

October 20, 2009

Information on Testing for Influenza Antiviral Resistance

Antiviral resistance testing will be of limited use for the care of most patients due to the limitations of testing described below. However, certain patients may benefit from antiviral resistance testing.

Background Information on Antiviral Testing: Comprehensive antiviral resistance testing includes the neuraminidase inhibition assay to detect resistance to oseltamivir or zanamivir followed by sequencing or pyrosequencing to detect mutations associated with the resistance. Resistance to adamantanes can be deduced by sequencing or pyrosequencing to detect well established mutations that have been shown to be responsible for resistance.

Currently, comprehensive antiviral resistance testing (neuraminidase inhibition assay, pyrosequencing, and sequencing) is performed by CDC for national surveillance, as well as by a few research laboratories. Neuraminidase inhibition assay requires a virus isolate. Pyrosequencing can be performed on clinical specimens, and thus will provide results within 2-4 days. Pyrosequencing or sequencing of the neuraminidase may be used to detect the H275Y mutation that is associated with oseltamivir resistance of seasonal H1N1 viruses and rare cases of resistance in 2009 H1N1 influenza viruses; *however sequencing or pyrosequencing will not detect oseltamivir resistance due to mutations other than H275Y nor zanamivir resistance.*

A few public health laboratories, in addition to CDC, have pyrosequencing or sequencing capabilities to detect the H275Y mutation for surveillance purposes, or additional antiviral testing capacity. Check with your local or state public health laboratory to determine their antiviral testing capabilities.

Testing Specimens for Patient Care: Due to the delay in receiving results, antiviral resistance testing will be of limited use for the care of most patients. However, certain patients may benefit from antiviral resistance testing, including patients with either a severe immunocompromising condition, or patients in an ICU, plus: no sign of clinical recovery despite a 5 day course of antiviral therapy, and documentation of persistent influenza A positive diagnostic tests. For most patients pyrosequencing will be adequate. However, comprehensive antiviral testing (neuraminidase inhibition assay, pyrosequencing, and sequencing) is suggested for patients with severe immunosuppression. Also, patients who developed influenza while on antiviral chemoprophylaxis may benefit from antiviral resistance testing.

CDC will consider requests to test specimens from patients for antiviral resistance on a case-by-case basis. Requests for antiviral resistance testing should be directed to the state laboratory or to CDC Emergency Operations Laboratory desk at: eoclaboratory@cdc.gov. Failure to get appropriate forms for submission could delay testing.

Note: Antiviral resistance testing at CDC only occurs Mon-Fri and specimens can only be shipped to CDC on Mon-Thursday. The sender should notify the state laboratory and CDC before shipping.