

INFLUENZA

Disease Category: Respiratory disease (seasonal influenza; vaccine-preventable respiratory viral disease)

Timeframe to follow-up:

See the link to the Disease Investigation Process document

Signs and Symptoms

Typical Presentation: Abrupt onset of fever (may not be present in all patients, particularly older adults or immunocompromised individuals), cough (usually nonproductive), sore throat, rhinorrhea, nasal congestion, headache, myalgia, chills, fatigue, and malaise.

Pediatric Variations: Gastrointestinal symptoms (nausea, vomiting, diarrhea) occur in 10–20% of infected children. Otitis media and febrile seizures are also common pediatric complications.

Severe Complications: Primary viral pneumonia, secondary bacterial pneumonia (e.g., *Staphylococcus aureus*, *Streptococcus pneumoniae*), acute respiratory distress syndrome (ARDS), encephalitis, myocarditis, pericarditis, myositis, rhabdomyolysis, multi-organ failure, and exacerbation of underlying chronic medical conditions (e.g., asthma, COPD, CHF).

Special Clinical Note (Novel Influenza A/H5N1): Human infections with Novel Influenza A (e.g., H5N1) may present with atypical clinical signs including conjunctivitis (red eye, discharge), severe lower respiratory illness without prominent upper respiratory symptoms, or acute encephalitis.

Incubation

Usually 2 days; range 1 – 4 days following exposure

Case Classification

Seasonal Influenza-Associated Hospitalization

Clinical Criteria: An acute respiratory illness with signs/symptoms compatible with influenza requiring inpatient hospital admission.

Laboratory Criteria: Demonstration of influenza virus infection via RT-PCR, nucleic acid amplification test (NAAT), viral culture, or rapid diagnostic test from a clinical respiratory specimen.

Confirmed: A patient admitted to a hospital with a positive influenza laboratory test.

Probable: Not used for routine seasonal influenza surveillance reporting.

Novel Influenza A Virus Infection (H5, H7, H9, Swine-Origin, Unsubtypable)

Clinical Criteria: Acute respiratory illness (cough, sore throat, shortness of breath, fever) or conjunctivitis in a person with high-risk exposure (e.g., direct contact with sick/dead poultry, wild birds, raw dairy/unpasteurized milk, or infected livestock/swine).

Suspected: A case meeting clinical and epidemiologic criteria, pending confirmatory testing.

	Probable: A case meeting clinical criteria AND epidemiologically linked to a confirmed human case, but lacking confirmatory lab testing or with inconclusive novel lab results. Confirmed: Laboratory confirmation of a novel influenza A virus via CDC or a CDC-designated state public health laboratory (NSPHL) using CDC-approved RT-PCR or sequencing protocols. 3. Pediatric Influenza-Associated Death Criteria: A death occurring in a person under 18 years of age with a clinically compatible illness and laboratory-confirmed influenza, where no other cause of death is identified.
Differential Diagnosis	Viral Infections: SARS-CoV-2 (COVID-19), Respiratory Syncytial Virus (RSV), Human Metapneumovirus (hMPV), Parainfluenza viruses, Adenovirus, Rhinovirus/Enterovirus, Human Coronaviruses (229E, NL63, OC43, HKU1). Bacterial Infections: Streptococcus pneumoniae, Mycoplasma pneumoniae, Legionella pneumophila, Chlamydia pneumoniae, Haemophilus influenzae (invasive disease).
Treatment	• Early antiviral treatment (e.g., Oseltamivir) is recommended for hospitalized patients, severe or progressive illnesses and people at increased risk for influenza complications. • Supportive care, including hydration, rest, and antipyretics as clinically appropriate.
Duration	Symptoms usually last 3 – 7 days, although cough and fatigue may persist for two weeks or longer. Immunocompromised patients and infants may shed virus and experience prolonged illness lasting several weeks.
Exposure	Transmission occurs primarily through respiratory droplets and infectious respiratory particles during close contact with an infected person. Exposure commonly occurs in households, schools, workplaces, healthcare facilities, and other congregate settings. For Novel Influenza A risk: Assess direct or close exposure to wild aquatic birds, domestic poultry, sick/dead animals, infected livestock, raw/unpasteurized milk or dairy products, or occupational exposures during the 1 – 10 days prior to illness onset.
Laboratory Testing	Local Health Authority can arrange testing if an outbreak is suspected OR for contacts: • Molecular assays (RT-PCR/NAAT) are the preferred diagnostic tests. • Refer to the Nevada State Public Health Laboratory (NSPHL) Influenza Screen and Sub-Typing (NAAT) guidance for specimen collection and submission requirements.

<u>Control of Contacts</u>	Influenza is transmitted person-to-person. Routine exclusion of asymptomatic contacts is generally not required. Symptomatic contacts should remain home while ill, be evaluated when appropriate, and people at high risk for complications may be considered for antiviral chemoprophylaxis according to current CDC recommendations.
Key areas of focus during investigation	• Illness onset date and infectious period. • Hospitalization status and clinical severity. • Influenza vaccination history and antiviral treatment. • Household, school, workplace, healthcare, congregate setting, and travel exposures. • Animal exposures when novel influenza A virus infection is suspected. • Identification of potential outbreaks or epidemiologic links.
Public Health Actions	Reports of reportable influenza conditions must be made to the Local Health Authority in accordance with NAC 441A. Local Health Authority to notify Office of State Epidemiology (dpbhepi@health.nv.gov) or call 775-684-5911/775-400-0333 (after hours) if outbreak suspected. For individual confirmed or probable cases: • Confirm diagnosis, if possible • Identify potential exposures • Prepare a case report and submit to the Chief Medical Officer (through OSE) within 7 days after completing the case investigation • Identify potential outbreaks from common sources • Provide education about how to prevent transmission To the best of the local health authority's ability, each step of the investigation should be completed within one working day or in alignment with NAC 441A.
<u>Key Partner Agencies</u>	• Nevada Office of State Epidemiology (OSE) • Local Health Authorities (LHA) • Nevada State Public Health Laboratory (NSPHL) • Healthcare facilities and infection prevention programs • Centers for Disease Control and Prevention (CDC), when indicated (e.g., novel influenza A virus infections or outbreak investigation) • Nevada Department of Agriculture (when animal or livestock transmission of novel influenza is suspected).

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INFLUENZA

I. DISEASE REPORTING

A. Legal Reporting Requirements

A report to the health authority may be made by telephone; telecopy (in the form prescribed by the health authority); or any form of electronic communication identified by the health authority, following the specified format and procedure.¹

1. *Health Care Providers and Health Care Facilities*

Health providers and facilities must notify the health authority where provider is located within the first working day after identifying the case. Suspected Novel Influenza A virus infections or influenza-associated pediatric deaths must be reported immediately (within 24 hours).¹⁻³

2. *Laboratories*

Laboratories must notify the health authority within the first working day after identifying the case.¹ If the lab is located outside of Nevada, notify the Nevada Chief Medical Officer through the Office of State Epidemiology (OSE) within the same timeframe. Laboratories must immediately report unsubtypeable Influenza R results to OSE and submit the specimen to NSPHL.^{1,4}

3. *Local Health Authority (LHA)*

LHA's must notify the Office of State Epidemiology (OSE) within 7 days after completing the case investigation.⁵

II. [THE DISEASE]

A. Background

Influenza is an acute viral respiratory illness caused primarily by influenza A and influenza B viruses.⁶ Seasonal influenza occurs worldwide and causes annual epidemics, typically during the fall and winter months in the United States. Adults aged 65 years and older, young children, pregnant persons, individuals with chronic medical conditions, and those who are immunocompromised are at greatest risk for severe illness, hospitalization, and death. Since 2010, the Centers for Disease Control and Prevention (CDC) estimates that seasonal influenza has resulted annually in approximately 9.4-51 million illnesses, 120,000-710,000 hospitalizations, and 6,300-52,000 deaths in the United States. Annual influenza vaccination is the primary methods for preventing seasonal influenza and reducing influenza-associated illness and severe outcomes.^{6,7}

B. Etiologic Agent

Influenza is caused by influenza viruses belonging to the family Orthomyxoviridae. Seasonal influenza in humans is caused primarily by influenza A and influenza B viruses. Influenza A viruses are classified into subtypes based on the hemagglutinin (H) and neuraminidase (N) surface proteins, while influenza B viruses are classified into genetic lineages. Novel Influenza A strains emerge when animal-origin Influenza A virus (e.g., Avian H5N1, H7N9, or Swine H1N2v) cross the species barrier and infect humans.⁶

C. Description of Illness

Influenza illness typically begins abruptly with fever, cough, sore throat, rhinorrhea or nasal congestion, headache, myalgia, chills, and fatigue. Most uncomplicated illnesses resolve within several days, although complete recovery may take 10-14 days, and fatigue may persist longer. Gastrointestinal symptoms, including nausea, vomiting, or diarrhea, are uncommon in adults but may occur in 10-20% of children. In cases of Novel Influenza A, symptoms may also include ocular signs such as conjunctivitis, hyperemic conjunctiva, or eye discharge. Complications include viral or secondary bacterial pneumonia, exacerbation of underlying chronic medical conditions, myocarditis, encephalitis, and death. Severe illness is more likely to occur among individuals at increased risk for influenza complications.⁸

D. Disease Burden in Nevada

Influenza is endemic to Nevada and causes seasonal epidemics each year, with activity generally increasing during the fall and winter respiratory virus season. The timing and severity of influenza seasons vary annually depending on circulating influenza strains, population immunity, and vaccine effectiveness. The Nevada Office of State Epidemiology conducts year-round influenza surveillance through laboratory reporting, sentinel provider surveillance, hospitalization surveillance, mortality surveillance, and public health investigations to monitor influenza activity throughout the state.⁹

See the [Nevada Office of State Epidemiology Respiratory Surveillance Dashboard](#) for current influenza surveillance data in Nevada.

E. Reservoirs

Humans are the primary reservoir for seasonal influenza A and influenza B viruses. Wild aquatic birds are the natural reservoir for influenza A viruses and play an important role in the emergence of novel influenza A strains. Other animals, including swine, poultry, and domesticated livestock, may also serve as reservoirs for influenza A viruses capable of infecting humans.⁶

F. Modes of Transmission

Influenza is transmitted primarily through respiratory droplets and infectious respiratory particles generated when an infected person coughs, sneezes, talks, or breathes. Transmission may also occur through direct contact with respiratory secretions and less commonly, through contact with contaminated surfaces followed by touching the eyes, nose, or mouth. Novel Influenza A transmission can occur via direct contact with infected animals, animal waste, unpasteurized milk/raw dairy products, or mucosal exposure to

contaminated dust/droplets in agricultural settings. Most transmission occurs among close contacts.⁶

G. Incubation Period

The incubation period is typically 2 days, with a range of 1 - 4 days following exposure.⁶

H. Period of Communicability

Adults are generally infectious from 1 day before symptoms onset through approximately 5 - 7 days after illness onset. Infectiousness is greatest during the first 3 days of illness. Young children and individuals who are immunocompromised may shed influenza virus for longer periods and remain infectious beyond 7 days.¹⁰

I. Testing

Testing Overview

Laboratory confirmation is recommended when test results will influence clinical management, infection prevention measures, or public health response. Reverse transcription-polymerase chain reaction (RT-PCR) and other molecular assays are the preferred methods for influenza detection because of their high sensitivity and specificity. Rapid influenza diagnostic tests (RIDTs) are available but have lower sensitivity than molecular assays.^{6,11}

Specimen Collection

Preferred specimens include nasopharyngeal or throat swabs collected in viral transport media. Other acceptable respiratory specimens include nasopharyngeal aspirates, sputum, bronchial washings, and bronchoalveolar lavage specimens, as clinically indicated. Specimens should be approximately labeled, refrigerated at 2 – 8° C, and transported according to current Nevada State Public Health Laboratory (NSPHL) submission requirements.

For additional information regarding specimen collection, submission requirements, and influenza testing, refer to the Nevada State Public Health Laboratory Influenza Screen and Sub-Typing (NAAT) guidance.¹¹

J. Treatment

Antiviral treatment is recommended as soon as possible for hospitalized patients, patients with severe, complicated, or progressive influenza, and individuals at increased risk for influenza-related complications. Treatment should ideally be initiated within 48 hours of symptom onset, although hospitalized patients and those with severe illness may still benefit when treatment starts later. Oseltamivir is the preferred antiviral for most patients, while zanamivir, peramivir, and baloxavir may be appropriate in selected situations based on patient characteristics and clinical judgement.¹²

Provide the most current treatment guidelines from Red Book to the healthcare provider or refer the case to the treating physician for appropriate clinical management of influenza.

III. EPIDEMIOLOGIC CASE INVESTIGATION

The public health authority should begin investigating reportable influenza cases in accordance with [NAC 441A](#). Nevada requires public health authorities to obtain sufficient information for laboratory-confirmed influenza-associated hospitalizations, laboratory-confirmed influenza associated deaths in persons younger than 18 years of age, and influenza viruses that are novel or determined by CDC or WHO to pose a national or global pandemic risk.¹³

A. Step 1: Review relevant information about the disease.

1. *Review scientific information in [Control of Communicable Diseases Manual](#), most recent edition.*

2. *Review the current [CDC influenza surveillance guidance](#), including the [Manual for the Surveillance of Vaccine-Preventable Diseases](#), and the applicable CDC/CSTE surveillance case definition when investigating reportable influenza-associated hospitalizations or other reportable influenza conditions.^{10,14}*

B. Step 2: Begin investigating the case.

1. *Contact Reporting Source and/or Reported Case*

Upon receiving an initial case report, review all lab test results, clinical details, hospitalization status, vaccination history, antiviral treatment, and epidemiologic factors. Please make three attempts to contact the case (text and phone calls) on separate days, at different times of the day (morning, afternoon, late afternoon). Document all attempts to contact a reporting source and/or reported case, preferably in the “Encounters” tab of EpiTrax. Please use case report forms (CRF) to gather accurate information about the case. Focus on the key data elements listed above. Filling out an electronic version of the CRF in EpiTrax (called a Confidential Morbidity Report (CMR) in EpiTrax) is preferred. If used, the completed PDF version should be attached to the CMR in EpiTrax. The CRF should be completed within 7 days of completing the investigation of the case.

C. Step 3: Identify potential sources of infection

The investigation should focus on exposures occurring during the 1 – 4 days before illness onset, consistent with the typical incubation period for seasonal influenza. During the interview, assess potential exposures including close contact with people experiencing respiratory illness, household, workplace, school, childcare, healthcare, or other congregate settings. Obtain recent travel history when clinically or epidemiologically indicated. living exposures, recent travel, and attendance at large gatherings when relevant. Document underlying medical conditions, influenza vaccination status for the current season, antiviral treatment, and any epidemiologic links to known outbreaks. If novel influenza A virus infection is suspected, obtain information regarding exposure to poultry, swine, wild birds, or other animals, as well as occupational exposures, in accordance with CDC and Nevada guidance.^{6,10}

D. Step 4: Initiate control measures for case and/or for contacts (see Section IV – Section VI below).

E. Step 5: Provide Education and Prevention messaging to the case and/or contacts (see Section IX below).

IV. CONTROL OF CASE

Influenza is primarily transmitted through respiratory droplets and infectious respiratory secretions. Prompt implementation of infection prevention and control measures reduces transmission in households, healthcare settings, schools, workplaces, and other congregate environments. Cases should be educated on measures to reduce transmission, including remaining home while ill, practicing respiratory hygiene and cough etiquette, performing frequent hand hygiene, and following healthcare provider recommendations regarding antiviral treatment when indicated.^{6,15}

1. *Management/Exclusions for Specific Groups or Settings*

	Symptomatic	Asymptomatic
Sensitive Occupation*	Exclude from work while symptomatic. Return to work when fever has resolved for at least 24 hours without the use of fever-reducing medications and symptoms are improving. Implement 5 days of added precautions (e.g., masking) upon return. Healthcare personnel should follow facility infection prevention policies and CDC recommendations regarding work restrictions (Exclude from work. May return after 7 days with a negative test, or 10 days without testing, assuming fever resolution and symptom improvement). ^{6,15,16}	No exclusion is generally required. Individuals should self-monitor for symptoms following a known exposure and follow employer or local public health guidance if symptoms develop. ⁶
Childcare/School Attendee	Stay home while symptomatic. Children and staff may return after they have been fever-free for at least 24 hours without fever-reducing medications	No exclusion is generally required. Monitor for development of symptoms. ⁶

	and are well enough to participate in routine activities. ⁶	
Case in a Medical Facility	Implement Standard precautions and droplet precautions for patients with suspected or confirmed influenza. Place the patient in a single room when feasible or cohort with patients infected with the same virus. Encourage source control (masking) during transport or when leaving the room. Continue precautions for 7 days after illness onset or until 24 hours after resolution of fever and improvement in respiratory symptoms, whichever is longer. ¹⁵	No additional transmission-based precautions are recommended in the absence of illness. Follow standard infection prevention practices and facility policies. ¹⁵
General Population	Stay at home while ill, avoid close contact with others, practice respiratory hygiene, cover coughs and sneezes, perform frequent hand hygiene, and seek medical evaluation if symptoms worsen or if at increased risk for influenza complications. ⁶	No exclusion is generally required. Individuals should remain up to date with annual influenza vaccination and monitor for symptoms following a known exposure. ⁶

* Sensitive occupation means employment that increases the potential for transmission of a communicable disease to other people, including but not limited to employment as a food handler, healthcare worker, childcare worker, or school employee, as defined in NAC 441A.¹³

2. *Exclusion Notifications*

Upon confirmation of influenza, notify the case of their diagnosis and provide education regarding measures to prevent transmission. Cases should be advised to remain home while symptomatic and until they have been fever-free for at least 24 hours without the use of fever-reducing medications and symptoms are improving. Individuals should be instructed to practice respiratory hygiene, cover cough and sneezes, perform frequent hand hygiene, clean frequently touched surfaces, and avoid close contact with people at increased risk for severe influenza complications. Healthcare providers should be advised to initiate antiviral treatment as recommended for hospitalized patients, patients with severe or progressive illness, and individuals at increased risk for influenza complications. Patients

should also be encouraged to receive annual seasonal influenza vaccination if not already vaccinated when clinically appropriate and after recovery from the acute illness.^{6,12,17}

V. CONTROL OF CONTACTS (IF APPLICABLE)

Contact is generally considered a person who has had close exposure to a symptomatic influenza case during the infectious period, particularly household members, intimate partners, healthcare personnel, childcare contacts, classmates, or other persons with prolonged close contact. Close contacts who develop symptoms compatible with influenza should be investigated in the same manner as a case. People at increased risk for influenza complications should be identified promptly, as they may benefit from early antiviral treatment or post-exposure antiviral chemoprophylaxis when clinically indicated.^{6,12,17}

1. *Management/Exclusions for Specific Groups or Settings*

	Symptomatic	Asymptomatic
Sensitive Occupation*	Exclude from work and evaluate for influenza. Return to work when fever has resolved for at least 24 hours without the use of fever-reducing medications and symptoms are improving. Healthcare personnel should follow facility-specific infection prevention policies and CDC work restriction guidance. ^{6,15}	Exclusion is generally not required. Monitor for development of symptoms following the exposure. Post-exposure antiviral chemoprophylaxis may be considered for certain high-risk individuals following clinical evaluation. ^{12,17}
Childcare/School Attendee	Exclude while symptomatic. Return when fever has resolved for at least 24 hours without fever-reducing medications and the individual is well enough to participate in routine activities. ⁶	Exclusion is generally not required. Monitor for symptoms and reinforce respiratory hygiene and hand hygiene practices. ⁶
Case in a Medical Facility	Evaluate promptly for influenza and implement standard and droplet precautions if influenza is suspected or confirmed. Follow facility infection prevention policies for patient placement, testing, and management. ¹⁵	Routine exclusion is not recommended. Monitor for signs and symptoms of influenza. Depending on the exposure and patient risk factors, antiviral chemoprophylaxis or additional infection prevention measures may be considered in

		consultation with infection prevention staff. ^{12,15}
General Population	Stay at home while symptomatic, avoid close contact with others, and seek medical evaluation if symptoms worsen or if at increased risk for influenza complications. ⁶	Exclusion is generally not required. Monitor for symptoms, practice respiratory hygiene and hand hygiene, and receive seasonal influenza vaccination if not up to date. ⁶

*Sensitive occupation means employment that increases the potential for transmission of a communicable disease to other persons, including but not limited to employment as a food handler, healthcare worker, childcare worker, or school employee, as defined in NAC 441A.¹³

2. *Exclusion Notifications*

Notify identified contacts of their potential exposure to influenza and advise them to monitor symptoms during the incubation period. Contacts should be educated regarding early signs and symptoms of influenza, respiratory hygiene and cough etiquette, frequent hand hygiene, and the importance of remaining home if illness develops. Individuals at increased risk for influenza complications should be advised to seek medical evaluation immediately if symptoms occur, as early antiviral treatment is most effective when initiated as soon as possible after illness onset. Post-exposure antiviral chemoprophylaxis may be considered for eligible contacts based on current clinical recommendations and individual risk factors.^{6,12,17}

VI. CONTROL OF CARRIERS (IF APPLICABLE)

A carrier state has not been documented for seasonal influenza and thus no carrier-specific control measures are needed.⁶

VII. MANAGEMENT OF SPECIAL SITUATIONS/OUTBREAK CONTROL

Coordinate with senior epidemiology staff to determine if an outbreak is occurring. If so, notify DPBH Environmental Health, local health authorities, or infection control, as appropriate.

Healthcare Facility Outbreaks

- Coordinate with the healthcare facility's infection prevention and control personnel and the appropriate local health authority.
- Confirm cases using available clinical, laboratory, and epidemiologic information.

- Recommend implementation of CDC infection prevention and control measures, including Standard and droplet precautions, appropriate patient placement, respiratory hygiene, hand hygiene, and environmental cleaning and disinfection.
- Coordinate with the Nevada state public health laboratory (NSPHL) for laboratory testing or additional characterization of influenza viruses when indicated.^{6,11,15}

Long-Term Care Facility Outbreaks

- Coordinate with facility leadership, infection prevention staff, and the appropriate local health authority.
- Recommend prompt identification and testing of residents or staff with suspected influenza.
- Recommend implementation of CDC infection prevention and control measures to reduce transmission within the facility.
- Recommend antiviral treatment for ill residents and antiviral chemoprophylaxis for eligible exposed residents or staff in accordance with current CDC and Red Book guidance.^{12,18}

School or Childcare Settings

- Coordinate with school or childcare administrator and the appropriate local health authority.
- Reinforce CDC recommendations for exclusion of ill students and staff and encourage prompt reporting of increased respiratory illness activity.
- Promote annual influenza vaccination, respiratory hygiene and cough etiquette, hand hygiene, and routine cleaning of frequently touched surfaces.⁶

Novel Influenza A Virus Infection

- Immediately notify senior epidemiology staff.
- Coordinate with the appropriate local health authority, NSPHL, and the Centers for Disease Control and Prevention (CDC) for laboratory confirmation, epidemiologic investigation, and implementation of appropriate public health control measures.
- Conduct case investigation and contact assessment in accordance with current CDC guidance and NAC requirements for novel influenza virus infections.^{6,13,14}
- Implement airborne, contact precautions, and eye protection (N95 respirator, face shield/goggles, gown gloves).

VIII. PREVENTION

The investigator should reference the most recent disease specific public educational materials from the CDC. The [Nevada OSE website](#) also provides current influenza surveillance information for Nevada. Prevention strategies include:

- Receive an annual seasonal influenza vaccine unless contraindicated.
- Stay home while ill until fever has resolved for at least 24 hours without the use of fever-reducing medications and symptoms are improving, with 5 days of added precautions.
- Practice respiratory hygiene and cough etiquette by covering coughs and sneezes.
- Wash hands frequently with soap and water or use an alcohol-based hand sanitizer when soap water is unavailable.

- Avoid close contact with people who are ill whenever possible.
- Clean and disinfect frequently touched surfaces.
- Healthcare personnel should follow recommended infection prevention and control practices, including standard droplet precautions when caring for patients with suspected or confirmed influenza.^{6,15}

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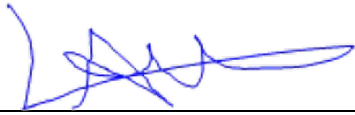
X. ACKNOWLEDGEMENTS

This document was developed based on the content and format of the disease investigation guidelines of several state and local health jurisdictions:

- Oregon Health Authority Investigative Guidelines
- Washington State Department of Health Reporting and Surveillance Guidelines
- Washoe County Health District Epidemiology and Communicable Disease Program Investigation of Communicable Disease Manual

The Nevada Office of State Epidemiology would like to acknowledge the work of these great partners.

XI. UPDATE LOG



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Chief Medical Officer

10/7/26

Chief Medical Officer Approval Date