

Specimen Submission Guidelines for Pathologic Evaluation of Influenza Virus Infections

Viral antigens may be focal and sparsely distributed in patients with influenza, and are most frequently detected in respiratory epithelium of large airways. Larger airways (particularly primary and segmental bronchi) have the highest yield for detection of influenza viruses by immunohistochemistry (IHC) staining. Collection of the appropriate tissues ensures the best chance of detecting the virus by immunohistochemical stains. Performance of specific immunohistochemical, molecular, or other assays will be determined using clinical and epidemiologic information provided by the submitter and the histopathologic features identified in the submitted tissue specimens.

Collection of Tissue Specimens

The preferred specimens would be a minimum of 8 blocks and fixed tissue specimens representing samples from the following pulmonary sites in addition to specimens from other organs showing pathology. Formalin-fixed paraffin embedded blocks made from BAL can also be submitted for IHC staining. Fresh-frozen tissue may be submitted for culture and molecular-based assays. The recommended pulmonary sites include:

1. Central (hilar) lung with segmental bronchi, right and left primary bronchi, trachea (proximal and distal)
2. Representative pulmonary parenchyma from right and left lung.
3. For patients with suspected myocarditis, encephalitis, or rhabdomyolysis, specimens should include myocardium (right and left ventricle), CNS (cerebral cortex, basal ganglia, pons, medulla, and cerebellum), and skeletal muscle, respectively.
4. Specimens should be included from any other organ showing significant gross or microscopic pathology.

Submission of Specimens

Paraffin-embedded tissue blocks

In general, this is the preferred specimen and is especially important to submit in cases where tissues have been in formalin for a significant time. Prolonged fixation (>2 weeks) may interfere with some immunohistochemical and molecular diagnostic assays.

Wet tissue

If available, we highly recommend that unprocessed tissues in 10% neutral buffered formalin be submitted in addition to paraffin blocks.

Unstained slides

Although not optimal, if paraffin blocks are unavailable it may be possible to utilize unstained sections cut at 3–5 microns (10 slides per block) for immunohistochemistry and specials stains but *not* molecular diagnostic assays (e.g. PCR).

Fresh-frozen tissue

Send separately on dry ice

Electron Microscopy (EM) specimens

Samples fixed in glutaraldehyde and held in phosphate buffer. Sample containers are filled to the top with phosphate buffer and sent on wet ice. Do not freeze. Epoxy-embedded tissues are also accepted.

Please refer to our [General Guidelines for Shipping Pathology Specimens](#) (next page).

General Guidelines for Shipping Pathology Specimens

Infectious Diseases Pathology Branch

Packaging Guidelines		
Room Temperature	Refrigerated (frozen gel packs)	Frozen (dry ice) §
<ul style="list-style-type: none"> Formalin-fixed wet tissues Formalin-fixed paraffin-embedded blocks * Glass slides with sections from paraffin-embedded blocks Glass slides with smears EM blocks / EM grids 	<ul style="list-style-type: none"> Fresh tissue Blood Wet tissue in EM fixative Stool for EM 	<ul style="list-style-type: none"> Fresh frozen tissue Serum Body fluids (BAL, CSF, urine)

* During the warmer months (June – August), it is advisable to ship the block(s) with a frozen gel ice-pack in order to prevent the melting of paraffin-embedded tissue blocks during transit.

§ When shipping frozen specimens from long distances or from international locations, it is best to use a combination of dry ice and frozen gel ice-packs. The gel ice-packs will remain frozen for a day or two after the dry ice has dissipated.

Shipping Guidelines
<ul style="list-style-type: none"> All packages should be mailed for receipt by Friday. US Federal Holidays should be taken into consideration before mailing specimens. Exceptions can be made for urgent cases <u>with prior approval</u>. Please provide us the shipper's package tracking number(s). Specific regulations for packaging, labeling, and shipping may be found at: <ul style="list-style-type: none"> http://www.cdc.gov/laboratory/specimenmanagement/shipping-packing.html http://www.cdc.gov/biosafety http://www.iata.org/whatwedo/cargo/dangerous_goods/Pages/infectious_substances.aspx

Supporting Documentation
<ul style="list-style-type: none"> Please include <ol style="list-style-type: none"> a cover letter outlining a brief clinical history, including relevant demographic / epidemiologic information a completed CDC Form 50.34 a copy of (a) the autopsy report (preliminary or final) or (b) surgical pathology report copies of pertinent laboratory results (microbiology, hematology, serology, culture, and/or biochemical) images (clinical and/or gross autopsy photos) Include the full name, title, complete mailing address, e-mail address, and telephone and fax numbers of the submitter. This will be the person to whom the final pathology report is addressed.

▶▶ **Advance consultation is REQUIRED concerning the submission of all cases.** ◀◀

All specimens should be addressed to:

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Centers for Disease Control and Prevention (CDC)
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