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Medical Focus - Avian Flu Essentials

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"Responsibility is to keep the ability to respond." – Robert Duncan

Dear Colleague:

In the eighth letter in the Avian Flu Essentials series, I will describe quick diagnostic testing and the pre-positioning of supplies.

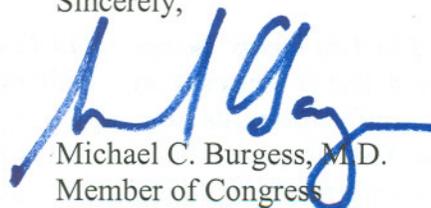
Rapid identification of virus types and strains is vital to controlling a pandemic. Currently, many laboratory tests are available to detect influenza viruses. However, not every facility can determine the exact strain of a virus. Consequently, samples must be shipped to designated labs or the CDC. These sites operate at the appropriate biocontainment level to ensure that lab workers are protected from the virus and own the equipment to carry out Reverse-Transcription Polymerase Chain Reaction (RT-PCR). This technique is used to determine the exact viral antigens (H and N) on the sample.

Based on this, rapid diagnostic tests become valuable while samples are mailed to confirm emerging pandemic influenza cases. The accuracy of these tools is not one hundred percent, but they can aid health care workers in choosing appropriate treatments while they await the results. Important characteristics to consider for these tests are their cost, result timeframe, and breadth of viruses they can recognize. Several emerging rapid diagnostic tests are listed on the reverse of this letter.

A pandemic has the potential to severely disrupt a nation's daily activities, so the pre-positioning of supplies is crucial. First, an outbreak can be controlled more rapidly if health care workers have ready access to antiviral treatments and administer them within 48 hours of diagnosis. Second, the ability to move supplies can be hindered by reductions in the workforce. Therefore, federal, state, and local communities need to increase their coordination efforts to designate accessible sites across the United States to store medical supplies, vaccines, and treatments.

Rapid diagnostic tests and available supplies can be the determinants in whether an outbreak is contained. New diagnostic tests should be reviewed and incorporated in preparedness plans.

Sincerely,



Michael C. Burgess, M.D.
Member of Congress

Excerpt from ABC News, *Firm offers test to detect avian flu virus*

CHICAGO, Nov 3 - Quest Diagnostics Inc. on Thursday said it has developed a test to detect the avian flu virus and will participate in the government's preparedness efforts. Quest said it has notified physicians and hospitals that it has begun to offer a gene-based screening test to identify the H5N1 strain of Influenza A virus, the virus that is responsible for causing "avian flu" in birds and some humans in some parts of the world. Testing is performed on respiratory samples, which include sputum, swabs and bronchial washes.

Excerpt from China View, *Chip designed for quick flu identification*

LOS ANGELES, Nov.7 (Xinhuanet) -- A novel "Flu Chip" has been developed to determine the genetic signatures of specific influenza strains from patient samples within hours, US scientists reported on Monday. This achievement, expected to be in use in laboratories within a year, may help world health officials combat the predicted flu epidemics by making it easier for more laboratories to swiftly identify severe flu strains, the researchers said. Scientists from the University of Colorado at Boulder, who invented this Flu Chip, also planned to make the genetic sequences of different flu strains freely available to interested researchers.

Tests by US Centers for Disease Control and Prevention (CDC) showed this Flu Chip can determine the genetic make-up of types and subtypes of the flu virus in about 11 hours, while current methods for characterizing flu subtypes take about four days, said Kathy Rowlen, a professor who led this research.

The chip, which can be configured to test for all known flu virus strains as well as new variant strains, was evaluated for three primary subtypes of flu, including the highly pathogenic avian flu strain H5N1, and two of the most common human flu types worldwide in recent winters, H1N1 and H3N2. The chip was more than 90 percent accurate and will be tested again "side by side" with standard flu-virus culturing methods for accuracy and speed at the CDC next month, Rowlen said.

The Flu Chip fits on a microscope slide and contains an array of microscopic spots. Genetic bits of information that are complimentary to known, individual influenza strains are "spotted" robotically in an array, where each row of three spots contains a specific sequence of "capture" DNA. The microarray is then immersed in a wash of influenza gene fragments obtained from the fluid of an infected individual. RNA fragments from the infected fluid bind to specific DNA segments on the microarray like a key in a lock, indicating both a match and that the virus signature is present, Rowlen said. Then the captured RNA is labeled with another complimentary sequence that also contains a fluorescent dye, and such "hits" light up like a pinball machine when the chip is inserted into a laser scanner.

Excerpt from MediaCorp, *Singapore biotech firm licenses rapid avian flu test kits, November 11, 2005*

Two new test kits, which can detect the presence of bird flu in humans and birds in just 10 minutes, will soon be commercially available in Singapore. Rockeby Biomed Corporation, a local biotechnology company, launched the kits on Friday. The test kit for birds, the first of its kind in the world, relies on faeces, blood or serum samples. As for the human test kit, swabs are taken from the nose or throat and tested. The test kit for birds costs about US\$6 and the one for humans about US\$10 to US\$12.

Excerpt from Medical News Today, *Rapid Flu Test Helps Target Avian Flu, November 14, 2005*

A rapid test for the detection of influenza type A and B viruses is now available from Oxoid Limited. Xpect™ Flu A & B detects and distinguishes the type A influenza virus from type B in just 15 minutes, and with 100% specificity, directly from nose or throat swabs. This simple lateral flow test is extremely easy to perform and interpret, giving virologists quick and valuable information with which to target further investigations and patient care. For samples that may require transportation, a wide variety of transport media are suitable. Furthermore, samples can be refrigerated and tested within 72 hours or frozen at -20°C or below and tested within 6 months.