WHONET Training Course

Module 2 – Laboratory configuration

Exercises

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**WHONET – Getting Started - Exercises**

The purpose of laboratory configuration is to describe to WHONET details about your institution and your laboratory test practices. This tutorial describes how to create a “new laboratory” from the very beginning.

Note: If you will be using BacLink, there is a short-cut to accomplish most of the following steps. See the BacLink tutorials for more information. The short-cut feature is called “Create a laboratory from a data file”, and can be found under the WHONET “File” menu option.

1. **Describing your laboratory**
   1. Double-click on the WHONET icon on your desktop to begin WHONET. You will see a list of laboratory configurations currently defined on your computer. Click on “New Laboratory” to begin.
   2. Define the laboratory characteristics
      * For “Country”, either select “World Health Organization” or the correct country for your laboratory.
      * For “Laboratory name”, enter “WHONET Training Course Hospital” or the correct name of your hospital or laboratory.
      * For “Laboratory code”, enter “WTCH” or the correct code for your hospital or laboratory.
      * For purposes of this training course, select either “Human” or “Human, animal, food, environment” depending on your interests.
2. **Selecting your antibiotics**
   1. Click on “Antibiotics”, and you will see a screen with all of the antibiotics defined in WHONET to the left, and an empty “local” list to the right.

* For “Guidelines”, choose “CLSI” or “EUCAST”.
* For “Test method”, choose “Disk”
* For the “Antibiotic”, choose “Ampicillin, 10µg”
* Then click on the “->” arrow in the middle of the screen to add this antibiotic to the local list on the right of the screen. (Alternatively, you could double-click on the antibiotic name.)
* You will now see the ampicillin test included in the local antibiotic list on the right of the screen with the code “AMP\_ND10” if you selected CLSI and “AMP\_ED10” if you have selected EUCAST. (WHONET uses the letter “N” to represent CLSI, which used to be known as NCCLS.). “D10” refers to “Disk diffusion with 10µg)
  1. Repeat the above steps for the below antibiotics

Disk diffusion, cefoxitin 30µg

Disk diffusion, ceftriaxone 30µg

Disk diffusion, ciprofloxacin 5µg

Disk diffusion, erythromycin 15µg

Disk diffusion, gentamicin 10µg

Disk diffusion, imipenem, 10µg

Disk diffusion, nitrofurantoin, 300µg for CLSI or 100µg for EUCAST

Disk diffusion, penicillin G, 10 units for CLSI or 1 unit for EUCAST

Disk diffusion, trimethoprim/sulfamethoxazole 1.25µg/23.75µg

Disk diffusion, vancomycin, 30µg for CLSI or 5 µg for EUCAST

* 1. Now change the “Test method” to “Etest” and add the following antibiotics.

Etest, ceftiaxone

Etest, penicillin G

Etest, vancomycin

* 1. Select one or more antibiotics and click on “Move up” and “Move down”. You will see that you can change the sequence of antibiotics to the order that you prefer. For the purposes of this exercise, the final order that you choose does not matter.

1. **Configuring your antibiotics**

The below steps are not required, but they are useful to make data entry more convenient for the user (“Antibiotic panels”) and more relevant for the analysis of multidrug resistance (“Antibiotic profiles”)

* 1. Antibiotic breakpoints: WHONET automatically uses the correct official CLSI and EUCAST breakpoints, so in most cases, there will be no need for you to change these yourself. However, if there are no official breakpoints for the antibiotic that you selected or if you disagree with the breakpoints used by WHONET, then you may wish to make some manual modifications.
* Click on “Breakpoints”, “Disk diffusion”. You will see all of the official breakpoints for the antibiotics that you have selected for disk diffusion. Depending on your response at the beginning of this exercise, you will either see “human clinical breakpoints” only or the “human and animal clinical breakpoints” and the “epidemiological cutoff values”. When you finish reviewing this screen, click on “OK” to return to the previous screen.
* Click on “MIC and Etest”. You will see all of the breakpoints for the antibiotics that you have selected for MIC or Etest. Click on “OK” to return to the previous screen.
* Click on “OK” again to return to the antibiotic list.
  1. Antibiotic panels: If you will enter results manually into WHONET, it would be useful to the data entry person if you indicate which antibiotics are tested for which organism groups. For example, for *Staphylococcus aureus*, the software should request results from drugs used in Gram-positive infections, while for *Escherichia coli* in urine samples, a different set of antimicrobials would be appropriate.
* From the Antibiotic configuration screen, click on “Panels”. For this tutorial, put checkmarks for the following organism groups and antibiotics.
* Staphylococcus sp.: cefoxitin, erythromycin, penicillin, and trimethoprim/ sulfamethoxazole
* Streptococcus pneumoniae: erythromycin, trimethoprim/ sulfamethoxazole, vancomycin, penicillin-Etest, and ceftiaxone-Etest
* Gram-negative. ampicillin, ceftriaxone, ciprofloxacin, gentamicin, imipenem, nitrofurantoin, and trimethoprim/sulfamethoxazole
* Click on “OK” when you are finished to return to the previous screen.
  1. Antibiotic profiles: This feature is used in the data analysis option called “Resistance profiles” to study multidrug resistance.
* From the Antibiotic configuration screen, click on “Profiles”. You will see that the resistance profiles for “Staphylococcus sp.”, “Streptococcus pneumoniae”, and “Gram negative” have automatically been populated, using the information that you provided above in “Panels”.
* Click on the row for “Gram negative” and “Edit”, and you will see the area where you can review, add, and remove antibiotics from the list of “Profile antibiotics” and “Supplementary antibiotics”.
* Nitrofurantoin is an antibiotic that is often tested only in isolates from urine samples. Use the “<-“ arrow button in the middle of the screen to remove nitrofurantoin from the “Resistance profile” list, and then use the “->” arrow button to add it to the “Supplementary antibiotics”.
* Click on “OK” to return to the previous screen with the resistance profile definitions.
* Click on “OK” again to return to the previous screen with the list of antibiotics.
* Click on “OK” again to return to the main screen for laboratory configuration.

1. **Sample locations**
   1. Location list. If you entry data manually into WHONET, it would be useful to enter a list of the most common locations from which your laboratory receives samples. This could include hospital (clinics, wards), animal (farms, markets, homes), food (markets, restaurants), and environmental (water sources, soil) locations. Alternatively, the location could also refer to higher-level locations such as city, state, or province.

* Click on “Locations”, and enter the below examples from the human health sector. You can leave the “Institution” and “Department” columns empty if they are not relevant.

**Location Code Institution Department Location type**

Neurology neuro wtcl med in

Cardiac Surgery csurg wtcl sur in

Neonatal ICU nicu wtcl neo icu

Diabetes clinic diab wtcl med out

Health Center #5 hc5 oth out out

Kinshasa kinsh out

Shanghai shang mix

In the above, wtcl = WHONET Training Course Laboratory, med = Medicine, sur = Surgery, neo = Neonatology, in = Inpatient, out = Outpatient, icu = Intensive care unit, mix = Mixed.

* Enter the below examples from non-human health sectors. Leave the “Department” and “Institution” columns empty since they are not relevant.

**Location Code Institution Department Location type**

Farmer Brown brown far

Newtown Veterinary Clinic nvc vet

McDonalds #5 mcd5 res

Blue River Site #10 blue10 env

In the above, far = Farm, vet = Veterinary clinic, res = Restaurant, env = Environment

* Click on “OK” to return to the previous screen.

1. **Data fields**

WHONET provides a standard list of data fields, such as “First name”, “Last name”, “Date of birth”, “Animal species”, “Specimen date”, “Specimen type”, “Organism”, and “ESBL”s. You have the ability to add and remove data fields to match the information needs for your laboratory.

* 1. Data field list
* Click on “Data fields”. You will see the list of WHONET data fields.
* Select a field from the list on the left and click on “Move up” and “Move down” to see how it is possible to change the sequence of data fields. For purposes of this tutorial, the final sequence is not important.
* You can see field characteristics, such as “Field type” (“Text” or “Date”) and “Field length”. For example, if you click on “First name”, you see that the field length is 30 characters. You can change this if desired.
* You can also see whether a field is intended for “Human”, “Animal”, “Food”, and/or “Environmental” samples, as well as the “Data entry” section, such as “Origin”, “Location”, “Specimen”, and “Microbiology”.
* There is a checkbox labeled “Isolate listing”. If the field is checked (for the most important fields), then you will always see this field in “isolate listings”. If it is not checked, then it will be hidden by default, but you will have the ability to click “Show hidden columns” to see it.
  1. Modifying the data field list
* Click on “Modify list”, and you will see the list of data fields available within WHONET on the left and the local list of data fields for your laboratory on the right.
* You can add additional fields to the list or remove fields that you do not need for your work. For this tutorial, click on “Clinical information” as the “Data category” and “Diagnosis” in the “Data fields” list. Use the right-arrow key to move “Diagnosis” to your laboratory’s field list on the right.
* If you cannot find a field that you need, you may also define a “User-defined field”.
* Click on “OK” to return to the previous screen. You could then use “Move up” and “Move down” to move “Diagnosis” to a different place on the list of data fields.

5.3 Code lists

If you add additional fields to your list, you may also wish to create a list of codes to use for these fields.

* Click on the data field for “Diagnosis” that you just added in the previous step.
* Click on “Code list"”. You will see options for “No code validation”, “Use codes from the table below”, and “Use codes from a file”.
* Click on “Use codes from the table below”, and introduce the following entries

**Description Code**

Pneumonia pneumo

Urinary tract infection uti

Meningitis mening

* When you finish, click “OK” to return to the previous screen.
* When you finish, click “OK” again to return to the main configuration screen.

1. **Microbiology alerts**
   1. List of microbiology alerts

* From the main configuration screen, click on “Alerts”. You will see a long list of microbiological alerts suggested by WHONET.
* Use the filters to view different types of rules, such as priority level (“High”, “Medium” and “Low” or alert type (“Important species”, “Important resistance”, “Quality control”, and “Therapy comment”.
* All of the WHONET rules are marked as “Active rule”, but for rules that are not important in your settings, then you can remove the checkbox to make this rule inactive.
* You can also use “New rule” to define additional alerts specific to your institution or country.
* When you finish reviewing or defining rules, click on “OK” to return to the main configuration screen.

1. **Finishing laboratory configuration**
   1. You have now finished your laboratory configuration. On the screen, you will see that the name of the configuration file has the form “LABXXX.YYY” where “XXX” refers to the country code and “YYY” refers to the laboratory code. For example, in this tutorial, the laboratory configuration would have the name “LABWHO.WTCL”.

* Click on “Save”, and this will save all of the information that you have entered in this tutorial into a file. It will also close the configuration screen, bringing you to the main menu.
  1. Modifying the laboratory configuration

At some point, you will probably want to return to the configuration area to add more antibiotics, locations, data fields, or alerts.

* On the main menu, click on “File” and “Modify laboratory”. You will now be back in the configuration area. You can review and modify the information that you have entered for the antibiotics, locations, data fields, and alerts. When you are finished, click on “OK” or “Cancel” to return to the main menu.
* Alternatively, you can leave WHONET, and then start WHONET again. You will see the new laboratory that you created in this exercise. Click on it, and then click on “Modify laboratory”. Then click on “OK” or “Cancel” when you are ready to continue to the main menu.

7.3 End of the exercise

* When you finish the exercise, you can then exit out of WHONET or you can continue with the exercises for data entry.