Virginia Department of Health

Emergency Operations Plan

Attachment
Pandemic Influenza

Revised 06-30-2005

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment
www.vdh.virginia.gov

Table of Contents

I. Purpose

This attachment to the Virginia Department of Health (VDH) Emergency Operations Plan addresses how to respond to specific situations, as they relate to pandemic influenza. The VDH Office of Epidemiology is responsible for periodically reviewing and updating this plan to ensure that information contained within the document is consistent with current knowledge and changing infrastructure.

Priorities of VDH during pandemic influenza will be to assure the continuation and delivery of essential public health services while providing for the emergency needs of the population. The appendices of this document contain specific guidance and handouts for pandemic preparedness. Appendix C: *Influenza: Overview for Healthcare Providers,* Appendix D: *Influenza Infection Control* and Appendix E: *Influenza Antivirals: Overview for Healthcare Providers* will serve as guidance documents for physicians and medical personnel.

II. Situation and Assumptions

For planning purposes, the worst-case scenario is projected. If the situation does not fully develop, the response can be adjusted. The following assumptions are made:

A. An influenza pandemic will present a massive test of the emergency preparedness system. Advance planning for Virginia's emergency response could save lives and prevent substantial economic loss.
B. Although pandemic influenza strains have emerged mostly from areas of Eastern Asia, variants with pandemic potential could emerge in Virginia or elsewhere in the U.S.
C. Many geographic areas within Virginia and its neighboring jurisdictions may be affected simultaneously. Localities should be prepared to rely on their own resources to respond. The effect of influenza on individual communities will be relatively prolonged (weeks to months) in comparison to other types of disasters.
D. There may be critical shortages of health care resources such as staffed hospital beds, mechanical ventilators, morgue capacity, temporary holding sites with refrigeration for storage of bodies, and other resources.
E. Healthcare workers and other first responders may be at higher risk of exposure and illness than the general population, further straining the healthcare system.
F. Widespread illness in the community could increase the likelihood of sudden and potentially significant shortages of personnel in other sectors who provide critical public safety services.
G. Effective preventive and therapeutic measures (e.g., vaccines and antiviral medications) will be delayed and in short supply.
H. Assuming that prior influenza vaccination(s) may offer some protection, even against a novel influenza variant, the annual influenza vaccination program, supplemented by pneumococcal vaccination when indicated, will remain a cornerstone of prevention.
I. Surveillance of influenza disease and virus will provide information critical to an effective response.
J. It is likely that public health will take the lead in distributing influenza vaccine. Health departments will work in partnership with health care providers to facilitate distribution.
K. The vaccine will likely be administered under an Investigational New Drug (IND) protocol.
L. An effective response to pandemic influenza will require coordinated efforts of a wide variety of organizations, both public and private, and health as well as non-health related.

III. Coordination and Decision Making

The federal government is responsible for nationwide coordination of the pandemic influenza response. Specific areas of responsibility include the following:

- Surveillance and epidemiologic investigations in the U.S. and globally;
- Development and use of diagnostic laboratory tests and reagents;
- Development of reference strains and reagents for vaccines;
- Vaccine evaluation and licensure;
- Determination of populations at highest risk and strategies for vaccination and antiviral use;
- Assessment of measures to decrease transmission (such as travel restrictions, isolation, and quarantine);
- Deployment of federally purchased vaccine ;
- Deployment of antiviral agents in the Strategic National Stockpile;
- Evaluation of the efficacy of response measures;
- Evaluation of vaccine safety;
- Deployment of the Commissioned Corps Readiness Force and Epidemic Intelligence Service officers; and
- Medical and public health communications.

VDH will be responsible for coordination of the pandemic influenza response within and between jurisdictions. Specific areas of responsibility include:

- Identification of public and private sector partners needed for effective planning and response;
- Development of key components of pandemic preparedness, including surveillance, distribution of vaccine and antivirals, and communications;
- Integration of pandemic influenza planning with other planning activities conducted under the Centers for Disease Control and Prevention (CDC) and the Health Resources and Services Administration (HRSA) bioterrorism preparedness cooperative agreements;
- Development of data systems needed to implement components of the plan;
- Providing assistance to local areas in developing and exercising plans; and
- Coordinating with adjoining jurisdictions.

During an influenza pandemic, the VDH State Epidemiologist will be responsible for implementation of activities outlined in this attachment, under the direction of the Deputy Commissioner for Public Health and/or the Deputy Commissioner for Emergency Preparedness and Response. The Director of the Division of Immunization (DI) will be responsible for coordinating vaccine distribution through the State Pharmacy within the VDH Division of HIV, STD and Pharmacy Services. The Director of the Division of Surveillance and Investigation (DSI) will be responsible for coordinating enhanced surveillance methods for the detection of influenza and for facilitating investigation and control interventions. The Director of DSI and the Director of DI will report directly to the State Epidemiologist. The agency Public Relations Manager will be responsible for coordinating pandemic influenza media-related activities and will report directly to the Commissioner of Health.

This plan for responding to pandemic influenza will serve as an attachment to the VDH Emergency Operations Plan, which will address issues such as: command and control

procedures, legal authority, surveillance and epidemiologic investigation procedures, medication and vaccine management, intra- and interagency coordination, hospital and emergency medical services coordination, infection control, security, communications, and education and training. While this attachment serves as a guide for specific influenza intervention activities, during a pandemic the judgment of public health leadership, based on knowledge of the specific virus, may alter the strategies that have been outlined.

During a pandemic, if the vaccine is in short supply, the CDC and VDH will provide guidance on recommended priority groups for vaccination, as well as for the receipt of antiviral medications. Recommendations for priority groups for vaccination and receipt of antiviral medications will likely be based on: 1. Maintaining the ability to provide quality healthcare, implement pandemic response activities and maintain vital community services; 2. Protecting persons at highest risk for influenza mortality; 3. Decreasing transmission to those at highest risk for influenza mortality; and/or 4. Maintaining other important community services. [1]

VDH will also consider input and suggestions on priority groups from the VDH Pandemic Influenza Advisory Committee, a diverse group of professionals representing various interest groups, as well as public and private agencies across the state. Some issues that are currently being debated and addressed by the VDH Pandemic Influenza Advisory Committee are noted in Appendix A. Organizations represented on the advisory committee can be found in Appendix B.

IV. Phases of Pandemic Influenza

The World Health Organization (WHO) has defined phases of pandemic influenza that "address the public health risks of influenza infection in animals, link phase changes directly with changes in public health response, and focus on early events during a 'pandemic alert' period when rapid, coordinated global and national actions might help to contain or delay the spread of a new human influenza strain."[2] Identification and declaration of the stages outlined in Table 1 will be done at the national or international levels. Refer to Appendices F and G for a listing of activities that will be conducted during each phase of pandemic influenza.

Table 1. Pandemic Influenza Phases and Overarching Public Health Goals

Phase		Definition	Overarching Public Health Goals
Inter-pandemic period	1	No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection is considered to be low.	Strengthen influenza pandemic preparedness at the global, regional, national and subnational levels.
	2	No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk[a] of human disease	Minimize the risk of transmission to humans; detect and report such transmission rapidly if it occurs.
Pandemic alert period	3	Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.[b]	Ensure rapid characterization of the new virus subtype and early detection, notification and response to additional cases.
	4	Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.[b]	Contain the new virus within limited foci or delay spread to gain time to implement preparedness measures, including vaccine development.
	5	Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).	Maximize efforts to contain or delay spread, to possibly avert a pandemic, and to gain time to implement pandemic response measures.
Pandemic period	6	Pandemic: increased and sustained transmission in general population.[b]	Minimize the impact of the pandemic.

[a] The distinction between Phase 1 and Phase 2 is based on the risk of human infection or disease resulting from circulating strains in animals. The distinction is based on various factors and their relative importance according to current scientific knowledge. Factors may include pathogenicity in animals and humans, occurrence in domesticated animals and livestock or only in wildlife, whether the virus is enzootic or epizootic, geographically localized or widespread, and/or other scientific parameters.

[b] The distinction between Phase 3, Phase 4 and Phase 5 is based on an assessment of the risk of a pandemic. Various factors and their relative importance according to current scientific knowledge may be considered. Factors may include rate of transmission, geographical location and spread, severity of illness, presence of genes from human strains (if derived from an animal strain), and/or other scientific parameters.

V. Authority

Several sections within the Code of Virginia give the Board of Health and the State Health Commissioner the authority to perform certain acts to protect the health of citizens. Authorities that may be exercised during pandemic influenza are listed in Table 2.

Table 2. Code of Virginia Statute and Corresponding Authority

Statute	Authority
Reporting of Disease §32.1-35, 36, 37	• Requires reporting of selected diseases to the Board of Health by physicians practicing in Virginia and others, such as those in charge of a medical care facility. Immunity from liability for reporting is provided in §32.1-38.
Investigation of Disease, §32.1-39	• Authorizes the Board of Health to provide for surveillance and investigation of preventable diseases and epidemics, including contact tracing.
Authority to Examine Records, §32.1-40	• Authorizes the Commissioner or his designee to examine medical records in the course of investigation, research or studies. §32.1-41 **r**equires that the anonymity of each patient and practitioner be preserved.
Emergency Orders and Regulations §32.1-13; §32.1-20	• Authorizes the Board of Health to make orders and regulations to meet any emergency for the purpose of suppressing nuisances dangerous to public health and communicable, contagious, and infectious diseases and other dangers to public life and health. • Authorizes the Commissioner to act with full authority of the Board of Health when it is not in session.
Disease Control Measures §32.1-42; §32.1-43; §32.1-48	• Authorizes the Commissioner to require quarantine, vaccination, or treatment of any individual when he determines it necessary to control the spread of any disease of public health importance. • Permits the Commissioner to require immediate vaccination of all persons in the event of an epidemic.
Isolation of Certain Persons with Communicable Diseases § 32.1-48.02 through §32.1-48.04	• Authorizes the Commissioner to order individuals with airborne communicable diseases be taken into custody. • Authorizes the Commissioner to petition for a hearing on temporary detention of individuals infected with a communicable disease. • Provides guidelines for isolation hearings.

VI. Morbidity and Mortality Projections

The CDC has developed a model for predicting estimates of the impact of deaths, hospitalizations, and outpatient visits due to pandemic influenza.[3] The model was used to develop Virginia specific estimates of morbidity and mortality from pandemic influenza. Calculations were based on Virginia population estimates from 1999 U.S. Census Bureau data (population total: 7,139,140). Twelve weeks of pandemic influenza activity were assumed, with attack rates of 15%, 25% and 35%. While attack rates of a pandemic cannot be predicted with certainty, the range used in the calculations includes the range of attack rates from past pandemics. Gross attack rates reflect the percentages of the population with a case of influenza causing some measurable impact (e.g. work time was lost, patient visited the doctor).

Projected outpatient visits are shown in Table 3 for age group categories across attack rates. The chart shows, for example, that with a 15% attack rate, individuals in the 0-18 year age group would require a total of 173,729 outpatient visits for influenza. The largest number of outpatient visits, 791,229, would occur in the 19-64 year age group, under a 35% attack rate. Outpatient visits were calculated by applying national outpatient visit rates, modeled from past epidemics, to Virginia population data. Outpatient visit rates used in the projections can be found in Appendix F.

The capacity of outpatient services in Virginia to respond to pandemic influenza was calculated under the following assumptions: 1. In addition to a physician's normal patient load, he could treat five additional pandemic influenza patients per day; and 2. Only primary care physicians, internists, and pediatricians (N=2,630) in Virginia would treat influenza cases on an outpatient basis. We were unable to determine estimates of physician assistants, nurse practitioners, and nurses to include in the model; these clinicians will greatly support the medical infrastructure during a pandemic. Under the stated assumptions with a 15% attack rate, outpatient services would be at 61% capacity. Assuming attack rates of 25% and 35%, outpatient services would be at 101% and 141% capacity, respectively. The number of outpatient visits and outpatient visit capacity during a pandemic could differ significantly from our projections.

Table 3. Outpatient Visits by Attack Rate

	Number of Outpatient Visits		
Age Groups (years)	15% Attack Rate	25% Attack Rate	35% Attack Rate
0 –18	173,729	289,548	405,367
19 – 64	339,098	565,163	791,229
65+	61,018	101,696	142,375
Total	**573,845**	**956,407**	**1,338,971**

Projected hospitalizations were calculated using national estimates of predicted hospitalizations during a pandemic, applied to Virginia population data. Groups at high-risk for complications of influenza infection were considered as a factor in the projections.[4 5] Table 4 outlines the number of projected hospitalizations by age group and attack rate. Hospitalization rates assumed for each of the age groups and the percentages of the Virginia population assumed to be at high-risk for influenza complications can be found in Appendix F. It is important to note that during an actual pandemic, both hospitalization rates and the percentage of the population at high-risk for influenza complications could vary significantly from the rates and percentages used to develop these projections.

Table 4. Projected Hospitalizations by Attack Rate

	Number of Hospitalizations		
Age Groups (years)	15% Attack Rate	25% Attack Rate	35% Attack Rate
0 –18	549	914	1,280
19 – 64	8,123	13,539	18,954
65+	3,436	5,727	8,018
Total	**12,108**	**20,180**	**28,252**

Death projections, shown in Table 5, were calculated using national estimates of influenza mortality from past epidemics, applied to Virginia population data.[4 5] As shown in Table 5, under a 35% attack rate, up to 6,287 Virginians could lose their lives from pandemic influenza. Death rates assumed for each of the age groups can be found in Appendix F. The number of high-risk individuals in Virginia, based on the current ACIP definition of groups at high-risk for complications of influenza infection, was included as a factor in the projections.

During an actual pandemic, both influenza death rates and the high-risk populations could vary significantly from the rates and percentages assumed in the projections.

Table 5. Projected Deaths by Attack Rate

Age Groups (years)	Number of Deaths		
	15% Attack Rate	25% Attack Rate	35% Attack Rate
0 –18	31	51	72
19 – 64	1,375	2,292	3,208
65+	1,289	2,148	3,007
Total	**2,695**	**4,491**	**6,287**

During a pandemic, public health will play an important role in the administration of influenza vaccine. Public health administers approximately 20% of the total vaccine for the Virginia population during a normal influenza season.[6] During a pandemic, public health could administer a similar percentage of the vaccine, or it could be responsible for administering *all* vaccine doses in the state. Projections of public health provider time needed are shown in Table 6 for both scenarios. For example, if public health administered 100% of doses to all high-risk individuals in the state, then 178,767 hours of provider time would be needed. If public health administered 20% of doses to all high-risk individuals in the state, then 35,753 hours of provider time would be needed. Projections were made based on the assumption that ten minutes of public health provider time, including time for paperwork, would be needed to administer one dose of influenza vaccine. Provider time needed to administer vaccine during a pandemic could differ significantly, especially if the vaccine is administered under an IND protocol.

Total doses required for different vaccination scenarios, assuming that a single dose is needed for each patient, are also shown in Table 6. For example, if all high-risk individuals in the state received a single vaccine dose, 1,072,604 doses would be needed. In a pandemic, two doses may be required for immunity, doubling all estimates shown in the table.

Table 6. Vaccine Doses Needed and Demand on Public Health

Group Receiving Vaccine	Total Vaccine Doses	Public Health Provider Time Needed (hours)	
		20% of doses provided	100% of doses provided
High-risk individuals	1,072,604	35,753	178,767
Age group 20-40 years	2,332,421	77,747	388,737
Emergency/health care personnel and usual high-risk individuals	1,159,129	36,638	193,188
40% of population	2,855,656	95,189	475,943
60% of population	4,283,484	142,783	856,697

Note: The total Virginia population assumed in these calculations was 7,139,140 persons, taken from 1999 U.S. Census Bureau estimates.

VII. Surveillance

Virginia's influenza surveillance system is designed to quickly detect outbreaks of disease and identify the organisms involved in order to facilitate early public health intervention. The system has three main components: passive surveillance, active sentinel physician surveillance, and laboratory surveillance. Data on mortality from influenza and pneumonia are also available on a weekly basis through the federal 122 Cities Mortality Reporting System; in Virginia, the cities of Richmond and Norfolk participate in the reporting system.

In the event of an influenza pandemic, additional surveillance activities will be implemented, including: daily monitoring of hospitals for influenza activity, analysis of syndromic surveillance data from participating health systems, review of non-hospital influenza related deaths, collection and analysis of vaccine and antiviral adverse events data, and increased coordination of surveillance activities with neighboring jurisdictions.

Pre-pandemic Influenza Surveillance Activities

Passive Surveillance

The first component of the existing influenza surveillance system, passive surveillance, utilizes influenza information received from physicians, persons in charge of medical care facilities, and directors of laboratories who are required by the *Regulations for Disease Reporting and Control* to report influenza cases in Virginia residents to the health department. Information is reported throughout the year to local health departments and then relayed to the state health department, where it is tabulated weekly and forwarded to the CDC.

Beginning with the 2003-04 influenza season, VDH started conducting enhanced passive surveillance for influenza-associated deaths in persons less than 18 years of age. The goals of this enhanced surveillance are to: monitor and describe the incidence, distribution and basic epidemiologic characteristics of deaths among children related to influenza virus infection; provide data to guide future influenza immunization policy; and to rapidly recognize influenza seasons in which the impact of influenza appears to be unusually severe among children. Two influenza-associated pediatric deaths were reported during the 2003-04 season, and two were reported during the 2004-05 season.

Active Sentinel Physician Surveillance

The second component of the influenza surveillance system is sentinel physician surveillance. Sentinel physicians voluntarily participate in the surveillance system, which is active from October through May of every year. Physicians monitor the number of patients presenting to their offices with influenza-like illness and report the number to the local health department, which relays the information to DSI at the state health department. DSI tabulates data from across the state in order to assess and classify the level of influenza activity (See *Influenza Activity Levels*). Sentinel physicians are distributed geographically among the state's five health-planning regions, assuring that the population under surveillance is spread throughout the state. Baseline incidence levels of disease are established from data collected from the first week in October through the second week in November. Ongoing data collection continues through May of the following year.

During the 2004-2005 influenza season, a total of sixty-six physicians participated in the Sentinel Physician Surveillance Program, giving Virginia a sentinel physician to population ratio of 1:110,508, exceeding the CDC recommendation for a sentinel physician to population ratio of at least 1:250,000.

VDH also participates in the CDC Sentinel Physician Program, where enrolled providers report the number of patients presenting to their offices with influenza-like illness by age group; providers also report the total number of patients seen at the facility. Data are entered weekly into a secure website maintained by the CDC. Twelve providers participated during the 2004-2005 influenza season.

Laboratory Surveillance

A third component of the system is laboratory surveillance. The state laboratory identifies strains of influenza virus present in Virginia so that a comparison between the strains present and the vaccine may be made. Information on influenza strains present in the state can also be used to formulate recommendations for antiviral therapy. The laboratory accepts specimens throughout the year, but sentinel physicians are particularly encouraged to send nasopharyngeal and serum specimens for examination, especially in the early and late stages of each influenza season.

Outbreaks

All outbreaks influenza are required to be reported to local health departments within 24 hours. For the 2004-05 influenza season, twenty-five confirmed outbreaks of influenza were reported, most of which occurred at facilities such as nursing homes or assisted living centers. When outbreaks are reported, health departments work with facilities to implement disease control interventions such as: vaccination of unvaccinated individuals; administration of antiviral medications; implementation of infection control precautions; and other interventions as appropriate (e.g., halting facility admissions, cohorting residents/staff, etc.).

122 Cities Mortality Reporting System

Each week, the vital statistics offices of 122 cities across the nation report to CDC the total number of death certificates filed and the number of those for which pneumonia or influenza was listed as the underlying or contributing cause of death. In Virginia, the cities of Richmond and Norfolk participate in the reporting system. CDC publishes the data in its Morbidity and Mortality Weekly Report.

Influenza Activity Levels

The influenza season in Virginia typically runs from the October of one year through March or April of the following year. Data collected through the Sentinel Physician Surveillance System and data from the passive reporting system are tabulated weekly. This information, along with laboratory identification of viral agents, is used to monitor and define influenza activity during the flu season. The numbers do not represent all cases of influenza-like illness seen in Virginia; rather, they allow the health department to monitor the relative levels of activity and to provide the CDC with weekly reports on the status of influenza activity in Virginia. Activity is characterized as no activity, sporadic, local, regional or widespread according to the definitions outlined in Table 7.

Table 7. Influenza Activity Levels

Activity Level	Influenza Like Illness (ILI) Activity/ Outbreaks		Laboratory data
No activity	Low	**And**	No lab confirmed cases
Sporadic	Not increased*	**And**	Isolated lab-confirmed cases
	OR		
	Not increased	**And**	Lab confirmed outbreak in one institution**
Local	Increased ILI in 1 region; ILI activity in other regions is not increased	**And**	Recent (within the past 3 weeks) lab evidence of influenza in region with increased ILI
	OR		
	2 or more institutional outbreaks (ILI or lab confirmed) in 1 region; ILI activity in other regions is not increased	**And**	Recent (within the past 3 weeks) lab evidence of influenza in region with the outbreaks; virus activity is no greater than sporadic in other regions
Regional	Increased ILI in 2 regions	**And**	Recent (within the past 3 weeks) lab confirmed influenza in the affected regions
	OR		
	Institutional outbreaks (ILI or lab confirmed) in ≥2 and less than half of the regions	**And**	Recent (within the past 3 weeks) lab confirmed influenza in the affected regions
Widespread	Increased ILI and/or institutional outbreaks (ILI or lab confirmed) in three or more regions	**And**	Recent (within the past 3 weeks) lab confirmed influenza in the state.

* Activity is increased when the number of cases reported for an area is three times the activity level during baseline data collection (October through the second week in November).
** Institution includes nursing home, hospital, prison, school, etc.

Animal Surveillance

The Virginia Department of Agriculture and Consumer Services (VDACS) maintains surveillance on animal populations in Virginia, including surveillance for avian influenza in poultry. The Division of Zoonotic and Environmental Epidemiology (DZEE) within the VDH Office of Epidemiology maintains ongoing communication with VDACS regarding disease in animal populations that may affect humans and is notified of epizootic and zoonotic disease events.

Pandemic Influenza Surveillance Activities

During a pandemic, in additional to routine surveillance, other activities will be undertaken in order to assess and control the scope of the disease across the state. Checklists of activities for all phases of pandemic influenza have been included in the appendices. Activities that will be the responsibility of the state office are in Appendix F, and recommended activities of the local health districts are in Appendix G. Key surveillance activities, which will likely

begin during the Pandemic Alert phase and continue through the end of the pandemic will include:

1. *Monitoring of sentinel hospitals for influenza activity.* On a daily basis, if determined to be feasible, district staff will be in contact with emergency room staff and infection control practitioners within their jurisdictions to monitor influenza activity levels at hospitals. The number of emergency department visits, hospital admissions, and hospital deaths will be reviewed daily. DSI will be responsible for statewide planning and coordination of hospital surveillance data.

2. *Analysis of daily syndromic surveillance data for flu-like illness reported from participating health systems across the state.* DSI and district staff will review syndromic surveillance data daily and monitor trends of illness and investigate increases in reports of influenza-like illness as appropriate.

3. *Daily review of influenza, pneumonia, or other respiratory infection causes of death from the Office of the Chief Medical Examiner (OCME).* OCME surveillance staff will review influenza related deaths that occur outside of hospitals and report them to DSI.

4. *Collection and analysis of vaccine adverse events data.* The Division of Immunization will continue to partner with CDC to collect information on adverse events through the Vaccine Adverse Events Reporting System (VAERS).

5. *Collection and analysis of antiviral adverse events data.* DSI and the Division of Immunization will work with communications staff to establish a reporting system for adverse events resulting from use of antiviral medications. Data will be collected, analyzed, and reported to the CDC. Recommendations for use of antiviral medications may be adjusted based on information learned from adverse event data analysis.

6. *Coordination with the VDACS to monitor populations affected by outbreaks of influenza in animals.* If an outbreak of avian influenza is identified in Virginia, DZEE and DSI will work with VDACS to monitor human populations who are at risk of becoming infected. DZEE and DSI will work with VDACS to make recommendations for individuals who may be involved in culling operations, including recommendations for appropriate personal protective equipment, disinfection, and surveillance for human illness. DZEE and DSI will coordinate with VDACS to conduct studies as needed.

7. *Coordination with neighboring jurisdictions.* DSI will work with neighboring states, the District of Columbia and CDC to monitor influenza activity levels in the region. Special studies may be conducted as needed.

Enhanced surveillance measures, as outlined above, will be used to detect pandemic influenza activity levels across the state and to facilitate public health investigation and control interventions. When necessary, DSI may implement additional surveillance measures in order to identify and control the spread of influenza.

VIII. Communications

The primary communications goal of VDH during a pandemic will be to ensure the timely, accurate, and consistent flow of information. Information will primarily be provided to local health districts, which will then relay the information to health professionals and the general public within their jurisdiction. However, central office staff will be available as needed to provide information and technical assistance directly to health professionals on: vaccine management, antiviral use for treatment and chemoprophylaxis, influenza surveillance, infection control, and treatment and care of patients.

Key communication activities of DSI will include:

- Monitoring bulletins from the CDC and WHO regarding virologic, epidemiologic, and clinical findings associated with new variants isolated within or outside of the country.
- Distribution of timely and appropriate influenza bulletins and alerts through the Health Alert Network.
- Provision of live, interactive videoconferencing on influenza, which can be initiated among VDH health districts and central office personnel.
- Provision of guidance and recommendations to local health departments, healthcare providers, and/or the general public about pandemic influenza.
- Provision of information about the status of the epidemic in Virginia and recommendations about ways to minimize risk of disease.
- Provision of technical information on influenza that may be used for media messages.
- Weekly reporting on influenza activity levels across the state, including posting of data to the VDH Office of Epidemiology website.

Key communication activities of the Division of Immunization will include:

- Training of IND protocol for health districts and other relevant partners.
- Dissemination of information on VAERS through the Health Alert Network.
- Dissemination of information about vaccine availability and distribution plans to district health departments.
- Dissemination of the influenza vaccine information sheet to district health departments.
- Communication of information about groups at high-risk for complications from influenza to district health departments.

Key communication activities of District Health Departments will include:

- Identification of two spokespersons for each health district who will be responsible for addressing pandemic influenza related media concerns.
- Distribution of timely and appropriate influenza bulletins to health care providers and community partners.
- Dissemination of information about vaccine availability and distribution plans to community partners.
- Dissemination of the influenza vaccine information sheet to clinic patients and area health care providers.
- Communication of information about groups at high-risk for complications from influenza to health care providers and community partners.

The agency Public Relations Manager will coordinate translation of major public information documents for non-English speaking persons and will also coordinate and arrange for news conferences, as they are needed. Throughout the pre-pandemic period, communications staff will develop risk communications messages for different vaccination scenarios. A draft of potential risk communication messages is located in Appendix I.

VDH will also partner with the Department of Mental Health, Mental Retardation and Substance Abuse Services (DMHMRSAS) to develop and distribute press releases that address fear and other psychological reactions to an influenza pandemic.

IX. Role of the Public Health Laboratory

VDH state and district offices will work with the Division of Consolidated Laboratory Services (DCLS) to ensure the proper collection, transport, and testing of influenza specimens throughout all stages of an influenza pandemic. Nasopharyngeal specimens (swab or wash) are collected for laboratory testing to detect and characterize influenza virus. Acute and convalescent serology specimens should also be collected when indicated. Consult with DCLS about laboratory testing and interpretation of results. Influenza specimen collection guidelines can be found in Appendix H.

Virus culture collection kits for nasopharyngeal specimens are provided by DCLS for state and federal surveillance and for outbreak investigations. Specimens for influenza virus culture should be obtained within the first 48 hours of illness. Refrigerate specimens after collection and during shipment. The DCLS courier provides transport to and from each of the thirty-five Virginia health districts and DCLS, including transport of influenza specimens. The courier service is routinely available Monday through Friday. Specific information about pickup and delivery times and locations may be obtained from health district offices.

The best specimen for detection of influenza virus is a nasopharyngeal swab or wash. DCLS currently performs three tests to detect influenza virus in nasopharyngeal specimens:

1. Antigen Detection by Direct Fluorescent Antibody (DFA)
   DFA testing can be performed rapidly on the original patient specimen. Results are generally available on the same day the specimen is received in the laboratory. Positive results identify the virus as Influenza A or Influenza B. Negative results do not rule out influenza because antigen detection is less sensitive than culture or RT-PCR.

2. RNA Detection by Real Time Reverse-Transcriptase Polymerase Chain Reaction (RT-PCR)
   Real time RT-PCR can be performed rapidly on the original patient specimen, with results generally available on the same day the specimen is received in the laboratory. Positive results identify the virus as Influenza A or Influenza B, and also subtype Influenza A viruses as either H1 or H3, the currently circulating subtypes. If RT-PCR results were to detect an Influenza A virus which did not subtype as either H1 or H3, an immediate investigation would assess the possibility of infection by a new subtype of Influenza A.

3. Virus culture
   The patient specimen is placed into cell culture for isolation of common respiratory viruses, including influenza virus. Positive results may be available within a few days, but cultures are held for 14 days before being reported as negative. When a virus culture is positive for influenza, the virus is identified as either Influenza A or as Influenza B. Influenza A viruses are routinely subtyped as H1 or H3 by monoclonal antibody.

Further subtyping of influenza virus is done at DCLS and at CDC. Selected Influenza A and Influenza B isolates are subtyped at DCLS by hemagglutination inhibition to test whether the isolate is closely related to the influenza virus strains included in the current season's influenza vaccine. A few selected isolates are sent to CDC for complete subtype characterization as part of the WHO surveillance to determine which strains of influenza virus should be included in the next season's vaccine. If at any stage of subtyping, laboratory tests were to indicate that an influenza virus isolate may be a strain of influenza different from those currently circulating, immediate investigation would occur, including notification of VDH DSI and CDC.

During the Pandemic Alert stage, DSI will work with DCLS to establish a sampling protocol for influenza laboratory testing across the five VDH health regions, based on the projected burden of the pandemic and the resources available for laboratory testing. Once pandemic influenza has been established in a health region, laboratory testing for that region may be scaled down, depending on the public health need for additional testing. Sampling protocols may be changed once progression to the next pandemic influenza phase has been declared.

Areas which remain to be addressed to enhance laboratory readiness for pandemic influenza include the following:

- Implementation of a rapid non-culture method (e.g. RT-PCR) to identify an influenza virus as H5N1 or other subtype uncommon in humans is hindered by lack of positive controls or positive specimens to verify test performance at state public health laboratories, including DCLS.
- A rapid culture method (shell vial centrifugation culture) for respiratory viruses including influenza is not available at DCLS but is under development.
- Although DCLS has high containment virus culture facilities (BSL-3), it currently does not have the higher level of biocontainment (BSL-3+ or BSL-4) needed for safely growing highly pathogenic strains of avian influenza.

X. Vaccine Management

Storage Options

The Virginia Department of Health, Division of Immunization, has six storage options in the event pandemic influenza necessitates mass vaccination:

1. General Injectables and Vaccines (GIV), VDH's private vaccine distribution contractor located in Bastian, Virginia, will handle primary distribution and storage of vaccine. The facility can be contacted at (800) 475-6475. The Division currently contracts with GIV for Vaccines For Children (VFC) vaccine distribution. An amendment to the current contract has been completed. The amendment outlines storage and shipping guidelines in the event of a pandemic. GIV will maintain minimum reserve capacity to store and ship

up to 2 million doses. They have the ability to ship the vaccine to private providers, public providers, local health departments, and community health centers.

2. The Virginia Department of General Services (DGS) operates a warehouse/distribution center in Eastern Henrico County. This facility will serve as the secondary location for influenza vaccine storage and distribution. The DGS facility consists of approximately 128,000 square feet of combined office and warehouse space. The warehouse has 28 bays with loading docks and a secure access refrigerated storage area. About 25,000 square feet of open space is available for unloading and repackaging. Multiple security features are in place and patch panels for telephone and fiber optic hubs are available. Division of Immunization staff trained in vaccine storage and handling, would be primarily responsible for the break down and repackaging of vaccine. Vaccine will be shipped by a contracted vendor and can be sent via overnight delivery if necessary. For more information concerning this facility, please refer to the VDH Central Region Strategic National Stockpile Plan.

3. The State Pharmacy, within the Division of HIV, STD and Pharmacy Services, provides biologics and vaccines to all local health departments. The contact, the Pharmacy Director, can be reached at (804) 786-4326. The facility has limited storage capabilities (approximately 300,000 doses of influenza vaccine) but does have staff with expertise and ability to handle vaccine distribution to the local health departments.

4. Tractor-trailers capable of refrigerated storage can be rented from Virginia Trailer, Inc. in Chester, Virginia. Tractor-trailers are dropped off at designated locations with a full tank of diesel gasoline. The truck runs continuously to maintain the appropriate storage temperature. Depending on the weather and the desired storage temperatures, the truck can use up to ½ gallon of fuel per hour. The trucks hold 35-100 gallons of fuel, so in the worst-case scenario, for a truck with a small tank, refueling would be necessary every 3 days. The health department would be responsible for any refueling that may be necessary. Rental fees are as follows: $85/day, $325/week, and $950/month. An extra fee of $75 for delivery and $75 for pick up is charged for sites in the Richmond area. Delivery fees are higher for locations further away. Trailer sizes range from 45-48 feet long, and are 8 feet high and 8 feet wide. Trailers are usually available with minimum notice (often same day notice), but that is not guaranteed. The telephone number is (804) 768-1000 and the contact is Frankie Davies. Virginia Trailer, Inc. is located at: 11601 Old Stage Road, Chester, VA 23836.

5. Refrigerated warehouse space can be rented from Richmond Cold Storage Company, Inc. Storage is rented by palate size; a palate measures 40 by 48 inches and can be stacked up to five feet high with vaccine. The cost for palate storage is $50 to $60 dollars per month. If the storage area needs to be accessed on a frequent basis (rather than just drop off and pick up), the cost may be slightly more. Many clients share the warehouse space, so the vaccine would not have its own separate "room" and may be placed next to a palate of food. Separate rooms are available, but four to five tractor-trailer loads full of merchandise would have to be filled for it to be designated as health department space only. Minimum advanced notice is required; 24 hours should be sufficient. The corporate office for Richmond Cold Storage Company, Inc. is located at 420 North 18th Street, Richmond, Virginia. The telephone number is (804) 644-2671, and the contact is

Scott Chapman. The refrigerated warehouses are located at 5501 Corrugated Road in Henrico County and 2900 Cofer Road in Richmond City.

6. Drop shipments from the vaccine manufacturer to the local health departments, if available, will serve as a final choice for vaccine storage/distribution. The storage capability of each health department varies; however, each department has some storage available now.

Guidelines for Storage and Shipment

To ensure vaccine viability, influenza vaccine should be shipped and stored according to the following guidelines:

- *Shipping Requirements:* Influenza vaccine should be delivered in the shortest possible time. It should not be exposed to excessive temperatures. Vaccine is generally shipped in insulated containers with coolant packs.
- *Condition on Arrival:* Vaccine should not have been frozen. Refrigerate immediately upon arrival.
- *Storage Requirements:* Influenza vaccine should be refrigerated at 2° to 8°C (35° to 46°F). **Do not freeze.**
- *Shelf Life:* Vaccine is formulated for use within the current influenza season.
- *Instructions for Reconstitution or Use:* Shake vial vigorously before withdrawing each dose.
- *Shelf Life after Opening:* Vaccine is viable until outdated if not contaminated.
- *Special Instructions:* Rotate stock so that the shortest dated vaccine is used first. Influenza vaccine must not be frozen.

Primary Vaccine Distribution Plan

Assuming that 60% of the population of Virginia needs to be vaccinated with one dose of vaccine, 4,283,484 doses of influenza vaccine will be needed to protect the Commonwealth (See Table 6). If the state receives all of the vaccine for the Virginia population, GIV will serve as the primary shipper, sending 75% of the vaccine, or 3,212,613 doses to health districts or other partners across the state. GIV has reserve capacity for 2 million doses, and could ship that amount within two weeks. It will take them three weeks to ship the entire amount of vaccine at a cost of $0.14 per dose.

The Division of Immunization will be responsible for 25% of the shipment or 1,070,871 doses. The DGS warehouse and distribution center would be able to store this amount at one time. According to GIV, one person can pick 125 doses of vaccine per minute and pack 100 doses per minute. For our purposes, we will assume that novice vaccine shippers will require three minutes to pick and pack 100 doses of vaccine, requiring a total of 535 hours to ship the vaccine. Assuming a 40-hour workweek, thirteen people would be needed to ship the vaccine in one week.

Secondary Vaccine Distribution Plan

In the event that the primary distribution plan cannot be activated, Virginia Trailer Rental Inc. could be used to ship vaccine to pick-up locations across the state. Frankie Davies is the

contact person (804) 768-1000 (ph). During pre-pandemic planning, the Division of Immunization will work with the company to establish pick-up locations. The local Immunization Action Program Coordinators will be responsible for arranging pick-up of vaccine for their district.

XI. Influenza Antivirals

In the United States, four antiviral agents are approved for preventing or treating influenza: amantadine, rimantadine, zanamivir, and oseltamivir. Amantadine and rimantadine are effective against type A influenza only, and are approved by the Food and Drug Administration for influenza A prophylaxis in persons 1 year of age and older. Amantadine is approved for treatment of persons 1 year of age and older; however, rimantadine is approved for treatment of adults only. When administered prophylactically before and throughout an epidemic, both drugs are approximately 70%-90% effective in preventing illness from influenza A infection. When used as prophylaxis, amantadine and rimantadine can prevent illness while permitting sub-clinical infection and the development of protective antibodies against circulating influenza viruses. Therefore, some individuals who take these drugs will develop a protective immune response to circulating influenza viruses.

When used as a treatment, amantadine and rimantadine can reduce the duration of uncomplicated influenza A illness by approximately 1 day, if administered within 2 days of illness onset. To reduce the emergence of antiviral drug-resistant viruses, amantadine or rimantadine therapy should be discontinued as soon as clinically warranted, typically after 3-5 days of treatment or within 24-48 hours after the disappearance of signs and symptoms. Side effects of both medications can include: nervousness, anxiety, difficulty concentrating, lightheadedness, and insomnia. Central nervous system side effects occur more frequently among persons taking amantadine than among those taking rimantadine.

Zanamivir and oseltamivir are members of a class of drugs called neuraminidase inhibitors, and are active against both influenza type A and type B. Although not FDA approved for prophylaxis, zanamivir is similarly effective as oseltamivir in preventing influenza illness, according to the ACIP. Zanamivir is FDA approved for treatment of uncomplicated acute influenza A or B in persons 7 years of age and older who have been symptomatic for no more than 2 days. Side effects of zanamivir include decreased respiratory function and bronchospasms. It is not recommended for use in individuals with underlying airway disease. Oseltamivir is approved for prophylaxis of influenza infection among persons ≥13 years. It is approved for the treatment of uncomplicated influenza A or B in persons 1 year of age and older who have been symptomatic for no more than 2 days. Side effects reported most often in individuals taking oseltamivir include nausea and vomiting. Zanamivir and oseltamivir have been shown to reduce the duration of uncomplicated influenza A and B illness by approximately 1 day. The recommended duration of treatment with either zanamivir or oseltamivir is 5 days.[7]

It is important to note that antiviral agents are an adjunct and not a substitute for vaccine. Vaccination remains the principal means for preventing influenza-related morbidity and mortality.

The CDC and VDH will make recommendations for use of antiviral agents based on availability during an actual pandemic. VDH will consider input about prioritization of antiviral agents from the Pandemic Influenza Advisory Committee. General guidelines for antiviral use

can be found in Appendix E. Table 8 addresses the antiviral agents currently available and their current approved use for prophylaxis and/or treatment.

Table 8. Antiviral Agents for Prophylaxis and Treatment of Influenza

Antiviral Agent	Trade Name	Flu Type	Use	Age Restrictions
Amantadine	Symmetrel®	A	Prophylaxis/Treatment	≥ 1 year
Rimantadine	Flumadine®	A	Prophylaxis/Treatment	Adults only for treatment ≥ 1 year for prophylaxis
Zanamivir	Relenza®	A and B	Treatment only	≥ 7 years
Oseltamivir	Tamiflu®	A and B	Prophylaxis/Treatment	≥ 1 year for treatment ≥ 13 years for prophylaxis

XII. Mass care

Mass patient care will be implemented through procedures outlined in the VDH Emergency Operations Plan. Additionally, it is recommended that local health districts contact hospitals within their jurisdictions to collaborate with them in ensuring provisions for mass care of community members. In partnership with hospitals, health departments should determine and outline their roles in a mass care event. Offsite triage, care, transportation of patients, and housing of patients should be addressed.

XIII. Mass Vaccination and Treatment

All local health departments have mass vaccination and treatment plans in place. Elements of plans include: staffing and training, clinic layout and flow, documentation and paperwork, security, clinic supplies and equipment, transportation, vaccine storage and handling, vaccine security and tracking, disposal of needles and medical supplies, communications systems, and post clinic activities. Additional guidance can be found under *Vaccine Clinic Guidelines* in the Smallpox section of the VDH Emergency Operations Plan

Some areas that need special planning for pandemic influenza include:

- Defining procedures to assure the biological safety and physical security of the vaccine within the health department.
- Identifying community partners who will work with the health department to administer vaccine to targeted populations. During the pre-pandemic stage, when possible, establish written agreements with partners or contractors regarding administration of vaccine during a pandemic.
- Identifying backup locations/capacity for immunization clinics (e.g. schools, community centers, churches, county/state buildings). During the pre-pandemic stage, when possible, establish written agreements with backup locations for use of the facilities.
- Identifying contract staff (including nurses, administrative staff, etc) available for immunization clinics.
- Identifying extra refrigerated storage space available for influenza vaccine.

Technical support and consultation on mass vaccination and treatment are available from the state office.

Appendix A. Pandemic Influenza Issues

The draft Pandemic Influenza Preparedness and Response Plan, released by the Department of Health and Human Services in August 2004, outlines several features that set pandemic influenza apart from other emergencies or community disasters:

- Outbreaks can be expected to occur simultaneously throughout much of the U.S., preventing shifts in human and material resources that usually occur in response to other disasters;
- Effects on individual communities will be relatively prolonged (weeks to months) in comparison to other disasters;
- Healthcare workers and other first responders may be at higher risk of exposure and illness than the general population, further straining the healthcare system;
- Preventive and therapeutic medicines (e.g., vaccine and antiviral agents) will be delayed and in short supply; and
- Widespread illness in the community could increase the likelihood of sudden and potentially significant shortages of personnel in other sectors who provide critical public safety services.

Additional planning is needed on the local, state and national levels to address some of the unique issues surrounding pandemic influenza. Examples of issues that require further discussion and planning include:

- **Vaccine Delivery**
  Because a shortage of vaccine is anticipated early in the pandemic, prioritization of persons receiving the initial doses of vaccine will be necessary. Issues will arise, such as: What populations should receive the vaccine in the event of a shortage? How will decisions be made about sub-groups in each of the priority populations (e.g., how to define a 'healthcare worker')? How will vaccine be distributed to priority groups? How will vaccination of priority groups be enforced and will people have to 'prove' that they fit into a priority group (for example, by providing documentation of their diabetes)? How will security of the vaccine be maintained?

- **Antiviral Medications**
  Because vaccine will likely not be available when the virus first affects communities, antiviral medications may play an important role for the prevention and control of influenza, especially during the period before vaccine is available. Some issues that will arise include: What populations should receive antivirals in the event of a shortage? Should antiviral use be recommended for either prophylaxis or treatment or both? Should antiviral medication required by persons with certain diseases (e.g., Parkinson's disease) be reserved for this indication?

- **Healthcare Facilities**
  Healthcare facilities will encounter many issues regarding both the treatment of patients and the protection of their workers. Some issues that may arise include: Will public health provide any guidance to healthcare facilities regarding patient prioritization or triage of patients (e.g., cancellation of elective admissions and surgeries)? How will facilities make decisions about prioritization of scarce resources (e.g., ventilators)? What steps will be taken to address staffing shortages at hospitals? What steps will be recommended to protect healthcare workers when personal protective equipment is in short supply?

- **Community Transmission**
  Widespread occurrence of influenza in the community will create many concerns, including: What are the essential services that cannot be stopped in any event (e.g., water, electricity, nuclear power plants)? What steps will be taken to ensure that essential service workers are prioritized to receive vaccine and/or antiviral medications? At what stages in the pandemic will recommendations to minimize community transmission be made (e.g., through cancellation of sports events, school closures)? Will the recommendations be enforced? At what stages in the pandemic will isolation and quarantine be used as tools to reduce transmission?

Appendix B. Organizations Represented on the VDH Pandemic Influenza Advisory Committee

Alexandria Health Department
Bon Secours Health System
Division of Consolidated Laboratory Services
Emergency Preparedness and Response, VDH
Inova Fairfax Hospital
Lord Fairfax Health Department
Office of the Attorney General
Office of the Chief Medical Examiner, VDH
Office of Emergency Medical Services, VDH
Office of Epidemiology, VDH
Office of the Governor
Richmond City Health Department
St. Mary's Hospital
Troutman Sanders LLP
University of Virginia Institute for Practical Ethics
Virginia Department of Agriculture and Consumer Services
Virginia Department of Education
Virginia Department of Emergency Management
Virginia Department of Mental Health, Mental Retardation and Substance Abuse Services
Virginia Health Quality Center
Virginia Health Care Association
Virginia Hospital and Healthcare Association
Virginia House of Delegates
Virginia Medical Society
Virginia Pharmacy Association
Virginia Primary Care Association
Virginia State Police

Appendix C. Influenza: Overview for Healthcare Providers

Based on Recommendations of Advisory Committee for Immunization Practices (ACIP)

Organism	• Influenza virus – types A; (A is further categorized into subtypes); B; type C - rare cause of disease • Frequent mutations of surface glycoprotein genes result in new influenza virus variants o Antigenic shift → emergence of completely new subtypes (type A only; leads to pandemics) o Antigenic drift → minor changes (all types; leads to frequent outbreaks & epidemics)
Reservoir	Type A – humans; swine; birds; types B & C – humans
Communicability	• Person-to-person, primarily through coughing and sneezing of infected persons • Communicable 1 day before onset of symptoms until approximately 5 days thereafter • Disease usually peaks in U.S. from December to March. • In pandemics, entire population susceptible; attack rates high among all ages
Mortality Rates	Deaths result from pneumonia and exacerbations of cardiopulmonary and other chronic conditions. • **Interpandemic years**: 1972 through 1992 - 9.1 deaths per 100,000 Americans per season • **Pandemics**: 1918 Spanish flu – 218.4 deaths per 100,000 Americans; 1957 Asian flu – 22 deaths per 100,000; 1968 Hong Kong flu – 13.9 deaths per 100,000
Incubation period	1-3 days
Symptoms	• Influenza A – Abrupt onset of fever, myalgia, headache, severe malaise, sore throat, rhinitis, nonproductive cough (symptoms last limited number of days; cough can persist for 2 weeks) • Influenza B – Similar but milder symptoms than type A; occurs primarily in children
Complications	High risk: Age 6-23 months, ≥65 yrs.; nursing home residents; persons w/ chronic cardiac, pulmonary, metabolic & renal conditions & hemoglobinopathies; immunocompromised; >12 wks of pregnancy • Pneumonia - secondary bacterial (most frequent) and primary influenza viral • Worsening of underlying medical conditions • Rarely associated with Reye syndrome (occurs primarily in children with Influenza B taking aspirin); myocarditis; encephalopathy; transverse myelitis; myositis; pericarditis
Laboratory tests	Rapid antigen tests; viral culture; RT-PCR; serology
Infection control	Standard precautions, strict hand washing. For hospitalized cases: isolation; droplet precautions Airborne precautions may be advised during special circumstances such as a novel virus alert.
Prevention	**Primary strategy**: Vaccination annually before influenza season • Antigenic drift necessitates annual reformulation of flu vaccine to incorporate ≥1 new strains • Contraindications – allergy to egg or vaccine; avoid in persons with previous severe reaction • Delay vaccination of persons with acute febrile illness but not minor illness, with or without fever • Inactivated (i.e., killed) trivalent vaccine; approved for ages ≥6 months old: provides 70-90% protection in healthy adults; reduces complications by 50-60% and death by 80% among elderly in nursing homes • Live attenuated influenza vaccine; approved only for healthy individuals ages 5-49 and **not** for persons with underlying medical conditions, immunocompromised persons, persons with asthma, reactive airway disease or other cardiac/pulmonary disorders, pregnant women, or children receiving aspirin therapy or other salicylates. Such individuals should receive the inactivated vaccine. **Adjunct strategy**: Chemoprophylaxis with antivirals for unvaccinated high risk & advanced HIV
Antiviral Recommendations	See table below
Surveillance	State regulations require the reporting of influenza cases to the health department within 7 days.

Antiviral Agent	Trade Name	Flu type	Use	Age Restrictions
Amantadine	Symmetrel®	A	Prophylaxis/ Treatment	≥1 year
Rimantadine	Flumadine®	A	Prophylaxis/ Treatment	Only adults for treatment ≥1 year for prophylaxis
Zanamivir	Relenza®	A and B	Treatment only	≥7 years
Oseltamivir	Tamiflu®	A and B	Prophylaxis/ Treatment	≥1 year for treatment ≥13 years for prophylaxis
Treatment: Can reduce duration of uncomplicated illness if given within 48 hours of symptom onset.				

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment
www.vdh.virginia.gov

For more information, refer to: Centers for Disease Control and Prevention. Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices. MMWR 2004; 53 (RR06): 1-39.

Updated 02/03/04

Appendix D. Influenza Infection Control

Influenza viruses are spread from person-to-person, primarily through inhalation of small particle aerosols and large droplet infection. Persons can be infectious starting the day before symptoms begin through approximately five days after illness onset. Children can be infectious for a longer period. The main option for controlling influenza is immunoprophylaxis with the inactivated vaccine. Use of antiviral drugs for prophylaxis and/or treatment is an important adjunct to vaccination.[7]

Special guidelines for infection control should be in place during pandemic influenza, taking into account the likelihood that a high proportion of the population will be affected and that secondary infections are a major source of morbidity and mortality. In physician offices, standard precautions should be followed, with strict adherence to hand washing. Healthcare facilities, in addition to standard precautions, may want to consider the following:

- Staff education: Staff should be educated annually about the prevention and control of influenza, focusing on infection spread. Staff should be reminded that they can spread the virus via their hands or fomites (e.g. towels, medication cart items, etc).
- Hand washing: Hands should be washed after touching blood, body fluids, secretions, excretions, and contaminated items, whether or not gloves are worn. Hands should be washed with plain soap or detergent for at least 10-15 seconds under running water.
- Gloves: Clean, disposable gloves should be worn when touching blood, body fluids, secretions, excretions, and contaminated items. Gloves should be removed after use and before touching any non-contaminated items or touching another patient, and hands should be washed immediately with soap and water or an antiseptic hand-rub.
- Masks: Healthcare workers and visitors should wear masks when they are within three feet of the patient, and the patient should wear a mask when being transported.
- Bed Management: Consideration should be given to cohorting ill patients, since private rooms are not likely to be available for influenza patients during a pandemic. Movement and transport of patients should also be limited as much as possible.

Long-term care facilities may take the following measures to control outbreaks of influenza:

- Staff should call the health department if an increase in cases of respiratory illness is observed, especially if it is associated with an increase in hospitalizations or deaths. Maintain a heightened surveillance for febrile and respiratory illness among residents and staff.
- Staff should be assigned to work with either sick or well patients, but not circulated between both groups. Staff should not work while ill.
- Visitation should be restricted during outbreaks.
- If admissions are restricted due to an outbreak, when admissions resume, any new admissions should receive antivirals prophylactically until one week after the outbreak is over. If possible, they may begin taking the antivirals for 2-3 days prior to admission.
- Vaccinate any residents or staff who are unvaccinated. Recommend use of antiviral medications while antibodies develop.
- Separate residents taking antiviral medications for treatment from other residents.

In some circumstances, such as a novel virus alert, public health officials may advise that certain patients should be managed under contact and airborne precautions. This may happen if a novel virus is isolated in humans and the possibility of person-to-person transmission cannot be ruled out. In such circumstances, healthcare facilities should initiate the following additional precautions for patients hospitalized with or under evaluation for infection with a novel virus:

- Gloves and gowns: Clean, disposable gloves and gowns should be worn for all patient contact.
- Eye protection: Routinely wear eye protection when within 3 feet of patient. If splash or spray of respiratory secretions or other body fluids is likely, protect the eyes with goggles or a face shield. The face shield should fully cover the front and wrap around the side of the face. Corrective eyeglasses or contact lenses alone are not considered eye protection.
- Isolation: Place the patient in an airborne isolation room (e.g., monitored negative air pressure in relation to the surrounding areas with 6 to 12 air changes per hour).
- Masks: Use a fit tested respirator, at least as protective as a NIOSH-approved N-95 filtering facepiece respirator when entering the room.
- Patient transport: Limit patient movement and transport outside the airborne isolation room to medically necessary purposes. If patient movement or transport is necessary, ensure that the patient wears a surgical mask, puts on a clean patient gown, and performs hand hygiene before leaving the room. If a mask cannot be tolerated, apply the most practical measures to contain respiratory secretions.

Appendix E. Influenza Antivirals: Overview for Healthcare Providers

Amantadine Manufactured under the trade name Symmetrel® by Endo Laboratories Also available in generic forms	• Used to treat uncomplicated illnesses due to influenza A in individuals 1 year of age and older (must be given within two days of illness onset) • Used prophylactically to reduce chance of getting influenza A in individuals 1 year of age and older (approximately 70%-90% effective) • Also used in the treatment of Parkinson's disease and drug-induced extrapyramidal reactions • Available in tablet or syrup form • Adverse reactions reported most frequently include nervousness, anxiety, difficulty concentrating, lightheadedness and insomnia • More serious but less frequent side effects including behavioral changes, delirium, hallucinations, agitation, and seizures have been observed most often among individuals with renal insufficiency, seizure disorders, or certain psychiatric disorders • Should not be used for patients with untreated angle closure glaucoma because of anticholinergic effects • To reduce the emergence of antiviral drug-resistant viruses, amantadine therapy for treatment of influenza should be discontinued as soon as clinically warranted, typically after 3-5 days of treatment or within 24-48 hours after disappearance of signs and symptoms
Rimantadine Manufactured under the trade name Flumadine® by Forest Laboratories Also available in generic forms	• Used to treat uncomplicated illnesses due to influenza A in adults (must be given within two days of illness onset) • Used prophylactically to reduce chance of getting influenza in individuals 1 year of age and older (approximately 70%-90% effective) • Available in tablet or syrup form • Adverse events reported most frequently include nervousness, anxiety, difficulty concentrating, lightheadedness, and insomnia. • More serious but less frequent side effects including behavioral changes, delirium, hallucinations, agitation, and seizures have been observed among most often individuals with renal insufficiency, seizure disorders, or certain psychiatric disorders • To reduce the emergence of antiviral drug-resistant viruses, rimantadine therapy for treatment of influenza should be discontinued as soon as clinically warranted, typically after 3-5 days of treatment or within 24-48 hours after disappearance of signs and symptoms
Zanamivir Manufactured under the trade name Relenza® by GlaxoSmithKline	• Used to treat uncomplicated illnesses due to influenza A and B in individuals 7 years of age and older (must be given within two days of illness onset) • Not used to prevent the flu or to decrease the risk of transmitting the virus to others • Available as a dry powder, inhaled twice a day from a breath-activated plastic device included in the package with the medication • Some patients, especially those with asthma or chronic obstructive pulmonary disease (COPD), have had bronchospasms or serious breathing problems after using zanamivir • Zanamivir is not recommended for patients with underlying airway disease; if physicians prescribe it after careful consideration of risks and benefits, the drug should be prescribed under careful monitoring and supportive care, including the availability of fast acting bronchodilators. • Side effects, in addition to bronchospasms, may include headache, diarrhea, nausea, bronchitis, cough, sinus inflammation, infections of the ear, nose, and throat, and dizziness. • Recommended duration of treatment is 5 days
Oseltamivir Manufactured under the trade name Tamiflu® by Hoffman-LaRoche , Inc.	• Used to treat uncomplicated illnesses due to influenza A and B in individuals 1 year of age and older (must have been given within two days of illness onset) • Used prophylactically to reduce the chance of getting influenza in persons 13 years of age and older (approximately 70%-90% effective) • Available in capsule or oral suspension form • Possible side effects include nausea and vomiting. Side effects are similar whether oseltamivir is taken for treatment or prophylaxis • Recommended duration of treatment is 5 days

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment
www.vdh.virginia.gov

Note. Information was taken from: Centers for Disease Control and Prevention. Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices. MMWR 2004; 53 (RR06): 1-39.

Updated 06/22/05

Appendix F. State Health Department Activities

Interpandemic Period: During this period, no new influenza virus subtypes have been detected in humans.

- Develop electronic and telecommunications capability within VDH, with neighboring jurisdictions and with the Centers for Disease Control and Prevention (CDC).
- Division of Immunization should finalize memoranda of agreement with storage and shipment facilities.
- Assess ways to improve immunization rates for influenza and pneumococcal vaccines.
- Develop risk communications messages targeted for pandemic influenza.
- Develop and test pandemic influenza surveillance, investigation, and control procedures.
- Division of Surveillance and Investigation (DSI) will develop guidance for local health departments, schools, hospitals, and clinics in preparing for pandemic influenza.
- DSI will coordinate VDH and CDC sentinel provider surveillance during the regular influenza season (October-April), ensuring participation of at least one provider per 250,000 population. The sentinel providers will continue to be encouraged to send specimens collected from patients with influenza-like-illness at the beginning, middle, and end of the season to DCLS for testing.
- The VDH Office of Epidemiology will review and revise the Pandemic Influenza Response Plan as needed.
- Partner with DCLS to enhance lab surveillance to detect new influenza variants. DCLS will continue to isolate and subtype influenza viruses received during the influenza season and year-round.
- Investigate and respond to influenza outbreaks. Partner with DCLS for laboratory testing of outbreak strains.
- Maintain ongoing communication with the Virginia Department of Agriculture and Consumer Services (VDACS) regarding epizootic and zoonotic disease that may affect human health.
- Emergency Preparedness and Response (EP&R), in partnership with DSI, will convene regular meetings of a Pandemic Influenza Advisory Committee, to discuss and provide recommendations about important issues, such as prioritization of the vaccine and antiviral supplies.
- Provide outreach and information to public health officials, politicians, and the media about issues related to pandemic influenza.
- VDH will partner with the Department of Mental Health, Mental Retardation and Substance Abuse Services (DMHMRSAS) to develop template messages that address fear and other psychological reactions to an influenza pandemic.

Pandemic Alert Period, Phase 3: This stage of planning is active when there have been human infections with a new subtype, but no human-to-human spread is evident (or at most rare instances of spread to a close contact).

- Notify Local Health Departments (LHD) and other stakeholders of a novel virus alert.
- Partner with LHDs to increase case detection among persons who recently traveled to outbreak area(s) and present with clinical illness possibly caused by influenza including pneumonia, acute respiratory distress syndrome, or other severe respiratory illness.
- Notify the Virginia Department of Emergency Management (VDEM) and the Office of Emergency Medical Services (OEMS) of novel virus alert.
- Monitor bulletins from CDC or World Health Organization (WHO) regarding clinical, epidemiological, and virologic characteristics of novel variant and disseminate to LHD, stakeholders and partners.

- Partner with DCLS to enhance lab surveillance to detect the appearance of new influenza variants in Virginia.
- If a novel virus is identified in a Virginia resident, work with the local health department to conduct an epidemiologic investigation and determine possible exposure source(s), risk factors, and symptoms. Identify contacts, place under surveillance for illness, and work with the laboratory to determine whether testing of contacts is appropriate.

Pandemic Alert Period, Phase 4: This stage of planning is active when small clusters with limited human-to-human transmission are identified, but spread is highly localized.

- Work with CDC to determine which groups are at high-risk for morbidity and mortality.
- Work with LHD and private sector providers to ensure that identified high-risk groups and others receive vaccine and antiviral medications, as appropriate.
- Activate procedures to procure public sector vaccine. Store vaccine in pre-selected areas.
- Work with providers and the DCLS to increase testing for influenza viruses, including pandemic strain(s), in specimens referred by LHD from travelers to pandemic areas.
- Send representative and unusual virus isolates to CDC for appropriate testing (to include antiviral resistance studies).
- Activate special surveillance for influenza, including increased surveillance in travelers returning from areas with human-to-human transmission.
- Continue to monitor bulletins from CDC or WHO regarding clinical, epidemiological, and virologic characteristics of novel variant, and update LHD, stakeholders, and partners, as appropriate.
- Review and revise drafts of public information documents (fact sheets and guidelines).
- Review vaccine distribution plans with stakeholders and partners, and modify as needed.
- Monitor availability and coordinate distribution and delivery of public-sector vaccines.
- Prepare translated versions of major public information documents for non-English speaking persons.

Pandemic Alert Period, Phase 5: This phase is active when there are larger clusters of illness, with localized spread of disease, suggesting that the virus is becoming increasingly better adapted to humans.

- Notify state agencies and other partners of the potential for an influenza pandemic.
- Continue to monitor bulletins from CDC or WHO regarding clinical, epidemiological, and virologic characteristics of novel variant. Update LHD, stakeholders, and partners.
- Implement surveillance and data collection for adverse events following use of antivirals and drug-resistant strains of influenza.
- Coordinate surveillance activities and findings with other states and federal agencies.
- Participate in special studies as requested by CDC.
- Maintain current listings of public-sector vaccine distribution sites within Virginia.
- Request that OCME provide DCLS with selected autopsy specimens for influenza testing.

Pandemic Period: During this phase, there is increased and sustained transmission in the general population.

- Institute control measures in accordance with CDC and other federal recommendations.
- Ensure that the Emergency Operations Center (EOC) and key health officials are kept informed of all health and medical developments and decisions during pandemic.
- Monitor availability and coordinate distribution and delivery of public-sector vaccines.
- Monitor health impacts, including deaths and hospitalizations, in sentinel hospitals.
- Coordinate activities with other states and federal health agencies.

- Continue to monitor bulletins from CDC and WHO regarding clinical, epidemiological, and virologic characteristics of novel variant. Update LHD, stakeholders, and partners.
- Coordinate release of health information with VDEM and Public Information Officers.
- VDH will partner with DMHMRSAS to provide information and counseling support services to emergency responders, medical personnel and others who may be affected by pandemic influenza.
- Monitor antiviral adverse events weekly and transmit information to CDC so that unexpected adverse events can be detected early and antiviral recommendations altered according to federal recommendations.
- Work with DCLS to send selected influenza A isolates to CDC for antiviral resistance testing so that resistance prevalence can be estimated and appropriate antiviral use recommendations made.
- Participate in special studies as requested by CDC and others in order to: describe unusual clinical syndromes, describe unusual pathologic features associated with fatal cases, conduct efficacy studies of vaccination or chemoprophylaxis, and to assess the effectiveness of control measures.

Second Wave: During this phase, a recurrence of epidemic activity within several months following the initial wave of infection occurs.

- Continue all activities listed under Pandemic phase.
- Review, evaluate and modify as needed, the VDH pandemic response. Update VDEM.
- Review and update communication messages for providers and the public.
- Continue to procure vaccine.
- Monitor resources and staffing needs.

Pandemic Over: This phase marks the cessation of successive pandemic "waves" accompanied by the return of a more typical wintertime epidemic (in the United States).

- Summarize findings and report to Secretary of Heath and Human Services on the epidemiological characteristics of the pandemic in Virginia and on the lessons learned.
- Assess state capacity to resume normal public health function and health care delivery.
- Report results of assessment to Secretary of Health and Human Services.

Appendix G. Checklist for Local Health Departments

Interpandemic Period: During this period, no new influenza virus subtypes have been detected in humans.

- ❑ Provide outreach and information to public health officials, politicians, and the media about issues related to pandemic influenza.
- ❑ Identify the most effective communication channels for reaching different communities within the jurisdiction.

Emergency Planner:

- ❑ Review current emergency plans for inclusion of provisions for mass vaccination campaigns. Include security aspects in partnership with local law enforcement authorities.
- ❑ Conduct a county-wide space and site resource inventory. Determine the availability of shelters, firehouses, schools, gymnasiums, nursing homes, day care centers, and other potential sites for aggregate care. Work with hospitals in your jurisdiction to identify appropriate sites to serve as triage centers, treatment centers, mass vaccination sites or as holding areas for acutely ill patients not able to be admitted to an acute care hospital. Make arrangements with owners of each facility to use the site, if necessary, to care for ill persons during a pandemic.
- ❑ Identify facilities/resources with sufficient refrigerated storage to serve as temporary morgues, if necessary. Develop a plan for management of bodies when morgue capacity has been exceeded.
- ❑ In coordination with the state office, devise a plan for local distribution and administration of public-sector vaccine.
- ❑ Work with local private and volunteer organizations to develop and synchronize local response to a pandemic of influenza.
- ❑ Coordinate planning with other public health disaster planning at the local level.

District Epidemiologist and/or other communicable disease staff:

- ❑ Review policies and procedures to find and remove any barriers to the annual influenza or pneumococcal vaccination programs. Work with local health care facilities to assess and improve health care worker immunization levels.
- ❑ Educate staff about the nature and significance of pandemic influenza and the local response.
- ❑ Establish a means of rapid, two-way communication between local health department and hospitals (infection control practitioners and emergency department directors).
- ❑ Contact physicians in your community to see if they would be interested in participating in the Sentinel Physician Surveillance System.
- ❑ Review emergency department capacity, number of hospital beds, number of intensive care unit beds, quantity of ventilators, morgue capacity, and number of health care providers available to see patients. Use FluAid and FluSurge, software programs developed by the Centers for Disease Control and Prevention, to project the impact of pandemic influenza on localities and hospitals within the health district.
- ❑ Investigate opportunities to work with hospitals, health systems and/or physicians to analyze daily reports of influenza-like illness in patients. Analysis could be conducted as a part of syndromic surveillance activities. Discuss mechanisms for the local health department to obtain data related to the number of emergency department visits, hospitalizations, intensive care unit admissions and hospital deaths due to influenza during a pandemic.

Pandemic Alert Period, Phase 3: This stage of planning is active when there have been human infections with a new subtype, but no human-to-human spread is evident (or at most rare instances of spread to a close contact).

- Notify hospitals and local private and public partners of novel virus alert.
- Notify local emergency management director of novel virus alert.
- Disseminate bulletins received from the CDC or state office regarding clinical, epidemiological, and virologic characteristics of variant strain.
- Work with Sentinel Providers and others to collect specimens for submission to DCLS in order to detect the presence of variant strains in Virginia, particularly individuals who present with influenza-like-illness and have a recent travel history to a region where the novel strain of influenza has been identified.
- If a novel virus is identified in a resident, conduct an epidemiologic investigation and determine possible exposure source(s), risk factors, and symptoms. Identify contacts, place under surveillance for illness, and work with the laboratory to determine whether testing of contacts is appropriate.

Pandemic Alert Period, Phase 4: This stage of planning is active when small clusters with limited human-to-human transmission are identified, but spread is highly localized.

- Review pandemic influenza response plans.
- In coordination with the state office, update hospitals, emergency medical services (EMS), local law enforcement, and local, private and public partners.
- Ensure that high-risk groups and others receive vaccine and antiviral medications, as appropriate.

Pandemic Alert Period, Phase 5: This phase is active when there are larger clusters of illness, with localized spread of disease, suggesting that the virus is becoming increasingly better adapted to humans.

- Review plan for distribution of public sector vaccine.
- Provide state office with lists of public vaccine distribution sites.
- Enhance collection of clinical specimens and transport to the state laboratory.
- Contact private partners to review their plans for distribution and administration of private-sector vaccine.
- Finalize surveillance plans with area hospitals outlining mechanisms to obtain data on: number of emergency department visits, number of hospitalizations, number of intensive care unit admissions and number of hospital deaths related to influenza.

Pandemic Period: During this phase, there is increased and sustained transmission in the general population.

- Coordinate use of available local resources during pandemic, including private, public, and volunteer resources.
- Report pandemic-related information, including influenza data obtained from hospitals, regularly to the VDH Division of Surveillance and Investigation (DSI).
- Assess effectiveness of local response and available local capacity.
- Administer vaccine once it becomes available.
- Work with hospitals to monitor emergency departments for influenza activity, including a review of emergency department visits, hospital admissions, and hospital deaths.

Second Wave: During this phase, a recurrence of epidemic activity within several months following the initial wave of infection occurs.

- Continue all activities listed under Pandemic phase.
- Review, evaluate, and modify as needed, the local pandemic response.

- Report pandemic-related information regularly to DSI.
- Continue to vaccinate.
- Monitor resources and staffing needs.

Pandemic Over: This phase marks the cessation of successive pandemic "waves" accompanied by the return of a more typical wintertime epidemic (in the United States).

- Assess local capacity to resume normal public health functions.
- Assess local capacity to resume normal health care delivery.
- Assess fiscal impact of pandemic response.
- Report results of assessment to local government authorities.
- Report results of assessment to state office.
- Modify the local Pandemic Influenza Response Plan based on lessons learned.

Appendix H. Outpatient Visit Rates, Hospitalization Rates, Death Rates and High-Risk Percentages Used for Pandemic Influenza Morbidity and Mortality Projections

Outpatient Visit, Hospitalization and Death Rates Per 1,000 Population By Age Group

Age Group	Outpatient Visit Rate	Hospitalization Rate	Death Rate
High-Risk			
0 –18	346.00	2.90	0.22
19 – 64	109.50	2.99	2.91
65+	104.50	8.50	4.20
Non High-Risk			
0 –18	197.50	0.50	0.02
19 – 64	62.50	1.47	0.04
65+	59.50	2.25	0.42

Percentages of the Virginia Population Assumed to be at High-Risk for Complications from Pandemic Influenza*

Age Group	Percentage of Population
0 –18	6.4%
19 – 64	14.4%
65+	40.0%

*High-risk percentages are based on the Advisory Committee on Immunization Practices definition of groups at high-risk for complication of influenza infection.

Outpatient visit rates, hospitalization rates, death rates and percentages of high-risk individuals were taken from: Meltzer MI, Cox NJ, Fukuda K. Modeling the Economic Impact of Pandemic Influenza in the United States: Implications for Setting Priorities for Intervention. Background Paper, April 30, 1999.

Appendix I. Draft of Potential Risk Communications Messages

Targeted for Pandemic Influenza

Key messages: 7–9 second sound bites (21 – 27 words)

- Because we are faced with a limited supply of vaccine, it is vital that we look at ways to do the most good for the most people.
- To make sure healthcare providers are available to be there to care for those who develop influenza, it is imperative that we vaccinate healthcare workers immediately.
- To ensure that our community is safe and has water, electricity and other services we all rely on, we must prioritize vaccinating essential services workers.
- (*Fill in age group)*-olds are more seriously affected by this strain of influenza. They are most at risk and, therefore, must be vaccinated early on.
- Although this vaccine has not been approved by the FDA and will be given as an investigational new drug, its benefit far outweighs the associated risks.

Supporting Facts:

(1) Track case numbers and mortality by age group and by locality.

(2) Identify groups of essential services workers.

(3) Develop clear explanations of risks associated with both the disease and the vaccination.

Credible community sources that will validate this key message:

Relationships should be developed with infectious disease specialists in each region of the state now. Agreement should be established that if a pandemic occurs, they will participate in regular conference calls so that we can update them on a regular basis.

Updated 8-15-02

Appendix J. Protocol for the Collection and Submission of Specimens for Isolation and Identification of Influenza and Other Viruses

[September, 2004]

DCLS will provide the collection materials and testing services in support of state and federal influenza monitoring and outbreak investigation programs. It also provides collection materials and testing for other viruses as listed in the table below.

Specimen Collection Kits: Isolation kits are prepared by DCLS and may be obtained from the Sample Kit Office at (804) 648-4480 ext.103

Isolation Collection Kit Contents:

1. Sterile Viral Transport Broth **Store at 2º – 30˚C (36-86˚F). Do not use if turbid**.
2. One viral collection swab
3. One small sealable specimen bag
4. One set of instructions
5. Metal container or Plastic Pressurized Vessel (**Do <u>not</u> place labels on these containers.)**
6. Large sealable, biohazard plastic shipping bag (8" x10") [with "Attn: Viral Isolation" label] with pouch and absorbent pad.
7. Reference request/reporting form (DGS form # -22-164[Rev.1/89])
8. One cold pack (Store frozen so it will be ready for transport.)
9. One styrofoam cooler and one return address label
10. Pre-paid FedEx mailing label **(Supplied <u>only</u> to the Influenza Program Sentinel Physicians.)**

Nasal Wash collection kit (*sent only by request*)

1. One 5 cc syringe
2. Sterile screw-cap urine cup
3. Sterile Saline

Instructions for Specimen Collection: <u>ISOLATION SPECIMEN SHOULD BE COLLECTED WITHIN 48 HOURS OF ONSET OF ILLNESS.</u> Each isolation kit provides enough material to sample one patient. Collect specimen as close to clinical onset as possible and ship quickly to the lab using provided cooler *and* cold pack. Collection of specimens for a nursing home outbreak should be conducted through the local Health Department. A selective sampling of the most recently ill individuals may be considered in these outbreak scenarios. Appropriate specimens for virus isolation are listed below:

Virus	Optimal Specimen for Collection
Influenza, Parainfluenza, Respiratory Syncytial Virus	Nasopharynx
Adenovirus	Nasopharynx, Rectal swab, Stool, Conjunctival swab
Herpes Simplex Virus and Varicella Zoster Virus	Mucocutaneous lesion, Conjunctival swab, Brain biopsy
Enterovirus	CSF, Throat, Rectal swab, Stool (feces), Heart tissue, Mucocutaneous lesion
Cytomegalovirus	Throat, Biopsy tissue, Urine

<u>Reference: Manual of Clinical Microbiology</u>, 8th Edition, American Society for Microbiology.

Collection Procedures for Various Specimens:

1. **Nasopharyngeal Wash *<u>(Use only sterile saline to collect wash)</u>***

- Obtain collection materials and bring saline to room temperature.
- Instruct the patient to sit with head slightly tilted (70 degree angle) backward and to hold the sterile collection cup.
- Instruct the patient on how to constrict the muscles at the back of the throat by saying "K" sound rapidly and repetitively. Inform the patient that this process may prevent the saline from draining down the throat.
- Fill the 5 cc syringe with sterile saline. Gently push the tip of the patient's nose back with your thumb and quickly inject 1 to 2 cc of saline into each nostril.

- Instruct the patient to contain the saline in the nostril for approximately 10 seconds while repetitively saying the “K” sound. After 10 seconds, ask the patient to tilt his/her head forward and collect the saline in the sterile cup.
- Pour as much of the saline collected from the patient as possible into the vial containing the transport broth, cap and seal tightly.
- Label the tube with the patient’s name and date of collection. Complete the request form (DGS form # -22-164[Rev.1/89]) and refrigerate the specimen until packaging for transport.

2. Nasopharyngeal Swab

- Instruct the patient to sit with head slightly tilted backwards. Gently push the tip of the patient’s nose back with your thumb.
- Insert the nasopharyngeal swab into the nostril back to the nasopharynx. The patient’s eyes will momentarily tear. Slowly rotate the swab as it is being withdrawn.
- Repeat this process using the same swab in second nostril to collect from the nasopharynx.
- Insert the swab into the transport tube bending the wire if necessary to fit completely inside the vial. The broth should cover the tip of the swab in the vial. Tightly cap the vial.
- Label the tube with the patient’s name and date of collection. Complete the request form (DGS form # -22-164[Rev.1/89]) and refrigerate the specimen until packaging for transport.

3. Mucocutaneous Lesion

- Carefully puncture the vesicle to expose the fluid within it with a sterile needle (not provided).
- Gently blot up the released fluid with the sterile swab.
- Swab vigorously (without producing bleeding) the exposed base of the lesion to remove infected epithelial cells.
- Insert the swab into the transport tube bending it, if necessary, to fit completely inside the vial. Tightly cap the vial.
- Label the tube with the patient’s name and date of collection. Complete the request form (DGS form# -22-164[Rev.1/89]) and refrigerate the specimen until packaging for transport.

4. Cerebrospinal Fluid (CSF)

- Collect approximately 3 to 5 ml of spinal fluid and place in a sterile tube (not provided). Tightly cap to prevent leaking in transit.
- Label the tube with the patient’s name and date of collection. Complete the request form (DGS form # -22-164[Rev.1/89]) and refrigerate the specimen until packaging for transport.

5. Stool and Rectal Swab

- Place the feces (about the size of a dime) into a sterile urine cup (not provided). If collecting with swab, insert the provided swab 4 to 6 cm. into the patient’s rectum. Gently rub the swab against the mucosa to retrieve cellular and fecal material. Place swab into viral transport vial, cap and seal tightly.
- Label the cup or tube with the patient’s name and date of collection. Complete the request form (DGS form # -22-164[Rev.1/89]) and refrigerate the specimen until packaging for transport.

Instructions for Specimen Transport:

- ❑ Ensure specimens are properly labeled and request forms have been completed before transport.
- ❑ Place labeled specimens in small specimen bag along with absorbent packing material and seal bag; then place in metal container or pressurized vessel and securely screw on lid. Place metal container or pressurized vessel containing the specimen in large biohazard shipping bag. Seal the large shipping bag. Place form in the pocket of the shipping bag.
- ❑ Place bagged specimens in the cooler with frozen cold pack to **keep specimen refrigerated** (increases chance of viral recovery). Seal cooler for shipment to lab and affix correct address label to cooler.

- Ship specimens without delay. **SPECIMENS MUST BE DELIVERED TO THE LABORATORY WITHIN 72 HOURS OF COLLECTION.**
- Each shipment of specimens from a submitter must comply with shipping regulations detailed in IATA 1.5 and 49 CFR Section 1720700 [U.S. Department of Transportation.]
- Send specimens to lab by courier or Federal Express. Use the following address on all packages:

Department of General Services
Division of Consolidated Laboratory Services
Specimen Receiving, Room 155
600 North 5th Street
Richmond, VA 23219-3691
ATTN: Viral Isolation

Result Reporting: Routine monitoring results are mailed to submitter and the Office of Epidemiology. When alerted of a medical emergency or an outbreak, results will be telephoned to the submitter and to the Office of Epidemiology if a reporting telephone number was provided.

Specimen Rejection: Specimens that exceed holding time or temperature requirements, specimens not labeled or incorrectly labeled, specimens with insufficient volume, or specimens collected in isolation kits *not supplied* by DCLS may be rejected.

Requests for Additional Information or Specimen Collection Questions: For additional information or questions, please call (804) 648-4480 ext. 272. To order collection kits, please call (804) 648-4480 ext. 103. **t:\isolation\viralisolationsubmissionprotocol2004**

Appendix K. References

[1] DRAFT Pandemic Influenza Preparedness and Response Plan, Department of Health and Human Services, Annex 6, August 2004.

[2] World Health Organization Global Influenza Preparedness Plan, Department of Communicable Disease, Surveillance and Response, Global Influenza Programme, 2005.

[3] Meltzer MI, Shoemake HA, Kownaski M, Crosby R, 2000. FluAid 2.0: A manual to aid state and local-level public health officials plan, prepare and practice for the next influenza pandemic (Beta test version). Centers for Disease Control and Prevention, U.S. Department of Health and Human Services.

[4] Meltzer MI, Cox NJ, Fukuda K. The Economic Impact of Pandemic Influenza in the United States: Priorities for Intervention. Emerging Infectious Diseases. Vol 5, No 5, September-October 1999.

[5] Meltzer MI, Cox NJ, Fukuda K. Modeling the Economic Impact of Pandemic Influenza in the United States: Implications for Setting Priorities for Intervention. Background Paper, April 30, 1999.

[6] Farrell, J. Division of Immunization, Office of Epidemiology, Virginia Department of Health.

[7] CDC. Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices. MMWR 2004; 53(RR-6): 1-39.