overview – also available from the Medical submenu
- HAZMAT
  - Physical Properties (custom)
  - PPE – also available from the HAZMAT submenu
  - IDLH – also available from the Medical submenu
  - Flammable Limits – also available from the HAZMAT submenu
  - NFPA Hazard Classification – also available from the HAZMAT submenu
- EMS
  - Treatment Overview – also available from the Medical submenu
  - Clinical Effects – also available from the Medical submenu

- Toxicity Summary – also available from the Medical submenu
- IDLH – also available from the Medical submenu
- NFPA Hazard Classification – also available from the HAZMAT submenu

The data elements available from the submenus of the data menu are shown below:

#### Basic Information

- UN/NA/IMO identification numbers
- CAS Registry Number
- STCC Number
- Synonyms
- Molecular Formula
- Shipment Methods & Regulations
- EPA Hazardous Waste Number
- Major Uses
- Storage Conditions

- PPE (Personal Protective Equipment & Clothing)
- Flammable Limits
- Toxic Combustion Products
- Explosive Limits & Potential
- Reactivities & Incompatibilities
- Other Firefighting Hazards
- Other Hazardous Reactions
- Cleanup Methods
- Disposal Methods

#### Properties

- Color and Form
- Odor
- Odor Threshold
- Taste
- Density/Specific Gravity
- Molecular Formula
- Vapor Density
- Vapor Pressure
- Flash Point
- pH
- Melting Point
- Boiling Point
- Autoignition Temperature
- Decomposition
- Polymerization
- Stability/Shelf Life
- Viscosity
- Solubility

#### Medical Information

- Treatment Overview
- Clinical Effects
- IDLH (Immediately Dangerous to Life or Health)
- Threshold Limit Values
- NIOSH Recommended Exposure Levels
- OSHA Standards
- Skin, Eye and Respiratory Irritations
- Other Preventive Measures
- Toxicity Summary
- Range of Toxicity
- Laboratory
- Evidence for Carcinogenicity
- Radiation Limits & Potential

#### Hazardous Material Information

- DOT Emergency Guidelines
- NFPA Hazard Classification
- Fire Potential
- Fire Fighting Procedures
- Hazards Summary

#### Environmental Information

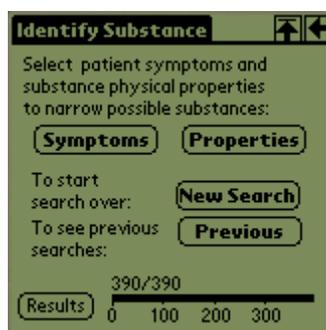
- Environmental Fate/Exposure Summary
- Environmental Fate
- CERCLA Reportable Quantities
- Non-Human Toxicity Values
- Ecotoxicity Values
- Soil Adsorption/Mobility
- Volatilization from Water/Soil

### 3.3. Identifying Unknown Substances

When the substance involved in an incident is unknown, WISER can assist in identifying it. This capability is accessed via the [Help Identify](#) button on the Main page. It allows the user to select symptoms and properties to narrow down the list of possible substances. The symptoms are those exhibited by victims exposed to the substance, and the properties are the physical properties of the substance itself.

#### 3.3.1. Identify Substance Page

The Identify Substance page is used to initiate 'searches' within the WISER substances for an unknown substance.

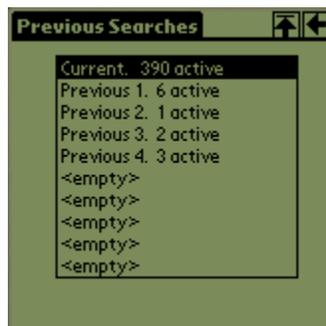


Tap on the **Symptoms** or **Properties** button to display the corresponding page, where patient [symptoms](#) and physical [properties](#) of the substance can be entered.

A progress bar at the bottom shows the number of matching substances based on the current symptom and property selections, and the 'Results' button opens the Search Results page to display a list of those substances.

The **New Search** button clears the selections of the current search. Those selections are saved in memory so that they can be recalled later via the **Previous** button. The progress bar resets to the maximum number of substances, and the search starts over.

A fixed number of previous searches are automatically saved and can be resumed. Tap the **Previous** button to display a list of the saved previous searches. Up to 10 previous searches are available, with each providing an indication of the number of substances matched by the search. Tap one of the previous searches in the list to replace the current search with the previous search, restoring the property and symptom selections from that search. Note that the list will display "<empty>" indications until enough searches have been performed to fill the list.



### 3.3.2. Properties Page

To enter physical properties of the unknown substance, navigate to the Properties page by tapping the **Properties** button on the [Identify Substance](#) page.



Similar to the Identify Substance page, the progress bar at the bottom shows the number of matching substances based on the current symptom and property selections, and the **Results** button opens the [Search Results](#) page to display a list of those substances.

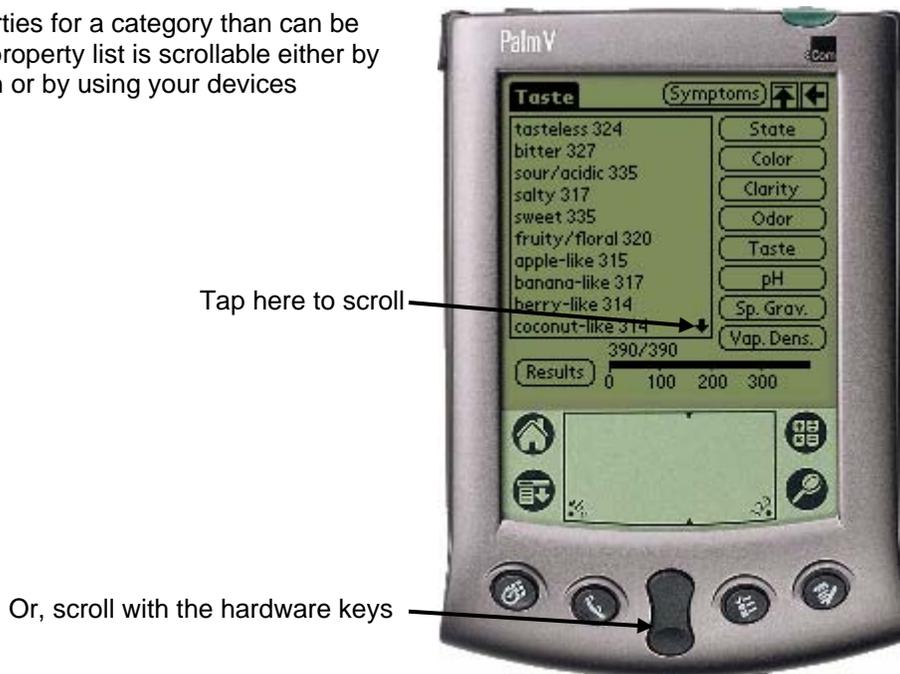
At the top is a **Symptoms** button that switches to the [Symptoms page](#) without having to return to the Identify Substance page.

The main content of the Properties Page is column of buttons representing the categories from which properties can be selected, and a list showing the current selections. The property categories consist of:

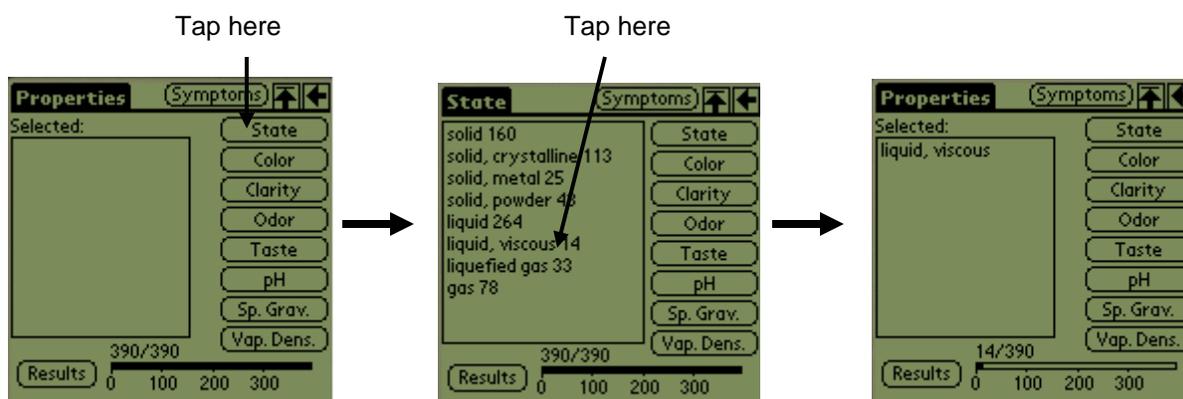
- State
- Color
- Clarity
- Odor
- Taste
- pH
- Specific Gravity (or Density)
- Vapor Density

Tapping one of the category buttons, such as 'State', displays a list of the properties in that category. Next to each property option is an indication of the number of substances having data that match that property AND each of the other property and symptom selections already made. Note that these numbers include substances that do not have sufficient data to determine whether or not there is a match. For example, in the odor category, the number displayed next to each odor option represents the number of substances that indicate that odor, plus the number of substances which don't have odor data, and thus it can't be determined if they have the odor. This follows the general philosophy that searches should err on the side of inclusiveness rather than exclusiveness, thus reducing the risk of the unknown substance being excluded from the search results.

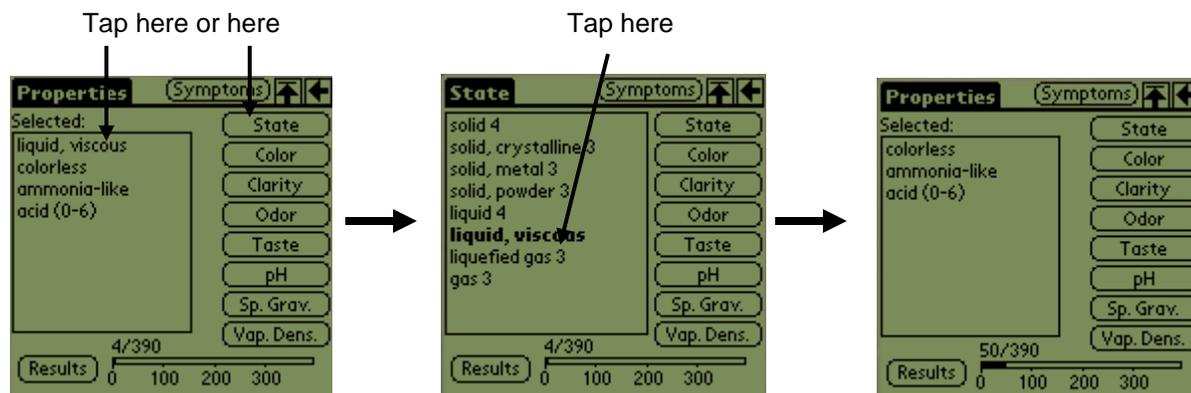
If there are more properties for a category than can be displayed at once, the property list is scrollable either by tapping the scroll button or by using your devices hardware scroll keys.



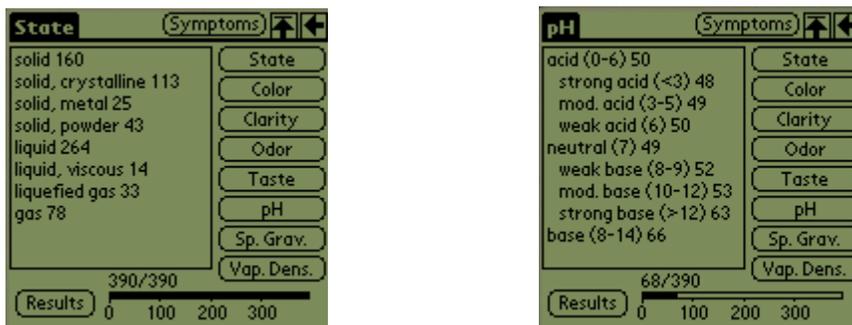
Following selection of a property, the **Selected** list on the Properties page updates to reflect the selection. The steps in selecting a property are shown below.



A property displayed in the **Selected** list can be tapped to return to the category that it was selected from, just as if the corresponding category button was tapped. The options in that category that are already selected are displayed with boldface type. Additional properties can be selected, or a boldface one can be tapped to deselect it. The following illustrates the **Selected** list following the selection of several properties, and demonstrates removal of one of those properties.



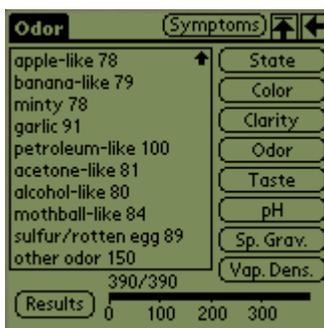
The following two property lists provide examples of related options, where one or more options are available that are more specific descriptions of a single more general option.



In the case of the State category, there is a 'solid' option, and then three additional solid options that are more specific, such as 'solid, crystalline'. The substances that will be matched by choosing the more general 'solid' option are inclusive of all the substances matched by one of the more specific options. If a more specific option is chosen, such as 'solid, crystalline', then selection of the more general 'solid' option is not necessary.

A similar situation exists for the pH category, where the broad ranges of acid and base can be selected, or a more specific ranges within those can be selected, such as "weak acid", "moderate acid", and "strong acid". In this case, indenting is used to help illustrate the relationships, and the names of the options are augmented with the numeric pH values that the named range applies to.

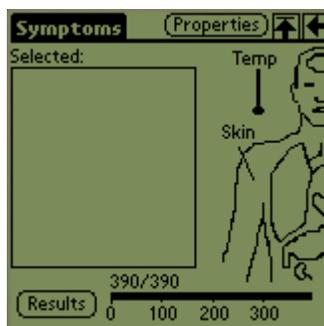
For the properties Odor and Taste, 'other odor' and 'other taste' options are available at the bottom of their respective property lists, as shown below.



The 'other odor/taste' options capture the substances that have an odor/taste, but not one that can be associated with one of the specific odors/tastes in the list. If you have odor or taste observations available, you should first examine the rest of the properties in the list, which begin with odorless/tasteless, and continue with specific odors/tastes. If a suitable match cannot be found, then resort to selecting the 'other' option at the bottom. ALL substances that include odor or taste data are included in the 'other' option; if a specific odor or taste is selected, then it would not be appropriate to also select the 'other' option.

### 3.3.3. Symptoms Page

To enter the symptoms of victims exposed to the unknown substance, navigate to the Symptoms page by tapping the **Symptoms** button on the [Identify Substance](#) page.



Like on the Identify Substance page, the progress bar at the bottom shows the number of matching substances based on the current symptom and property selections, and the **Results** button opens the [Search Results](#) page to display a list of those substances.

At the top is a **Properties** button that switches to the [Properties page](#) without having to return to the Identify Substance page.

The main content of the Symptoms page is an image of a human body whose major organs can be tapped, and which identify the categories from which symptoms can be selected. To the left is a list showing the current selections. The areas of the human body that can be tapped are shown below, with the names of the symptom categories to which they correspond (if different):

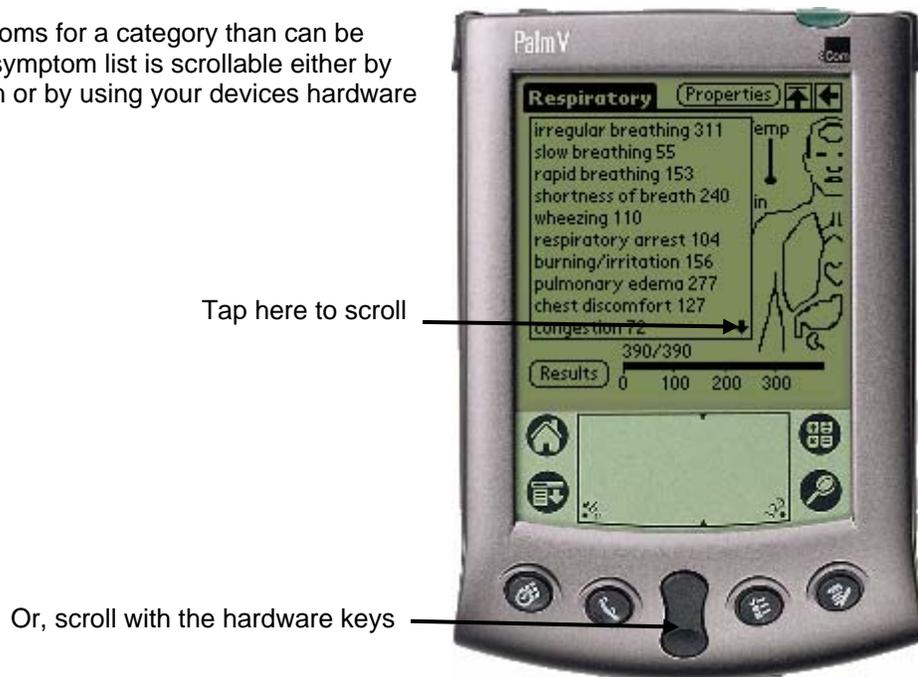
- brain (neurological category)
- eyes
- ears
- nose

- mouth and throat
- lung (respiratory category)
- heart (cardiovascular category)
- stomach/kidney (gastro/urinary category)
- arm (skin category)
- thermometer (body temperature category)

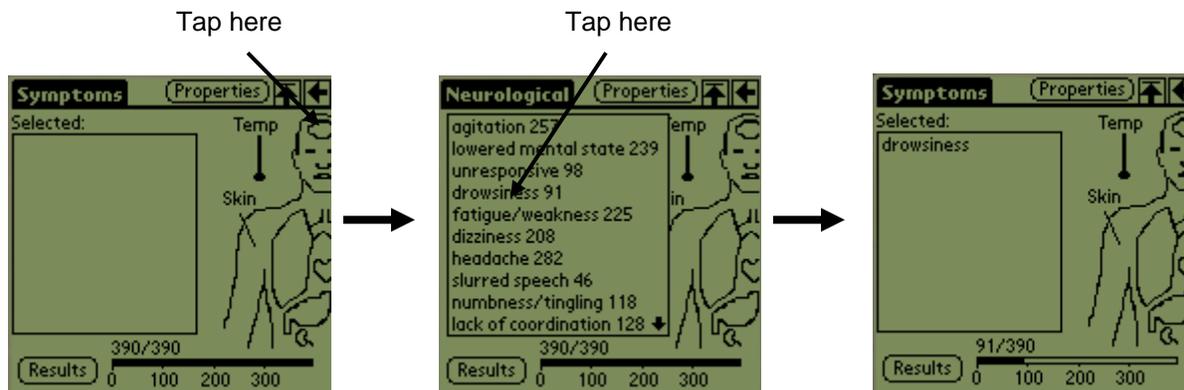
Tapping one of the above areas of the body, such as the brain, displays a list of the symptoms options in the corresponding symptom category, such as 'neurological'. Next to each symptom option is an indication of the number of substances having data that match that symptom AND each of the other property and symptom selections already made.

Note that symptoms are placed in the categories where they are observed. For example, "cyanosis/blue" is a symptom in the skin category. Cyanosis is not a skin symptom, but signs of cyanosis are evident in the skin. In addition, symptoms may occur in more than one category. Sneezing, for example, can be found both in the Nose and the Respiratory categories. When such is the case, selecting either one has exactly same effect on the search.

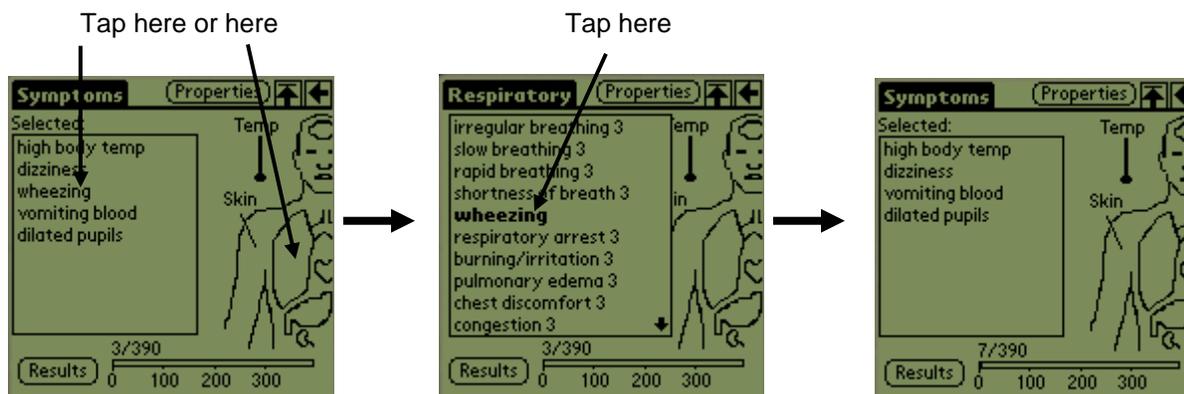
If there are more symptoms for a category than can be displayed at once, the symptom list is scrollable either by tapping the scroll button or by using your devices hardware scroll keys.



Following selection of a symptom, the **Selected** list on the Symptoms page is updated to reflect the selection. The steps in selecting a symptom are shown below.

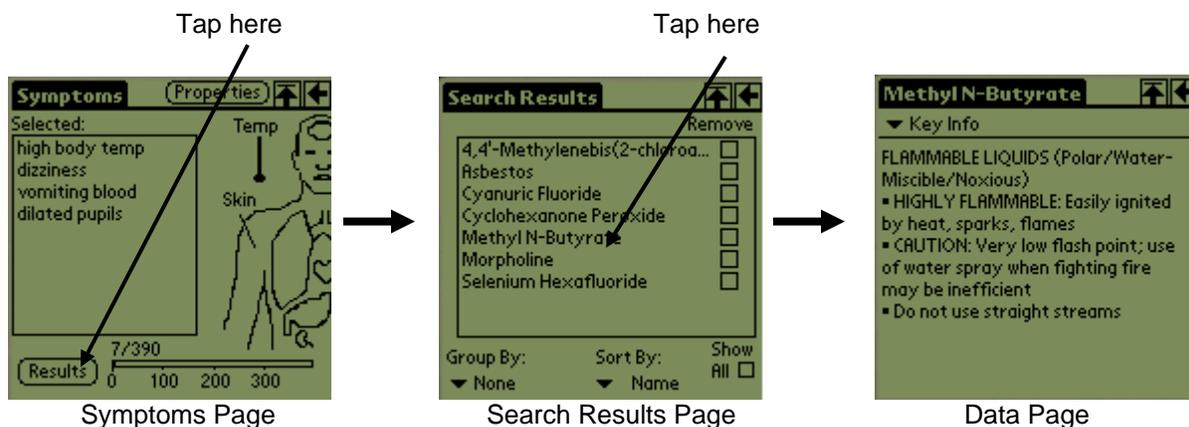


A symptom displayed in the **Selected** list can be tapped to return to the category that it was selected from, just as if the corresponding area of the body was tapped. The options in that category that are already selected are displayed with boldface type. Additional symptoms can be selected, or a boldface one can be tapped to deselect it. The following illustrates the **Selected** list following the selection of several symptoms, and demonstrates removal of one of those symptoms.

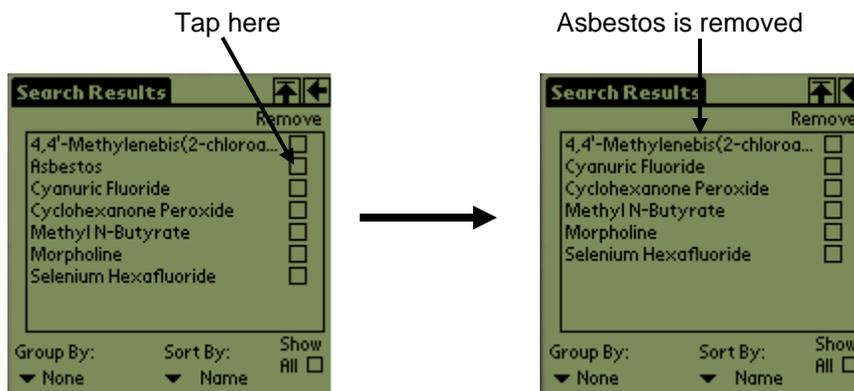


### 3.3.4. Search Results

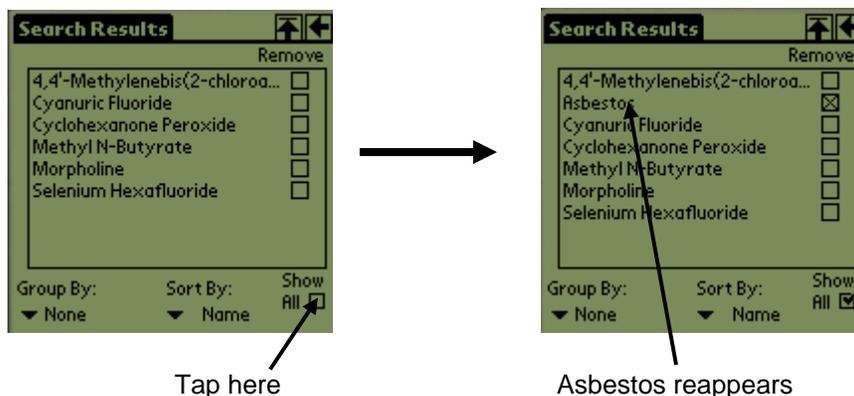
To display a list of the substances that match ALL of the properties and symptoms that have been selected during a search for an unknown substance, tap the **Results** button on the [Identify Substance page](#), [Properties page](#), or [Symptoms page](#). Tapping a substance in this list displays the [Data page](#), the same as selecting a substance from the [Main page](#).



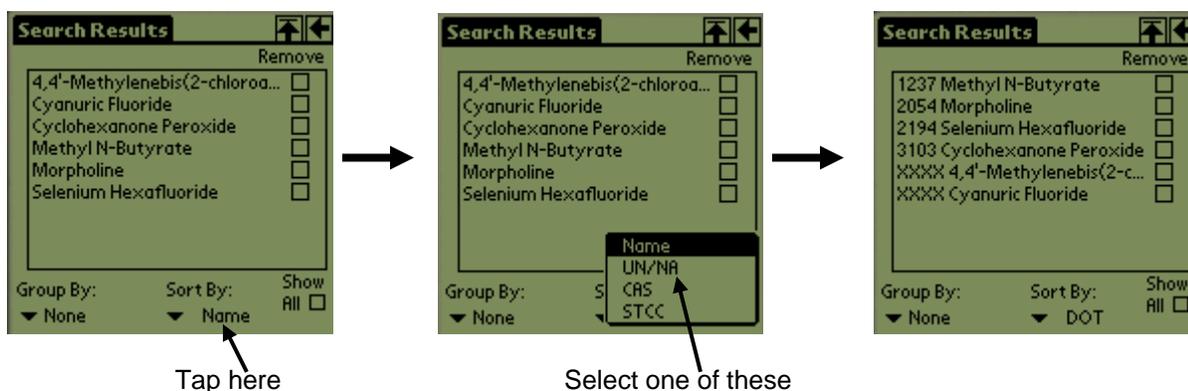
If a substance in the list is known to not be the unidentified substance, remove it from the results by tapping the checkbox following the substance name, as shown below.



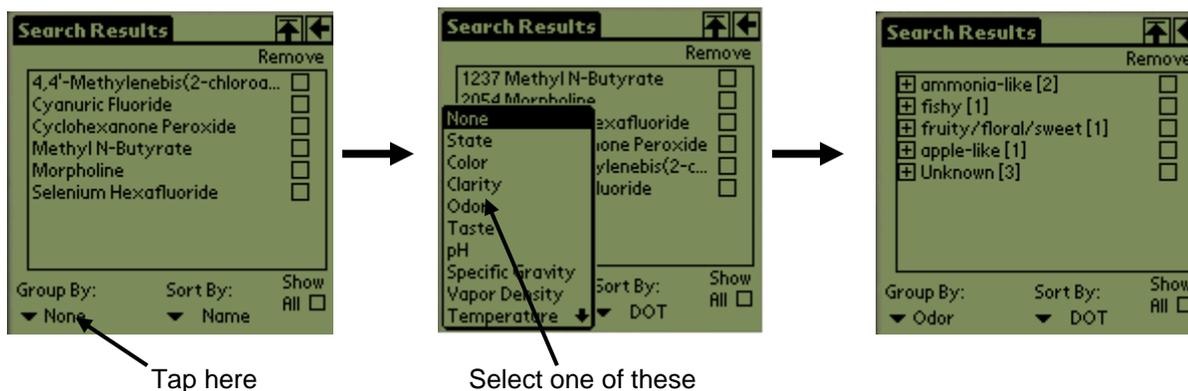
Any substances removed in this manner can be displayed again if the **Show All** checkbox is checked, as shown below.



The **Sort By** pull-down menu controls the ordering of the results list. By default, the list is sorted alphabetically by name. It can also be sorted by the following numbers: UN/NA, CAS registry, and STCC. When sorted by number, the substance names are prefixed with the chosen number type. If a substance does not have the selected number assigned, 'X' characters are used as placeholders. In the following example, the results list is ordered by UN/NA number, but two of the substances do not have such a number.



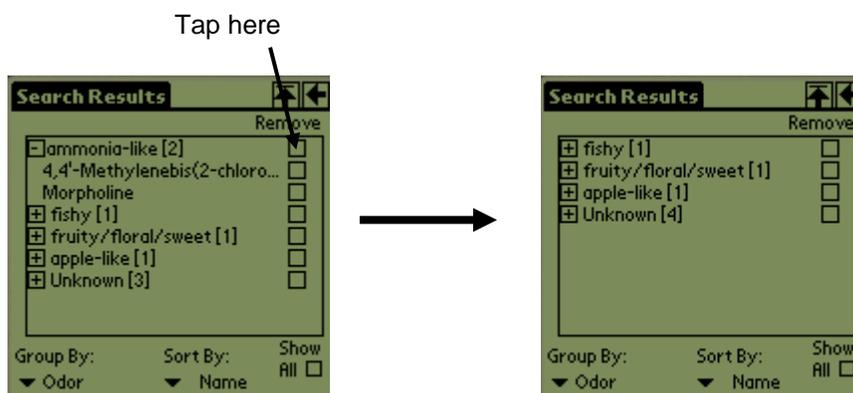
The **Group By** pull-down menu groups the substances in the list by one of the property or symptom categories. When a category from this menu is selected, the results list changes to a list of groupings by the properties or symptoms in the selected category. Each is followed by a number indicating how many substances are in the grouping. Grouping for properties or symptoms that do not contain any substances are not shown. The list of groupings may be augmented with an "Unknown" grouping. This contains the substances which do not have data for the corresponding symptom or property, and thus it is not known whether any of the symptoms or properties in the selected category apply.



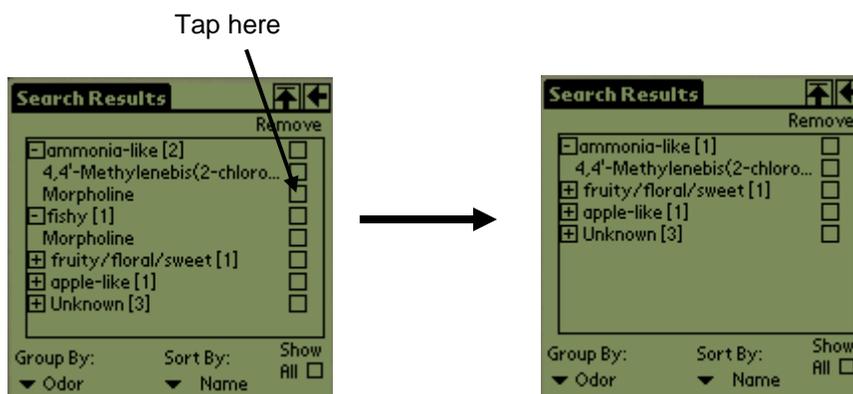
To view the substances within each grouping, expand the grouping by tapping the boxed "plus sign" to the left of the groupings. Tap again to contract.



In addition to removing substance, grouping can be removed as well. Removing a grouping removes all substances within that grouping, but they will still be visible in any other groupings in which they occur.



If a grouping is expanded and a specific substance removed, then that substance is removed from all groupings. In the following example, note that the removal of Morpholine not only removes it from the "ammonia-like" and "fishy" groupings, but also the "fishy" grouping itself is removed, since Morpholine was the only substance in that grouping.

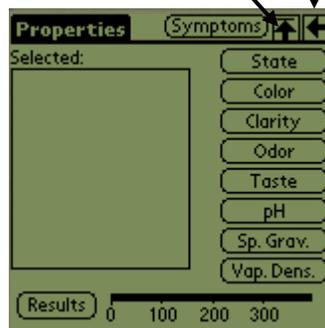


## 3.4. Miscellaneous

### 3.4.1. Navigation

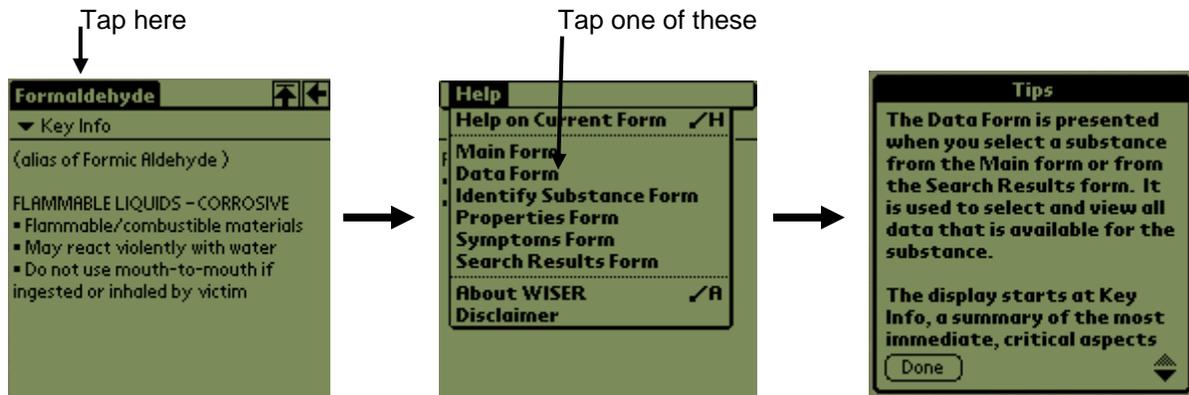
Except for the Main Page, each of the other WISER pages contain navigation arrows in the upper right corner. Tapping the “up-arrow” always returns you to the Main page. Tapping the “left-arrow” takes you back to the previous page you were viewing.

Tap here to return to Main Page      Tap here to return to previous page



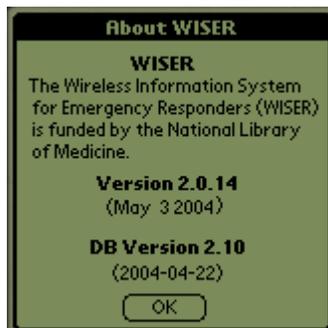
### 3.4.2. Help Menus

A help menu is available from the application menu bar, selected by tapping the page label on any page.



As shown above, the Help menu provides on-screen help for each of the displays in the WISER application.

The **About WISER** option in the help menu includes version information for both the WISER application and the database.

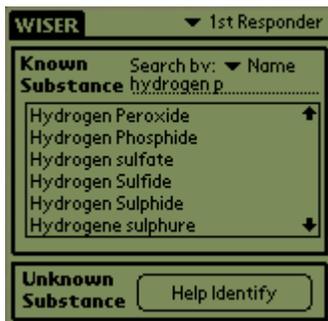


# 4. Tutorial

In this section, two scenarios are given as a tutorial for using WISER. In the first scenario, the substance is known; in the second, the substance is not known. WISER can be used in both of these scenarios to assist in responding to the incident.

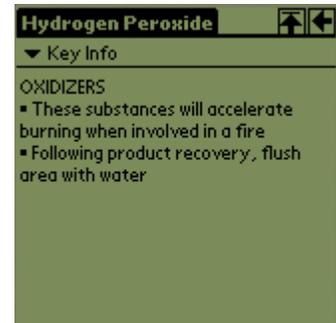
## 4.1. Known Substance

In this scenario, you are the first responder at a scene. There is an overturned cargo tank with 'Hydrogen Peroxide' on the side; the papers on board and 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 the hydrogen peroxide and may have ingested some of it.

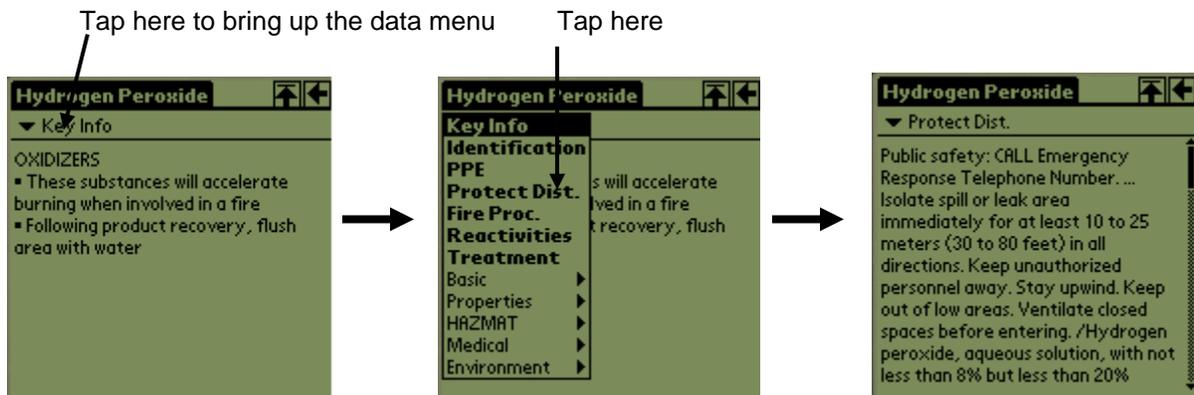


The immediate tasks are to clear out an appropriate area around the tanker truck, treat the driver, and correctly respond to the small fire. Using the WISER application, you can use Graffiti (the native Palm alphabet) to write an 'h' in the text field. The list of substances will scroll down to substances beginning with 'h'. Continue entering letters until hydrogen peroxide is visible in the list (or use your device's scroll buttons to advance the rest of the way).

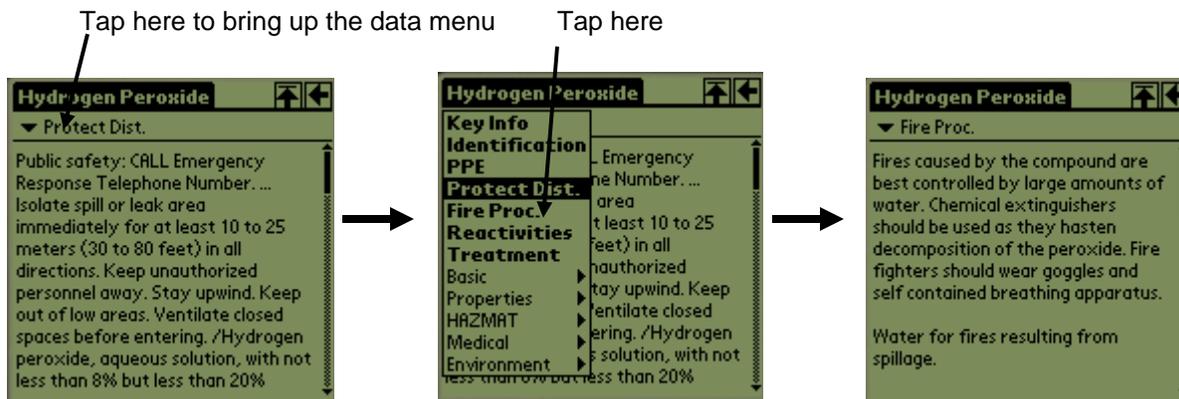
Tap on hydrogen peroxide. This will bring up the Data Form for hydrogen peroxide, showing the Key Info.



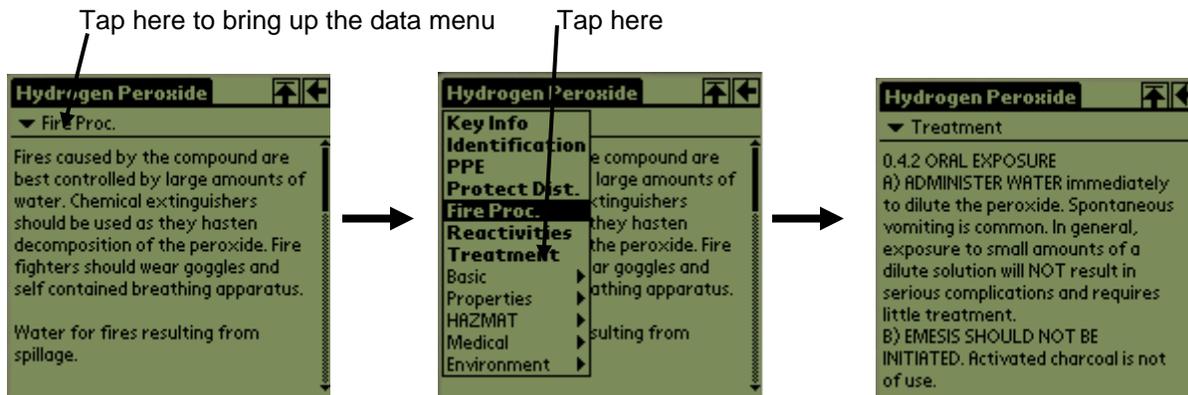
To determine the appropriate area to clear out, tap on the Protective Distance option in the data menu, as shown below. This brings up the Evacuation distance information from the DOT Emergency Response Guidebook (ERG). (The ERG is also accessible in its entirety by tapping the HAZMAT submenu.)



For information on the correct response to the fire, tap on the Fire Procedures hot link in the data menu, as shown below. (The fire procedures is also accessible from the HAZMAT submenu).



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



If more in-depth information is required, such as physical properties, it can be found by selecting the category of interest in the data menu, and then the desired data element from the resulting submenu. For example, to view information about decomposition, you select the category 'Properties' from the data menu, and then 'Decomposition' from the resulting submenu.

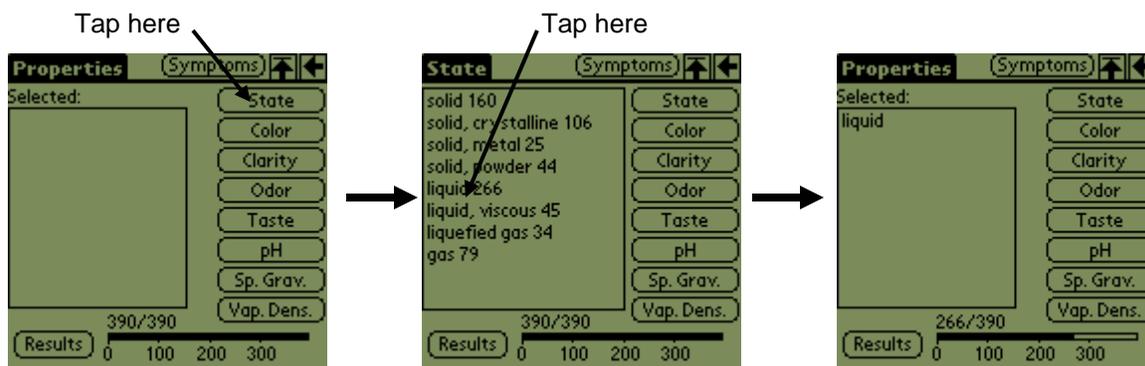
## 4.2. Unknown Substance

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.

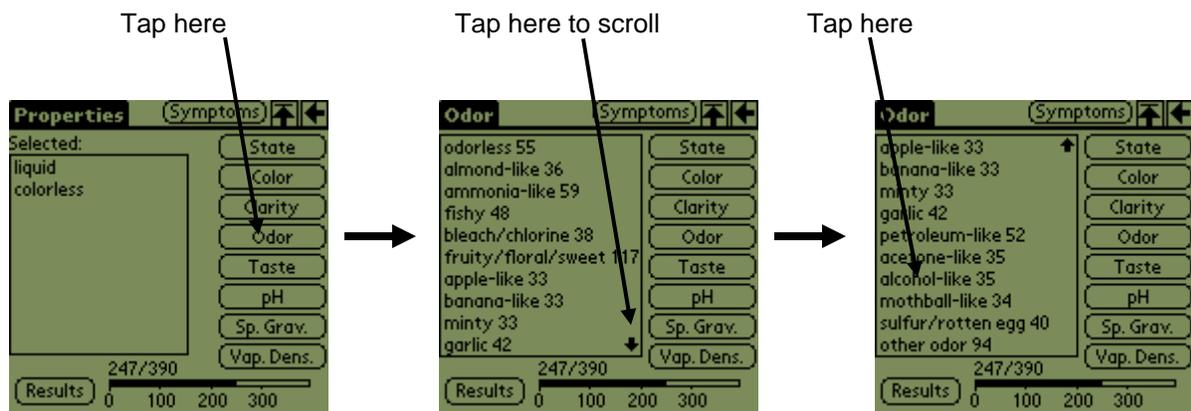
The substance in question has been leaking from an unmarked barrel. It has been described as a colorless liquid with an alcohol smell. The workers from the warehouse are showing the following symptoms: nausea, dizziness, headache, eye irritation, and low body temperature.

Using WISER in this situation, you tap on the **Help Identify** button on the Main form. If there is an existing search in progress, you should tap on **New Search** to save the search and clear out the symptoms and properties.

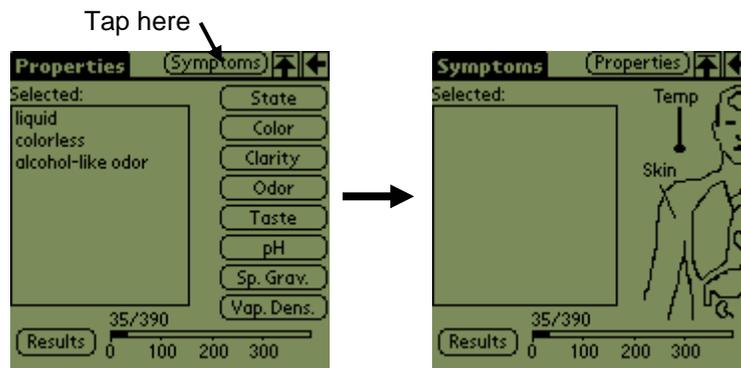
To enter the properties of the substance, first tap on 'State' to bring up the possible values of physical state and tap on 'liquid'. Liquid is now shown in the selected list and the number of matching substances has been reduced to 266 of the original 390.



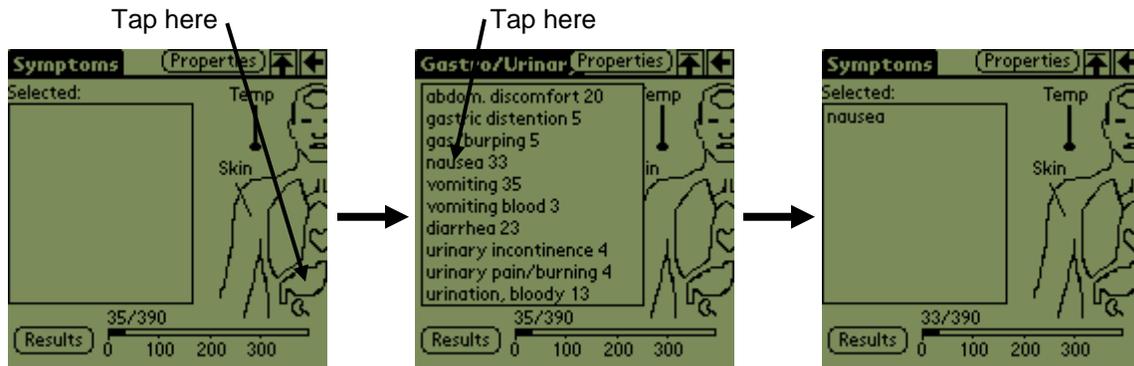
Then, following the same process, select colorless from the Color property and select 'alcohol-like' from the Odor property. For 'alcohol-like' odor, you might need to scroll to see that option in the list as shown below.



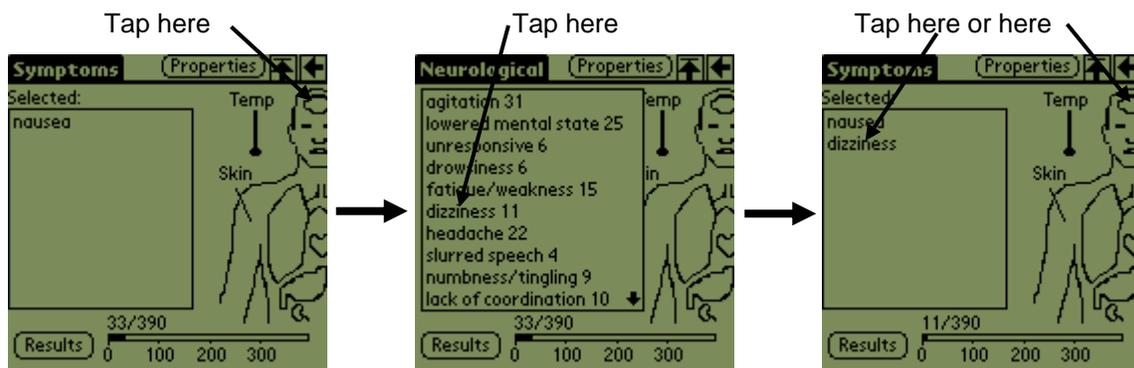
The result of using the properties liquid, colorless, and alcohol-like odor is that the original list of 390 substances has been reduced to 35. To enter victim symptoms, tap on the symptoms button at the top of the Properties page.

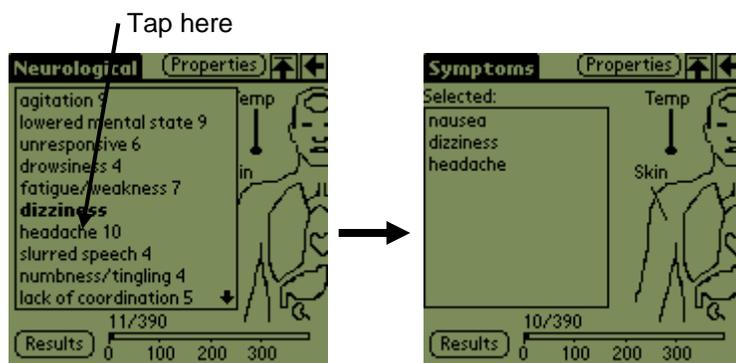


The symptoms (nausea, dizziness, headache, eye irritation, and low body temperature) are selected by tapping on the body part that shows the symptom. For nausea, tap on the stomach.

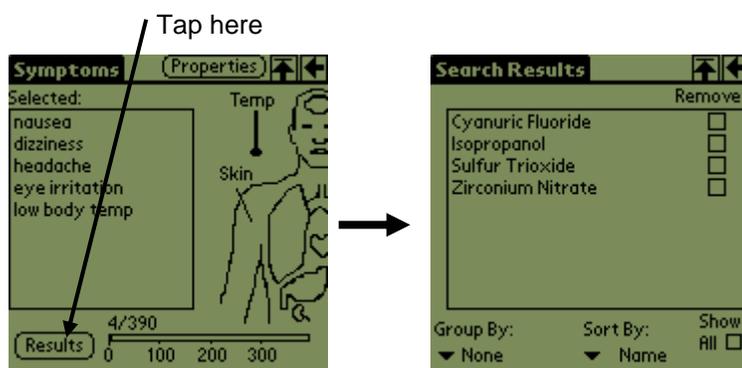


For dizziness and headache, tap on the brain. After dizziness has been selected, the neurological list can also be brought up by tapping on the dizziness symptom from the Selected list.

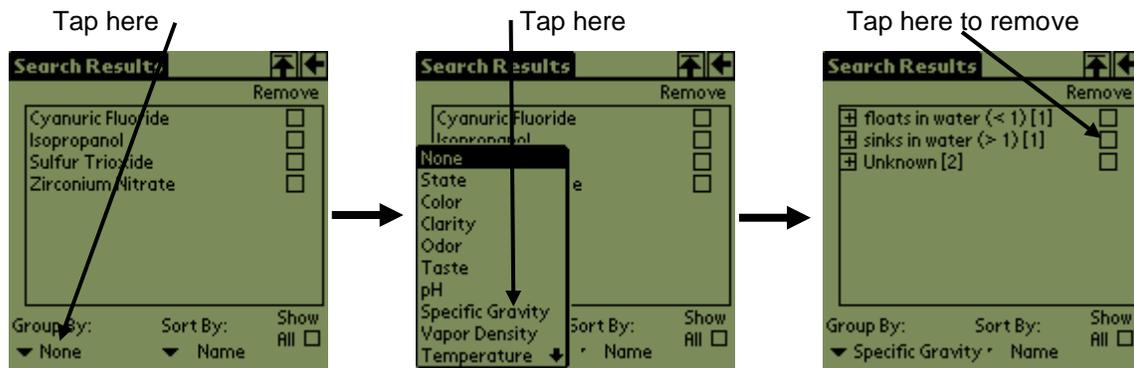




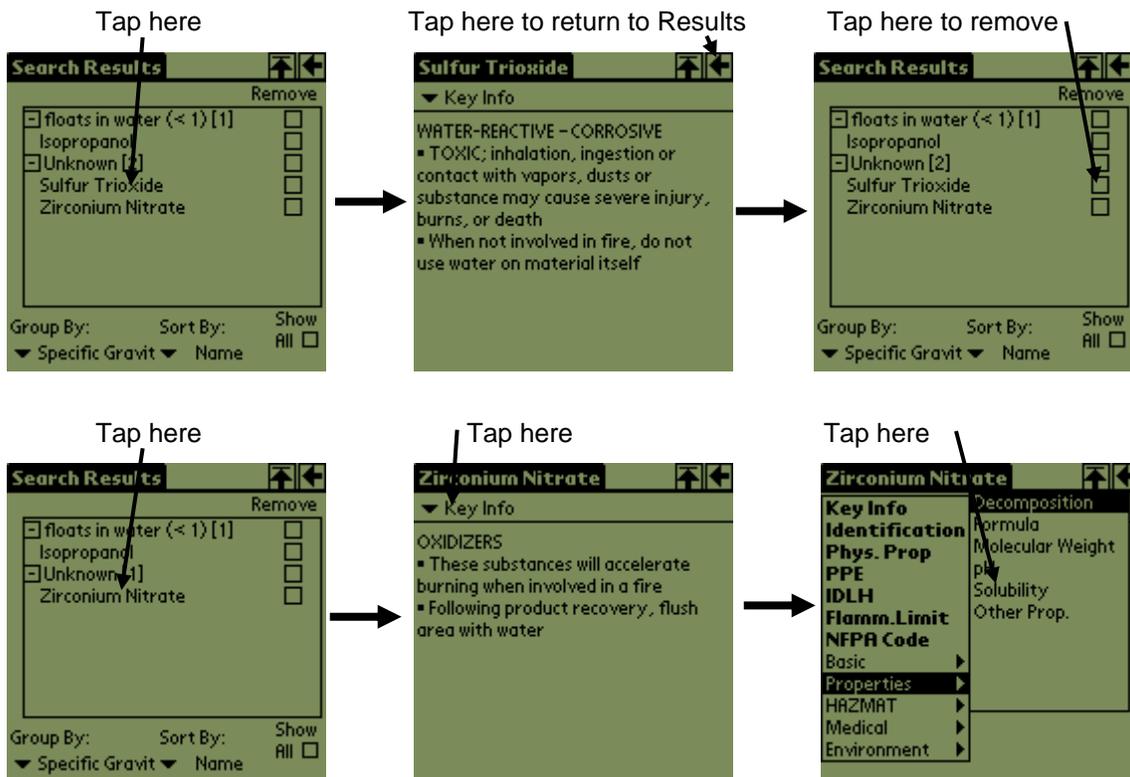
The symptoms of eye irritation and low body temperature are selected similarly. For eye irritation, tap on the eyes in the image of the human body. Then, tap on irritation. For low body temperature, tap on the image of the thermometer and then tap on low body temperature. The result of the symptoms, combined with the previously entered properties is shown below. To view the results of the search, tap on the Results button.

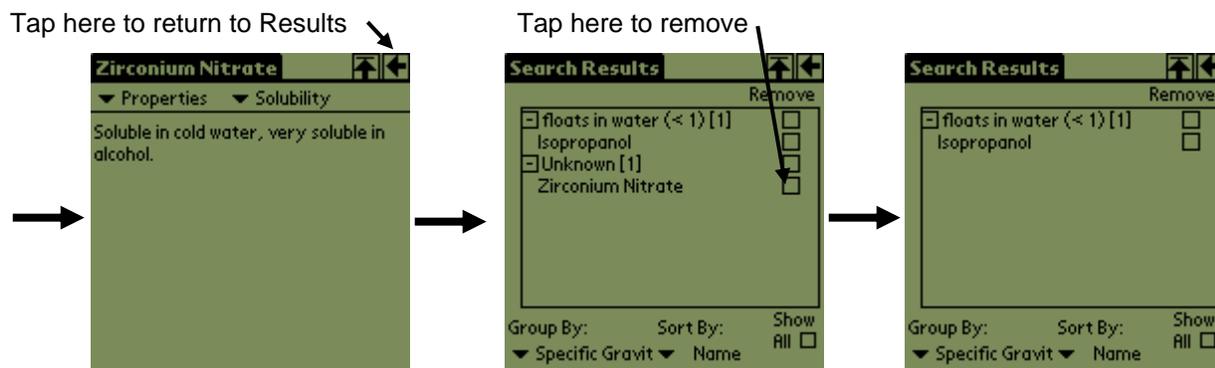


The result of the search to this point has resulted in 4 substances that match the symptoms and properties selected. To determine the correct substance, the Results page allows the user to group and sort the substance in different ways, remove substances that are known to be incorrect, and go to the Data pages for the substances. In this tutorial, the user groups by various symptoms and properties until getting to Specific Gravity, and that information is used to narrow down the substances even more. Here, the user taps on the Group-by button, and selects Specific Gravity. Based on the results of the grouping, the user tests the substance and observes that the substance is not soluble and floats on water. This information is used below. Since the substance is known to float, the sinks in water substance can be removed. This is done by tapping in the box to the right of the 'sinks in water' grouping.



The remaining substances need to be examined in more detail to determine the correct substance. First, examine Sulfur Trioxide. The Key Info indicates that it is water-reactive. Further investigation indicates that the melting point is 16.7° C (62.2° F) so at the current temperature, it should be a solid. It is likely that this substance can be removed. Next, examine Zirconium Nitrate. This substance is water-soluble and hence is unlikely to be the correct substance.





The final result of the search is Isopropanol. Information about this substance can be obtained by tapping on the name and using the Data form as described for known substances.



## 5. About NLM

The National Library of Medicine (NLM) is the world's largest medical library. The Specialized Information Services (SIS) Division of NLM is responsible for information coverage and services for several areas, including environmental health and toxicology, AIDS, and directories to other information resources concerned with health and biomedicine. SIS maintains the Hazardous Substance Data Bank (HSDB), covering over 4700 substances, their toxicology, emergency handling procedures, and environmental fate. The NLM is part of the National Institutes of Health, an agency of the U.S. Department of Health and Human Services.