HIV drug resistance and resistance tests

When you take meds to treat your HIV disease, you’ll work closely with your doctor to check your progress over time and correct problems that may arise. One of the more important ones to be aware of is the issue of HIV drug resistance, which is one of the most common reasons why therapy fails. And although that may sound troubling, we actually know a lot about how to best avoid drug resistance and what to do should it appear.

Getting resistance tests is now routine care. If you haven't started therapy yet, then getting a resistance test before you start will help alert you and your doctor to possible resistant HIV. (Between 6–16% of people will get HIV that’s resistant to at least one HIV drug. Between 3–5% can get a strain that’s resistant to 2 or more meds.) And while you’re taking therapy, routine resistance tests will help inform you and your doctor which of your meds is suppressing HIV as well as it can and which is not.

What is drug resistance?

Simply put, resistance happens when HIV is able to change its own genes enough to avoid the effects of HIV drugs. Even though meds can suppress HIV to low or undetectable levels, the virus can still reproduce in small amounts. This allows HIV to change, or mutate, even when there’s drug present in the blood. HIV easily mutates and can reproduce rapidly, so a person may have different strains of HIV in his or her body at the same time.

Many mutations actually “weaken” HIV, allowing the drugs to control it more effectively. But it’s the mutations that specifically make HIV more resistant that are the ones to be concerned about. For most people who take their regimens properly, these mutations normally take a few years to develop. (The recent UK CHIC study reported that about 1 out of 5 people on treatment over 8 years developed some level of resistance to their drugs.)

If enough mutations occur, then you’ll probably need to change one or more of the drugs in your regimen. For some people, enough mutations happen in a shorter amount of time, causing them to change regimens more often.

Another issue to consider is that if HIV becomes resistant to one drug, it can be resistant to some of the other drugs in the same class of HIV meds. This is called cross-resistance. For example, if HIV is resistant to the NNRTI called Sustiva (efavirenz) then it’s highly likely that two of the other NNRTIs — Viramune (nevirapine) and Rescriptor (delavirdine) — can’t be used because of cross-resistance. This is one main reason why keeping resistance from happening in the first place is important … so that you don’t lose too many HIV drugs to choose from over time.

What is resistance testing?

You’ll get resistance tests done through regular blood draws. A lab will test the blood to show whether your virus can be suppressed by each HIV drug, and two types of tests are available. Genotypic tests look for those mutations in HIV’s genes that are already known to lead to drug resistance. Phenotypic tests assess how much of which drugs can stop HIV growing in a lab. To get an accurate result, you should be taking HIV drugs and have a viral load of 1,000 copies or more. Results from resistance tests will help you and your doctor figure out what’s the next best regimen to take and which drugs you may need to avoid.
HIV drug resistance and resistance tests

What are genotypic tests?
Because of the amount of research that’s been done on HIV meds over the years, we know which genetic mutations in HIV can cause it to become resistant. A common mutation called M184V can make HIV resistant to 3TC and other NRTIs. Another called L90M can lead to some resistance to most protease inhibitors. Some drugs take only 1 or 2 mutations before HIV becomes resistant to them while others can withstand different patterns of mutations before they no longer work.

Genotypic tests will identify which of these mutations are present, if any, and at what level. You may see only a couple of low-level mutations, which would likely not result in having to change your regimen. Or, you may have several high-level mutations that may mean certain drugs aren’t working anymore. Also, a significant mutation that does not cause resistance by itself could lead to resistance when combined with other mutations.

Genotypic tests are less expensive but still cost $300–$600. They’re more widely available and results usually return within a week or two. However, these tests may also need experts to interpret the results. The tests cannot detect minor resistant strains of HIV if they’re present. Getting tests done at the same lab each time will help ensure accurate results over time.

What are phenotypic tests?
Phenotypic tests measure the amount of drug needed to suppress the growth of HIV in a lab. Here, copies of your HIV are exposed to different amounts of an HIV drug to see when it stops the virus from reproducing. Resistant HIV will need higher levels of the same drug to stop its reproduction. Phenotypic tests are generally more sensitive, so they may be able to find even low amounts of resistant HIV that genotypic tests miss.

Getting results from phenotypic testing is time-consuming since they’re done one drug at a time, so it’s also a more expensive test to get results from. Although the results are easier to interpret, it can take several weeks to get them. Since the test is not as routinely used as genotypic tests are, then it may be difficult to find a lab that does it.

www.projectinform.org
Go online around the clock and get connected to treatment information in the privacy of your own home!
HIV drug resistance and resistance tests

Making decisions with resistance test results

Studies show that using resistance test results to guide treatment decisions result in better health outcomes. This applies to both genotypic and phenotypic test results.

Although using resistance test results can help make better treatment decisions, they should be considered with other information such as your CD4 count and viral load, and the trends of both. It’s important to weigh the significance of resistance test results when deciding on what therapy to use, but this can be difficult to do.

All of this underscores the importance of getting regular resistance tests done when the situation calls for them and consulting an expert if that’s needed. Treatment decisions should also take into account your choice for treatment, possible side effects of the drugs, and keeping your future options open.

What can help to ask my doctor?

• How do I make sure I keep HIV from becoming resistant?
• What do you want me to tell you about how I’m doing on my regimen?
• How am I doing with my current regimen as far as resistance goes?
• What are the signs that tell us resistance is becoming a problem?
• Do you have experience in interpreting results from resistance tests?

Some final thoughts

The January 10, 2011 edition of the federal Guidelines recommends using genotypic tests in people who are newly diagnosed and in those on their first or second regimens. They recommend using phenotypic tests when there’s a complex drug resistance pattern, particularly to protease inhibitors.

Using these tests has helped many to live more healthful lives, but they do have some limitations. One, they must be done while you’re on therapy, so if you’ve stopped or changed regimens the tests won’t be able to identify resistant virus from your earlier regimen. Resistance tests also can’t predict the failure of a regimen in people who are currently doing well on therapy. Next, their cost may prevent some people from being able to get them done. And, just because a result may show there isn’t resistant virus in the blood, it doesn’t mean that it’s not elsewhere in the body, such as in semen or spinal fluid.

The main way to prevent drug resistance in the first place is by keeping up with your HIV meds, but taking them as prescribed every day takes effort. At times, it can be smooth sailing for many people without much interruption to their daily lives. But other times it may be more problematic to take every dose properly. For more information, read Project Inform’s publication, Adherence: Keeping up with your meds. For more specific information on HIV mutations, go to www.iasusa.org/resistance_mutations or http://hivdb.stanford.edu.