



Specimen Submission for the Pathologic Evaluation of Influenza Virus Infections



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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 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.

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:

1. **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.
2. **Wet tissue:** If available, we also highly recommend that unprocessed tissues in 10% neutral buffered formalin be submitted in addition to paraffin blocks.
3. **Unstained slides:** Although not optimal, it may be possible to utilize unstained sections cut at 3-5 microns (10 slides per block) if paraffin blocks are unavailable.
4. **Fresh-frozen tissue:** (sent separately on dry ice)

Submission of supporting electronic or hard-copy documentation:

1. Copy of the pathology report (preliminary or final)
2. Copy of any pertinent laboratory reports (microbiology, hematology, serology, culture, and biochemical)
3. Cover letter outlining a brief clinical history and the full name, title, complete mailing address, e-mail address, phone, and fax numbers of the submitter.
4. Images (clinical and/or gross autopsy photos)



**General Guidelines for Shipping
Pathology Specimens**



**Centers for Disease Control and Prevention
Coordinating Center for Infectious Diseases
National Centers for Zoonotic, Vector-Borne & Enteric Diseases
Division of Viral & Rickettsial Diseases
Infectious Diseases Pathology Branch**

Packaging & Shipping Guidelines [§]		
Room Temperature	Refrigerated (frozen gel-packs)	Frozen (dry-ice [¥])
Formalin-fixed wet tissues. Formalin-fixed paraffin-embedded blocks.* Glass slides with sections from paraffin-embedded blocks. Glass slides with smears. PCR sections from paraffin-embedded blocks. EM blocks. EM grids.	Fresh tissue. Blood. Wet tissue in EM fixative. Stool for EM.	Fresh frozen tissue. Serum. Body fluids (BAL, CSF, Urine).

[§] Domestic packages should be mailed Monday-Wednesday for receipt by Friday. International packages should also be mailed so as to be received by Friday. U.S. Federal holidays should be taken into consideration before mailing the packages. Exceptions can be made on urgent cases with prior approval. Please provide us with the shipper's package tracking number(s). Specific regulations for packaging, labeling, and shipping may be found at <http://www.cdc.gov/ncidod/srp/specimens/shipping-packing.html>, http://www.iata.org/whatwedo/cargo/dangerous_goods/infectious_substances.htm, and at <http://www.cdc.gov/od/ohs/biosfty/shipdir.htm>,

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

[¥] 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.

Please include a cover letter outlining a brief clinical history, and a copy of the autopsy report (preliminary or final) or surgical pathology report. Please also include the full name, title, complete mailing address, e-mail address, phone, and fax numbers of the submitter (i.e., the person to whom our final pathology report will be addressed to).

▶▶ Advance consultation is required concerning the submission of all cases, and also the submission of refrigerated and/or frozen specimens. ◀◀

All specimens should be addressed to:

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