Upper respiratory tract (URT) diseases are remarkably common in cats and can be both challenging in the acute state and frustrating in the chronic state. The objective of this review article is to discuss the approach to evaluating a cat with clinical signs attributable to the URT.

CAUSES
A variety of disorders can affect the URT of cats.

- Infectious URT disease (usually viral rhinosinusitis) is by far the most common cause of URT signs.

- Less common causes of URT signs include:
  - Chronic idiopathic rhinosinusitis (noninfectious, inflammatory)
  - Nasopharyngeal polyps, stenosis, foreign bodies, and neoplasia
  - Laryngeal disease
  - Tooth root disease.

   Any of these can cause acute or chronic URT signs.

- Chronic rhinitis refers to rhinitis/rhinosinusitis that persists for longer than 1 month, particularly without signs of systemic disease. These cats are often referred to as chronic “snuffers/sniffers.”

- The most common diagnoses—acute/chronic URT infection and chronic idiopathic rhinosinusitis—are typically considered diagnoses of exclusion.

- Therefore, it is important to thoroughly evaluate cats (especially adults) with URT signs (particularly chronic), because another, more treatable disease may be identified as the source of the signs.

ETIOLOGY & EPIDEMIOLOGY
When considering differential diagnoses for URT signs in cats, it is important to consider the etiopathogenesis and epidemiology of these diseases.

INFECTIONOUS DISEASE
Feline Herpes Virus & Calicivirus
The pathogens that most commonly cause URT infections in cats are viral. Feline herpes virus (FHV) and feline calicivirus (FCV) account for approximately 90% of all feline URT disease.

Risk Factors
- Viral URT disease is especially common in kittens and stressed or immunocompromised adults.
- Most cats with idiopathic chronic rhinitis are thought to have had viral (FHV or FCV) URT infections in early life, although they may not manifest active viral infection as adults.

Transmission
- Pathogens enter through the oral and nasal conjunctiva; FHV and FCV replication occurs in the mucosa of the nasal septum, nasal turbinates, nasopharynx, and tonsils.
- Viral shedding (possibility of transmission to other cats) occurs for at least the duration of clinical signs.
- Many cats continue shedding after resolution of clinical signs. In most, clinical signs resolve within 2 weeks but shedding can continue for another 2 weeks or even lifelong.
Virus Reactivation

- About 80% of cats experience neuronal latency of FHV in the trigeminal ganglion; the virus can then be reactivated due to stress, illness, or immunosuppression (≈ 50% of cats).
- Intermittent reactivation of FHV gives rise to viral shedding in oronasal and conjunctival secretions.
- When reactivation is associated with clinical signs it is termed recrudescence; however, shedding can occur in the absence of clinical signs in cases of chronic, latent FHV infection.

Etiology of Clinical Signs

- Viral URT infection can cause either acute or chronic clinical signs (Figures 1 and 2), depending on the immune status of the affected cat (and potentially other factors).
- Infection is associated with multifocal epithelial necrosis, neutrophilic inflammation, and fibrinous exudation, resulting in “classic” clinical signs.

Prevention

- It is important to note that vaccines are not necessarily protective—they are designed to decrease severity of clinical signs (especially with FCV, due to its great antigenic diversity).
- URT viruses are generally transmitted cat to cat via URT secretions and aerosol transmission over short distances; however, environmental contamination can occur, especially in multicat situations.
  - FHV is susceptible to common disinfectants, antiseptics, and detergents.
  - FCV, however, can persist in the environment for about a month and is resistant to many common disinfectants; bleach is the preferred agent for killing the virus.
- Cats with URT signs should be isolated during their hospital stay in an area with adequate ventilation. Strict hygiene practices should be followed, including bleaching of cages and other items in contact with infected cats.

H1N1 Influenza Virus

H1N1 influenza virus (swine flu) has been identified in cats, receiving some interest given its significance in human medicine.

Naturally occurring H1N1 infection was first documented in cats in 2009 and was associated with the human pandemic. Cats most likely acquired the virus from their human household companions. Thus, the virus is essentially absent from surveyed feral cat populations.

H1N1 infection appears to occasionally result in signs of acute upper and lower respiratory tract disease in cats. Mortality is attributable to severe pneumonia.

Bacterial Infection

Other primary URT pathogens include:

- *Chlamydia psittaci*
- *Mycoplasma felis*
- *M. gatae*
- *Bordetella bronchiseptica*.

Although these can be primary bacterial pathogens, they are more commonly secondary to and concurrent with viral infection. Notably, viral agents damage the respiratory epithelium, especially in young cats, making the cat more susceptible to opportunistic pathogens, such as staphylococci, streptococci, pasteurellae, and coliforms.

Fungal Infection

Fungal infections (eg, nasal cryptococcosis) can also occur.

OTHER CAUSES

Nasopharyngeal Polyps

Nasopharyngeal polyps can cause chronic URT signs.
- These polyps originate in the Eustachian tube or middle ear and are a source of upper airway obstruction.
- While nasopharyngeal polyps are inflammatory in nature, their exact etiology is not known.
- Polyps are generally found in young cats. They are a rare cause of URT signs in older cats; in this age group, neoplastic processes predominate.

Figure 1. Bilateral, moderate serous ocular discharge and marked, mucopurulent nasal discharge in a cat with feline URT disease.

Figure 2. Bilateral, serosanguineous ocular discharge, blepharospasm, and nasal discharge in a 4-year-old, neutered male cat with recrudescence of FHV-1 and associated superficial ulceration and keratoconjunctivitis in both eyes.
Nasal/Nasopharyngeal Tumors
Nasal tumors are a less common cause of URT signs, although require consideration, especially in older cats. As with laryngeal tumors (see Laryngeal Disease), lymphoma, squamous cell carcinoma, and adenocarcinoma should be considered. With the exception of lymphoma, these tumors tend to be locally invasive without distant metastases.16

Nasal Foreign Bodies
Although less common in cats than dogs, cats may suffer from nasal foreign bodies, the majority of which are plant material lodged above the soft palate.16

Nasopharyngeal Stenosis
Fortunately, this is a rare condition. It can be congenital or acquired secondary to chronic infection or aspiration.

Laryngeal Disease
Laryngeal disease is rarely reported in cats, but all ages can be affected. Laryngeal disease may be inflammatory, neoplastic (benign or malignant), associated with trauma, or idiopathic.
• Inflammatory laryngeal diseases are a heterogenous group of conditions, including diffuse neutrophilic or lymphoplasmacytic inflammation and inflammatory polyps.17 The etiology of laryngeal inflammation in cats is not known.
• A variety of laryngeal neoplasms have been reported in cats. Feline immunodeficiency virus (FIV) positive cats are overrepresented.
» Lymphoma and squamous cell carcinoma are most common, but adenocarcinoma and round cell tumor are also found.18,19
» A definitive diagnosis is vital to guide treatment as chemoresponsiveness varies.
» There are a few reports of laryngeal paralysis in cats.20,21 A significant proportion are idiopathic, but paralysis can be secondary to neoplasia, iatrogenic (neck surgery, traumatic intubation), or laryngeal inflammation.

Tooth Root Disease
While dental disease is commonly listed as a cause of URT signs in cats, it is uncommonly reported.22 Tooth root abscesses should be considered a differential diagnosis for cats with URT signs, particularly unilateral discharge with other evidence of dental disease.

CLINICAL SIGNS
Clinical signs are somewhat similar for all feline URT diseases; however, some signs are unique to specific pathogens and/or anatomic locations of pathology (Table 1). As mentioned previously, these diseases may result in acute onset of clinical signs or follow a more chronic course. Physical examination in cats with acute URT infections may be consistent with systemic illness.

### Table 1. URT Disease Clinical Signs

<table>
<thead>
<tr>
<th>Type of Sign</th>
<th>Clinical Signs</th>
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<tbody>
<tr>
<td>Local Signs</td>
<td>• Sneezing and nasal congestion (resulting in open-mouth breathing)</td>
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<td></td>
<td>• Ocular discharge (with potentially more severe ocular signs)</td>
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<td>• Nasal discharge (usually bilateral)</td>
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<td></td>
<td>» Often serous discharge initially; secondary bacterial colonization of nasal</td>
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<td></td>
<td>passages can result in change to mucopurulent discharge</td>
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<tr>
<td></td>
<td>» Encrustation of external nares and eyelids due to large discharge volume,</td>
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<td></td>
<td>dehydration, and poor grooming</td>
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<tr>
<td></td>
<td>• Oral ulceration</td>
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<td></td>
<td>• Stertor or stridor</td>
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<tr>
<td>Systemic Signs</td>
<td>• Fever</td>
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<td></td>
<td>• Lethargy</td>
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<tr>
<td></td>
<td>• Inappetence/anorexia</td>
</tr>
<tr>
<td>URT Disease</td>
<td>Clinical Signs</td>
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<tr>
<td>Feline Calicivirus</td>
<td>• Commonly associated with oral ulceration, which affects tongue, soft palate,</td>
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<td></td>
<td>and fauces</td>
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<td></td>
<td>• Ulcers contribute to ptyalism and oral pain (exacerbating inappetence)</td>
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<tr>
<td>Feline Herpes Virus</td>
<td>• More severe URT clinical signs in general</td>
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<td></td>
<td>• Ocular signs become more marked and chronic, including:</td>
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<tr>
<td></td>
<td>» Blepharospasm</td>
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<td></td>
<td>» Bilateral conjunctivitis</td>
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<td></td>
<td>» Keratitis (persistent or recurrent)</td>
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<td></td>
<td>» Chemosis</td>
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<td></td>
<td>» Superficial ulceration (dendritic ulcers, direct viral cytolysis of cornea)</td>
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<tr>
<td>Fungal Rhinitis</td>
<td>• May result in facial deformity (eg, Roman nose), skin ulceration, and nasal</td>
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<tr>
<td></td>
<td>discharge</td>
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<td></td>
<td>• Often have submandibular lymphadenopathy</td>
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<tr>
<td>Laryngeal Disease</td>
<td>• Increased inspiratory effort (with variable distress) and stridor</td>
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<td></td>
<td>• May display dysphonia, coughing, gagging, and/or retching</td>
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<tr>
<td>Nasopharyngeal Foreign</td>
<td>• Acute onset of sneezing and reverse sneezing</td>
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<tr>
<td>Bodies</td>
<td>• Gagging and swallowing</td>
</tr>
<tr>
<td></td>
<td>• Both of the above result in distress</td>
</tr>
<tr>
<td>Nasopharyngeal Polyps</td>
<td>• Stertorous breathing</td>
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<tr>
<td></td>
<td>• Otitis</td>
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</table>
**DIAGNOSTICS**
Feline URT infection is usually a clinical diagnosis based on history and physical examination (ocular and nasal discharge, stertor, etc).

**FOCUSED DIAGNOSTICS**

**FIV/FeLV Test**
- If the cat has not been recently tested and/or risk factors exist, this test should be performed since URT diseases are associated with immunosuppression.
- Laryngeal neoplasia is also common in FIV positive cats.

**CBC & Serum Biochemical Profile**
- These tests are not usually indicated in cats with acute URT signs in the absence of systemic illness.
- However, they are recommended in cats that are systemically unwell or have chronic clinical signs.

**Polymerase Chain Reaction**
- Polymerase chain reaction (PCR) is the preferred method for virus detection in cats with URT signs; however, it is not standardized among laboratories (and, thus, sensitivity and specificity vary).
- IDEXX (idexx.com) has a Feline Upper Respiratory Disease (URD) RealPCR Panel that tests for FHV, FCV, *Chlamydophila felis*, *M felis*, *B bronchiseptica*, and H1N1 influenza (requires a deep pharyngeal swab and conjunctival swab).

**Other Methods**
Other methods for virus and antigen detection include virus isolation and indirect immunofluorescence antibody assay; however, these are more time consuming and potentially less sensitive than PCR.\(^5\)

**FURTHER DIAGNOSTICS**
Diagnostics for cats with chronic URT signs and/or localizing signs should be more thorough given the broad range of differential diagnoses.\(^2\,^3\,^5\)

**Oral Examination under Anesthesia**
- Fully assesses extent of dental disease and its potential contribution to URT signs and the larynx
- Indicated in cats that have evidence of dental abnormalities during awake oral examination and those with stridor or other clinical signs attributable to the larynx

**Upper Airway Imaging**
- Indicated in cats in which a space occupying lesion or bony lytic lesion is suspected
- Cervical radiographs can be very useful for identifying laryngeal masses in cats with signs attributable to the larynx.
- Ultrasound (ie, echolaryngography) identifies laryngeal masses and dysfunction.\(^5\)
- Dental radiographs can identify and assess tooth root abscesses.

**Computed tomography (CT) and/or magnetic resonance imaging (MRI) is now used (where available) instead of traditional skull radiographs to assess nasal passages and bullae for potential masses, lytic lesions, or polyps. CT remains the preferred modality given its greater bony detail; MRI is preferable for assessing soft tissue.\(^24\)**

**Note:** Imaging should always be performed prior to sampling procedures.

**Rhinoscopy & Nasal Flush**
- Used to assess nasopharyngeal masses, foreign bodies, and stenosis
- Antegrade rhinoscopy is challenging in cats given the small diameter of the nasal passages but can be performed with narrow rigid scopes.

**Retroflex rhinoscopy is more commonly performed to assess the nasopharynx. If a scope is not available, it can be visualized with a spay hook and dental mirror.**

**Note:** Assessment of coagulation status should be done prior to biopsy procedures.

**Other**
A latex cryptococcal agglutination test can be performed when an index of suspicion for fungal rhinitis...
(eg, endemic areas, typical lesions) exists; however, the diagnosis is achieved immediately with cytology.

**TREATMENT**

Treatment of feline URT disease (Table 2) depends on the underlying cause, whether signs or disease is acute or chronic, and extent and severity of systemic illness.

Chronic URT disease can be frustrating to treat since there is commonly no cure unless a diagnosis (eg, tooth root abscess) is reached. If no specific diagnosis is reached, chronic viral infection and/or chronic idiopathic rhinosinusitis is often the default diagnosis.

**PROGNOSIS**

The prognosis for cats with URT signs depends on the nature of the underlying disease.

Feline URT infections are generally associated with high morbidity (especially in at-risk populations) but low mortality; with the exception of FHV, infections are typically self-limiting in young adult immunocompetent cats.

- In contrast, a grave prognosis is associated with moribund kittens and cats with neurologic complications, systemic FCV, viral pneumonia, and concurrent infectious disease, such as panleukopenia.

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### Table 2. URT Disease Treatment

<table>
<thead>
<tr>
<th>Disease Type</th>
<th>Treatment</th>
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<tbody>
<tr>
<td><strong>Acute Disease</strong></td>
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<tr>
<td>• Intravenous fluid therapy for rehydration and maintenance is often indicated.</td>
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<td>• Provision of nutritional support is indicated since most affected cats are profoundly inappetant or anorexic.</td>
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<tr>
<td>• Antibiotics are warranted in many cases for secondary bacterial infection (Table 3).</td>
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<tr>
<td>• The role of systemic antiviral agents is as yet undetermined. One recent report of chronic FHV infection suggested some benefit of oral famciclovir (see Evaluation of Orally Administered Famciclovir in Cats Experimentally Infected with Feline Herpesvirus Type-1, Journal Club, page 86).</td>
<td></td>
</tr>
<tr>
<td>• Isolation is a very important part of management in the veterinary hospital, given the contagious nature of these diseases.16</td>
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| Chronic Disease       |                                                                            |
| • A nasal flush, with or without antibiotics, is one method of long-term management. |
| • Long-course, high-dose antibiotics (eg, clindamycin, 50–75 mg/cat PO Q 12 H for 3–4 months) may be used to manage chronic “snufflers.” |
| • Oral prednisone may help in cases of lymphocytic–plasmacytic inflammation. |
| • Antihistamines are rarely effective, but can be tried as they are unlikely to be harmful.4 |
| • Surgical removal of the turbinates has been described but is a highly invasive procedure and rarely indicated. |

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Treatment</th>
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<tbody>
<tr>
<td><strong>FHV Corneal Lesions</strong></td>
<td>• Topical antiviral agents (eg, trifluridine, idoxuridine, vidarabine) and parenteral L-lysine (200 mg PO Q 12–24 H) have been traditionally recommended; however, recent studies question lysine’s efficacy.25-27</td>
</tr>
<tr>
<td><strong>Nasopharyngeal Polyps</strong></td>
<td>• Simple traction is considered first-line treatment, with an estimated success of ≈ 50%.</td>
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<td>• Ventral bulla osteotomy should be considered if clinical signs recur.14</td>
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<tr>
<td>• Horner’s syndrome is very commonly seen after removal; it tends to be transient, but may be permanent.14</td>
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<tr>
<td><strong>Nasopharyngeal Stenosis</strong></td>
<td>• Balloon dilation and stent placement, although not curative, can be palliative.28-30</td>
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<tr>
<td>• Anti-inflammatory therapy has also been advocated to reduce associated inflammation.</td>
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</tr>
<tr>
<td><strong>Nasopharyngeal Foreign Bodies</strong></td>
<td>• Nasal flushing (often following visualization with retroflex rhinoscopy) is most commonly used for removal of foreign bodies.16</td>
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<tr>
<td><strong>Nasopharyngeal &amp; Laryngeal Neoplasia</strong></td>
<td>• Treatment depends on the type and location of the neoplasm</td>
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<tr>
<td>• Chemotherapy is often used for lymphoma, although it’s associated with systemic side effects.</td>
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<tr>
<td>• Palliative radiation therapy is indicated for other nasal tumors because they are rarely surgically resectable.</td>
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<tr>
<td>• Nonsteroidal anti-inflammatories may be beneficial, although less so for feline squamous cell carcinoma.</td>
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<tr>
<td><strong>Laryngeal Inflammation</strong></td>
<td>• Prednisolone may be used for control of idiopathic laryngeal inflammation.</td>
</tr>
<tr>
<td><strong>Laryngeal Paralysis</strong></td>
<td>• May not require therapeutic intervention given the somewhat sedentary lifestyle of cats.</td>
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<tr>
<td>• Arytenoid lateralization, if required, has reportedly higher complication rates in cats than dogs.21</td>
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</table>
The long-term prognosis for cats with FHV is guarded, since recurrence of ocular and respiratory signs throughout life is common. Ocular complications can include corneal sequestrum, keratomalacia, desmetocoele, and corneal scar formation.

Chronic rhinosinusitis is also associated with high morbidity in individual affected cats.

It is recommended to educate the client early in the course of diagnosis regarding the concept of chronicity and control rather than cure. After turbinates are destroyed, regardless of the inciting cause, these cats remain predisposed to recurrent infection and inflammation. Affected cats will likely always have some dysfunction, such as nasal discharge.

FeLV = feline leukemia virus; FIV = feline immunodeficiency virus; FCV = feline calicivirus; FHV = feline herpes virus; PCR = polymerase chain reaction; URT = upper respiratory tract

References

Antibiotics
- Amoxicillin 10–22 mg/kg PO Q 8–12 H
- Amoxicillin-Clavulanate 13.75 mg/kg PO Q 8–12 H
- Azithromycin 15 mg/kg PO Q 12 H
- Clindamycin 10–12 mg/kg PO Q 12 H
- Doxycycline 10 mg/kg PO Q 24 H

Antifungals
- Fluconazole 50 mg/cat PO Q 12–24 H
- Itraconazole 10 mg/kg PO Q 24 H

Antivirals
- Famciclovir Recommended doses vary:
  62.5–125 mg/cat PO Q 12–24 H
  90 mg/kg PO Q 8–12 H
- Lysine 200-500 mg/cat PO Q 12–24 H

Notes
- Liquid formulations are useful to aid in administration.
- Antifungal drugs should only be used in cases of confirmed fungal etiology.

References


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(Heartworm Hotline continued from page 43)

References