JOINT CDA/NCID GUIDANCE ON NIPAH VIRUS INFECTION FOR HEALTHCARE PROFESSIONALS

DISEASE BACKGROUND AND OUTBREAK CHARACTERISTICS

1. The Nipah Virus (NiV) is an RNA virus that belongs to the genus Henipavirus of the *Paramyxovirus* family. Its natural reservoir hosts are fruit bats (*Pteropus* spp.) and possibly other species of bats. Pigs may serve as intermediate amplifying hosts for outbreaks in humans. Animal-to-human transmission may occur by: (i) direct contact with infected animals, such as bats and pigs, or their body fluids or excretions; and (ii) consumption of raw date palm sap or fruits contaminated by saliva or urine of infected bats. Limited human-to-human transmission of NiV among family, caregivers, community contacts, and healthcare providers of infected NiV patients through close contact with their secretions and excretions has been documented.

2. NiV was first identified in an outbreak of acute encephalitis among pig farmers in Malaysia in 1998-1999, which saw 265 cases of acute encephalitis (brain infection), accounting for 105 deaths. As part of this outbreak, Singapore saw 11 cases in March 1999, with one fatality. A high incidence of cases during the Malaysia-Singapore outbreak presented with encephalitis or had neurological symptoms, with no occurrence of human-to-human transmission.

3. In subsequent outbreaks in Bangladesh and India, a higher incidence of respiratory involvement were reported with limited human-to-human transmission. NiV poses a recurring risk across parts of South Asia, as its animal reservoir, fruit bats, is widely distributed across the region. Refer to **Annex A** for a list of past outbreaks, current as of date of update of this guidance.

4. NiV infection can cause severe neurological symptoms and/or encephalitis and pneumonia. It is a highly fatal illness, with a case fatality ratio (CFR) estimated generally between 40% and 75% in past outbreaks (**Annex A**), depending on local capabilities for epidemiological surveillance and clinical management (CFR ~ 40% for outbreaks in Malaysia and Singapore; CFR >70% for outbreaks in Bangladesh). At present, there are no specific licensed vaccines or therapeutics available for the prevention and treatment of NiV infection.

INCUBATION PERIOD

5. The incubation period of the NiV in humans is between **4 and 45 days**, with >90% of symptoms developing **between 4 and 14 days** after exposure[1,2]. Asymptomatic and mild infections have been reported, but only a minority of infected persons (<10%) were found to be truly asymptomatic. Duration of infectious period is unknown, but it likely begins during the incubation period and continues until the patient stops shedding the virus.

SIGNS AND SYMPTOMS (INCLUDING CASE DEFINITION)

6. As the signs and symptoms for NiV are non-specific, doctors should be alert to any traveller from NiV-affected regions with these presentations. In addition, doctors should always ask for travel history in patients presenting with signs and symptoms of encephalitis or respiratory distress, as they can be the result of many severe travel-related illnesses.

7. Doctors should suspect NiV infection in patients who present with:

[1] *Nipah virus fact sheet* (2026) *WHO*. Available at: https://www.who.int/news-room/fact-sheets/detail/nipah-virus.
[2] Verma A, Jain H, Sulaiman SA, Pokhrel P, Goyal A, Dave T. An impending public health threat: analysis of the recent Nipah virus outbreak and future recommendations - an editorial. Ann Med Surg (Lond). 2023 Dec 15;86(2):638-642.

- **Acute encephalitis picture characterised by initial symptoms of fever, headache, myalgia, vomiting and sore throat, followed by dizziness, drowsiness, altered consciousness, and seizures in severe cases, which may progress to coma within 24 to 48 hours[3]; OR**
- **Atypical pneumonia, and acute respiratory distress; OR**
- **Relapse encephalitis and late-onset encephalitis in those with initial non-encephalitic or asymptomatic diseases reported**

AND

- **Within the last 14 days prior to onset of symptoms,**
  - **Travel from NiV affected countries or regions with an ongoing NiV outbreak; OR**
  - **Exposure to bats or bat-contaminated food or pigs; OR**
  - **Exposure to a confirmed NiV case; OR**
  - **Consumed sap or other products from palm trees**

8. Patients with NiV infection generally present with fever, headache, dizziness and vomiting. The specific clinical presentations may vary depending on the NiV outbreak. Central nervous system (CNS) involvement occurs in the vast majority of symptomatic cases. A broad spectrum of neurological presentations has been reported, including aseptic meningitis, focal brainstem involvement, and diffuse encephalitis. Seizures and myoclonic jerks may occur in 20% of patients, while cerebellar signs are reportedly common. The disease is rapidly progressive for a majority of patients, with clinical deterioration leading to brainstem dysfunction and coma in 5-7 days. In survivors, relapsing and late-onset encephalitis (up to 11 years in the longest known case) are distinguishing features, occurring in up to 20% of cases. MRI brain in patients with CNS involvement typically demonstrates multiple small, discrete, hyper-intense lesions in the cerebral cortex, subcortical and deep white matter. Disseminated multifocal and confluent lesions in both cortex and white matter were also observed. CSF is abnormal in the majority of patients, showing lymphocytic pleocytosis and elevated protein.

9. Respiratory involvement occurs in up to 69% of cases, with the majority presenting with cough and dyspnoea. Chest X-ray changes of pneumonia and acute respiratory distress have been described.

10. Differential diagnoses: Clinicians would need to assess and evaluate for other relevant differential diagnoses based on epidemiological exposure/travel history such as bacterial or viral meningo-encephalitis, respiratory viral infections etc.

DIAGNOSIS

11. Diagnosis in acute infection is primarily by detection of NiV by PCR in blood samples. Whole blood should be submitted as the first-line specimen for NiV PCR. Additional samples obtained for PCR such as respiratory samples and, where clinically indicated, CSF or urine according to the predominant syndrome (encephalitic versus pneumonic) may be necessary. The following samples can be sent to the National Public Health Laboratory (NPHL) for diagnosis of acute NiV infection:

- Plain blood (3-5 mL in a red top tube), throat/nasal swabs, CSF (~2 mL) and/or urine (~2 mL), (depending on clinical presentation) can be sent for NiV PCR (together with Submission Form for VHF Testing and Nipah Virus PCR). Where in doubt, the laboratory should contact NPHL for further assistance. There should be proper instruction and training in packaging before transport of sample between laboratories.

[3] World Health Organization. (2018, May 30). Nipah virus. Who.int; World Health Organization: WHO. https://www.who.int/news-room/fact-sheets/detail/nipah-virus

CLINICAL MANAGEMENT

12. Clinical management is supportive, and the respective specialists (neurologists, respiratory physicians, infectious diseases physicians, etc.) can be consulted according to clinical needs.

13. Ribavirin has been used to treat NiV infections, and there was an open label trial in the 1998-1999 Malaysia outbreak that suggested reduced mortality compared with historical controls, but overall evidence is weak, subject to bias, and its clinical benefit is uncertain.

14. In addition, the antiviral treatment remdesivir has been effective in nonhuman primates when given as post-exposure prophylaxis, and may be complementary to immunotherapeutic treatments, although human data are lacking as to effectiveness, optimal dosing regimen and duration. Late remdesivir treatment (3 days post infection) has been reported to partially protect African green monkeys from lethal Nipah virus infection.

15. There are monoclonal antibody therapies that are currently under development and evaluation for treatment of NiV infections, and one monoclonal antibody from Australia, m102.4, has completed phase 1 clinical trials and has been used on a compassionate use basis.

16. Patients who are already admitted to hospitals should be managed in situ with the appropriate infection prevention and control precautions. Medically stable patients with suspected NiV identified by the primary care doctors will be sent to an appropriate hospital via a dedicated ambulance service.

NIPAH CANDIDATE VACCINES UNDER DEVELOPMENT

17. Several Nipah vaccine candidates, including ChAdOx1-based vectored vaccines, soluble G-glycoprotein subunit vaccines and mRNA platforms encoding Nipah F and G glycoproteins, have shown strong immunogenicity and protection in multiple animal models and have entered early-phase human trials. None of these candidates are currently licensed for routine clinical use, and their role in outbreak response remains investigational pending further safety, immunogenicity and efficacy data.

INFECTION PREVENTION AND CONTROL

18. Patients who are under investigation or confirmed to have NiV infection should ideally be isolated in an airborne infection isolation room (AIIR) and be placed on strict contact, droplet and airborne precautions – healthcare staff directly involved in patient care should don PPE[4] comprising gown, gloves, N95 mask and eye protection (face shield/eye goggles) when attending to these patients. Risks to healthcare staff can be mitigated with good infection prevention and control practices. Visitors should not be allowed.

19. All waste generated during the care of NiV suspect and confirmed patients should be handled as biohazardous waste, according to institutional policy.

20. Linen and laundry from suspects and confirmed cases should be managed as infectious linen and laundry. Institutions may consider the use of disposable linen.

[4] Personal protective equipment (PPE) posture will be reviewed from time to time as more data about the outbreak is available.

21. Rooms occupied by suspect or confirmed cases of NiV should be terminally cleaned with bleach-based disinfectants after discharge. Enhancement of terminal cleaning with either UV-C disinfection system or hydrogen peroxide vaporization is recommended.

MANAGEMENT OF CONTACTS

22. Caregivers to cases are at highest risk. CDA will conduct contact tracing for confirmed cases. Close contacts without appropriate PPE, will be placed under quarantine and monitored by MOH, where necessary. Healthcare staff who are close contacts but protected with adequate PPE, should be monitored by their respective hospital epidemiology units.

OTHER LABORATORY TESTING

23. For laboratory tests including non-microbiology tests which do not include virus propagation, a risk assessment should be done based on how the specimens are handled and how other laboratory tests are conducted. Specimens may be handled in the institution's BSL-2 laboratory with **additional precautions**. The laboratory should adhere to their standard procedures for handling samples potentially containing dangerous pathogens.

NOTIFICATION TO CDA

24. NiV infection is a notifiable disease under the Infectious Diseases Act (IDA). Any patient suspected or confirmed of being infected with NiV infection should be reported immediately to CDA via the Surveillance Duty Officer, followed by submission of the case details through the Communicable Diseases Live & Enhanced Surveillance (CDLENS) system.

ANNEX A

List of past Nipah outbreaks reported by WHO from 2016 to 2026 (updated as of 10 Feb 2026)

Year	Country	Area	Predominant mode of transmission	No. of confirmed cases	No. of fatalities
2026	Bangladesh	Naogaon district, Rajshahi	Raw date palm sap consumption	1	1 (100%)
	India	Parganas district, West Bengal	Investigations ongoing	2	1 (50%)
2025	India	Malappuram, Palakkad district, Kerala	Unknown	4	2 (50%)
	Bangladesh	Barisal, Dhaka, and Rajshahi	3 known to have raw date palm sap consumption; 1 Unknown	4	4 (100%)

2024	Bangladesh	Dhaka	Raw date palm sap consumption	2	2 (100%)
2023	India	Kozhikode district, Kerala State	First case unknown; Human-Human	6	2 (33%)
	Bangladesh	Dhaka, Rajshahi	Raw date palm sap consumption Human-Human	11 (including 1 probable as samples could not be collected before death)	8 (73%)
2021	India	Kozhikode, Kerala	Unknown	1	1(100%)
2018	India	Kozhikode and Malappuram, Kerala	Possible bat exposure Human-Human	19 (deceased index was suspected but could not be tested)	17 (89%)