WA diphtheria outbreak guidance for primary and acute care

The purpose of this guidance is to support clinicians in managing suspected and confirmed **cases** of diphtheria in the primary and acute care setting. This guidance is specific to the current diphtheria outbreak as of **29 July 2026** and will be reviewed and updated as new evidence and recommendations emerge.

Vaccination is the most effective protection against severe illness due to diphtheria. Antibiotics also play a significant role in treatment and reducing transmission. Diphtheria antitoxin (DAT) is reserved for use when toxin-mediated severe diphtheria is suspected and may be accessed after discussion with an infectious diseases physician and public health physician. DAT is only to be used in acute care setting under observation as it can cause severe hypersensitivity reactions.

Disease summary

Pathogen	Toxigenic *Corynebacterium diphtheriae* bacteria
Mode of transmission	Diphtheria spreads through close contact with an infected person: • breathing in droplets from coughing or sneezing • direct contact with saliva, respiratory secretions, or infected skin sores or exudate • contact with contaminated items such as bandages, towels or utensils.
Incubation period	Usually 2 to 5 days but can range from 1 to 10 days.
Infectious period	Diphtheria is communicable as long as bacterial shedding occurs. Asymptomatic carriage and transmission can occur prior to the onset of symptoms. Due to the variability in when carriage and infection may occur, it is difficult to define an exact period of infectiousness. However asymptomatic carriers are generally considered less infectious than symptomatic cases. **Cutaneous diphtheria** • Commences on the date the skin infection began (as best determined) or the date of skin swab collection if onset of infection is unknown; for long-standing sores or ulcers without a clear history of recent deterioration, consider the infectious period to commence 7 days before the swab collection date. • Continues until the patient has received at least 72 hours of appropriate antibiotics **OR** a negative throat swab **AND** the wound can be appropriately covered or is scabbed over. **Respiratory diphtheria** • Commences the earliest of 7 days prior to respiratory symptom onset or 7 days prior to positive throat swab (e.g. asymptomatic throat carriers). • Continues until demonstrated clearance by negative throat swabs, or completion of antibiotics if swabbing is not performed.

Clinical presentation

The infection presents as three main forms – classic (severe) respiratory, mild respiratory and cutaneous. Early assessment is important to determine whether the case is at risk of severe toxin-mediated classic respiratory disease (particularly in young or unvaccinated/under-vaccinated individuals, or more than 10 years since last vaccine), or whether it represents a milder respiratory or cutaneous infection:

Classic (severe) respiratory diphtheria

Classic (severe) respiratory diphtheria is characterised by pharyngitis, nasopharyngitis, tonsillitis or laryngitis **with** an adherent grey-white pseudomembrane involving the pharynx, tonsils, larynx and/or nose **or** severe respiratory disease (e.g. sepsis, stridor or airway obstruction, or bull neck due to cervical lymphadenopathy or swelling of the neck or throat).

It is a **toxin-mediated disease** leading to local tissue necrosis in the tonsils and throat, which forms the adherent pseudomembrane. The membrane should **not** be removed, as this may cause bleeding and precipitate airway obstruction or aspiration.

Mild respiratory diphtheria

Mild respiratory diphtheria is more common in vaccinated individuals, as the vaccine is protective against the toxin-mediated effects seen in classic (severe) disease. Onset may be gradual, and it typically presents with low-grade fever, sore throat and malaise, in the absence of a pseudomembrane or severe respiratory features.

Cutaneous diphtheria

Cutaneous diphtheria usually occurs on limbs and may present as primary ulcers with well demarcated edges or skin sores which can be clinically difficult to distinguish from impetigo. It may also occur in pre-existing skin lesions or wounds. Lesions may be covered by a greyish-white necrotic slough or membrane. Lesions are often slow to heal and are commonly coinfected with other bacterial pathogens. Cutaneous infection should be considered in chronic or non-healing ulcers, alongside other possible causes.

Testing of suspected cases

Diagnostic testing for *Corynebacterium diphtheriae* involves culture and PCR testing of throat and wound swabs to isolate the organism or to detect the toxin gene. The culture result confirms the presence of *C. diphtheriae* bacteria while the PCR detects the diphtheria toxin gene which is used as a surrogate marker for toxigenicity. All *C. diphtheriae* isolates are subsequently tested for the toxin gene.

During outbreaks and when there is a high suspicion of diphtheria, PCR testing can also be performed directly from swab samples (without the need for culture) to identify the toxin gene. However, because direct PCR testing can detect non-viable bacteria, it is not appropriate for clearance testing.

Collect high-quality throat swab[1] and/or skin lesion/wound swabs (including throat swab collection for confirmed cutaneous cases):

- semi-solid (Amies) transport medium swab with or without charcoal for *C. diphtheriae* culture
- paired dry throat and/or skin lesion swab for direct PCR toxin testing
- label both swabs appropriately and place in the same collection bag, specify swab collection sites and clearly mark **culture and PCR for diphtheria** on the request form.

[1] *a high-quality throat swab refers to a specimen collected from the posterior pharynx and both tonsils, targeting any visible membrane, exudate or lesion, while minimising contamination from other oral surfaces*

The dry throat swab that is collected is in addition to any other swabs for respiratory viral PCR testing. Ensure standard, contact and droplet precautions are used when performing all swabs.

Note: PathWest will only perform reflex *C. diphtheriae* culture when a direct PCR toxin test is positive; therefore, **both** culture and PCR must be specifically requested at time of collection. If severe respiratory diphtheria (DAT has been or will be administered), also indicate this on the pathology request form to ensure culture is performed regardless of direct toxin PCR results.

Amies Charcoal Swab
OR
Amies Gel Swab

Dry, plastic, or metal shaft
with synthetic fibre tip

Generally, asymptomatic or mild cutaneous infections with **non-toxigenic** *C. diphtheriae* do not require treatment or public health intervention. However, if respiratory symptoms or invasive infection is present, treatment should be guided by clinical judgement.

Confirmed cases of toxigenic cutaneous diphtheria should have throat swabs collected to assess for pharyngeal carriage.

Antibiotic treatment of cases

Antibiotics should be administered as soon as possible, **after** initial swabs have been collected for testing. Macrolides are the empiric treatment of choice due to reduced susceptibility to penicillin in the current outbreak strain.

The preferred first-line treatment for diphtheria is azithromycin, if not contraindicated. For **cutaneous** and **mild respiratory (pharyngeal) diphtheria**, the dosage is:

- azithromycin 500mg (10mg/kg up to 500mg in children) orally once daily for 7 days
- for children aged one month or older where azithromycin oral suspension is difficult to obtain, use erythromycin ethyl succinate 20 mg/kg up to 800 mg orally, 6-hourly for 14 days.

The standard multi-day regimen is strongly recommended; however, a single high-dose of azithromycin may be considered where there are significant **barriers to adherence** to oral therapy:

- azithromycin 2g (30mg/kg up to 2g in children) oral single dose.

For the single high-dose therapy, follow-up after 5 days is recommended to assess clinical response and obtain clearance swabs; if the patient is still symptomatic, discuss with an infectious disease physician or clinical microbiologist for further management advice.

If azithromycin is **contraindicated** (e.g. long QT), consider alternative agents, for example:

- amoxicillin 1g (30mg/kg up to 1g in children) orally, 8 hourly for 14 days.

Initial treatment of **classic (severe) respiratory diphtheria** is with combined intravenous azithromycin and benzylpenicillin therapy and consideration of DAT. See Appendix A for suspected respiratory diphtheria algorithm and Appendix B for cutaneous diphtheria algorithm.

Vaccination of cases

Patients with diphtheria should be vaccinated during recovery, as clinical infection may not induce adequate immunity. Patients who have completed a primary course of diphtheria-containing vaccines should receive a single age-appropriate booster dose if more than 12 months have elapsed since their last dose. Unvaccinated or incompletely vaccinated cases should commence a primary or catch-up course of diphtheria-containing vaccines as per the Australian Immunisation Handbook.

Diphtheria vaccination should be delayed by 4 weeks in patients who receive DAT.

Exclusions and restrictions

Respiratory diphtheria

All cases of classic (severe) respiratory diphtheria, or any hospitalised case of respiratory diphtheria, should undergo clearance testing consisting of two culture negative throat swabs collected at least 24 hours after completion of appropriate antibiotic therapy and at least 24 hours apart. This is to identify cases who may remain colonised with the bacteria after treatment.

Cases of mild respiratory diphtheria (as well as asymptomatic carriers with a positive throat swab) managed in the community should also undergo clearance testing ideally consisting of two culture negative throat swabs – where this is not feasible (e.g. due to a high case burden, limited laboratory capacity, or challenges with follow-up) discuss with the local public health unit who can rationalise clearance testing. This may include collecting a single throat swab at least 24 hours after completion of appropriate antibiotic therapy apart (or at least 5 days after receiving single high-dose azithromycin), with prioritisation of individuals who work in or attend settings with a high risk of exposure to vulnerable populations (e.g. childcare and hospitalised patients).

Individuals must be excluded from work, school, and childcare until culture negative results are obtained where clearance testing is undertaken. In all circumstances, cases should be advised to avoid contact beyond their household and with any vulnerable people, where possible, until completion of their antibiotic course.

Cutaneous diphtheria

People with cutaneous diphtheria should be excluded from work, school and childcare settings until their skin lesions or wounds can be covered with an occlusive waterproof dressing **AND** either at least 72 hours of antibiotics have been completed or a negative screening throat swab (to exclude pharyngeal colonisation) has been received. Cutaneous cases do not require clearance testing following completion of antibiotics unless the initial throat swab is positive.

Aboriginal environmental health referrals

Consider referral to Aboriginal Environmental Health services where environmental health risks have been identified within the home (with patient consent). A referral enables the environmental health service to engage with the patient and assess the home environment, including health hardware function and any other factors that may have contributed to the illness. Refer to Aboriginal environmental health program for further information and the referral template.

Include the following details on the referral form:

- diphtheria as a presenting health concern
- the date antibiotic treatment is due to be completed
- whether contact tracing has been completed.

Complications and follow-up

Complications of diphtheria can occur when diphtheria toxin is absorbed systemically. These are likely to be rare in a well-vaccinated population, but there is potential for cardiac, neurological and/or renal complications to occur, particularly among those with classic (severe) respiratory diphtheria.

Cardiac

The potential cardiac issues due to diphtheria are attributable to the attachment of toxin to cardiac myocytes and cells of the cardiac conduction system. Myocarditis can be life threatening, presenting with chest pain or tightness, shortness of breath, fatigue and palpitations; other cardiac manifestations include arrhythmias, conduction blocks, heart failure or sudden death. Myocarditis and conduction abnormalities typically occur 10 to 14 days after onset of symptoms.

Neurological

Diphtheritic polyneuropathy and cranial nerve palsies may occur, with most patients making a complete recovery. Where this occurs, onset is typically 10 to 36 days, and full recovery without residual sequelae may take 60 to 240 days.

Renal

Less commonly, acute renal failure and nephritis can occur. This may be due to acute tubular necrosis from direct injury to renal tubules by diphtheria toxin and damage to renal interstitial tissues.

Follow-up

The follow-up recommendations provided are intended as a guide only to support clinicians in planning subsequent appointments and do not replace the clinical judgement of the treating clinician.

All patients with confirmed cutaneous or respiratory diphtheria should be advised to seek medical attention if they develop symptoms consistent with late complications, including cardiac (e.g. chest pain, shortness of breath, palpitations) or neurological (e.g. numbness, tingling, loss of feeling or function, weakness, paralysis, difficulty swallowing or speaking) features.

Clinical follow-up is recommended for all cases of cutaneous and respiratory diphtheria at the following intervals:

2 weeks after symptom onset:

- check for symptoms of myocarditis; if symptoms of myocarditis are present, arrange ECG and further assessment/care as clinically indicated
- perform clearance swabs for those with respiratory diphtheria if not already completed
- provide age-appropriate diphtheria-containing vaccination during recovery if not received within the previous 12 months.

1 and 3 months after symptom onset:

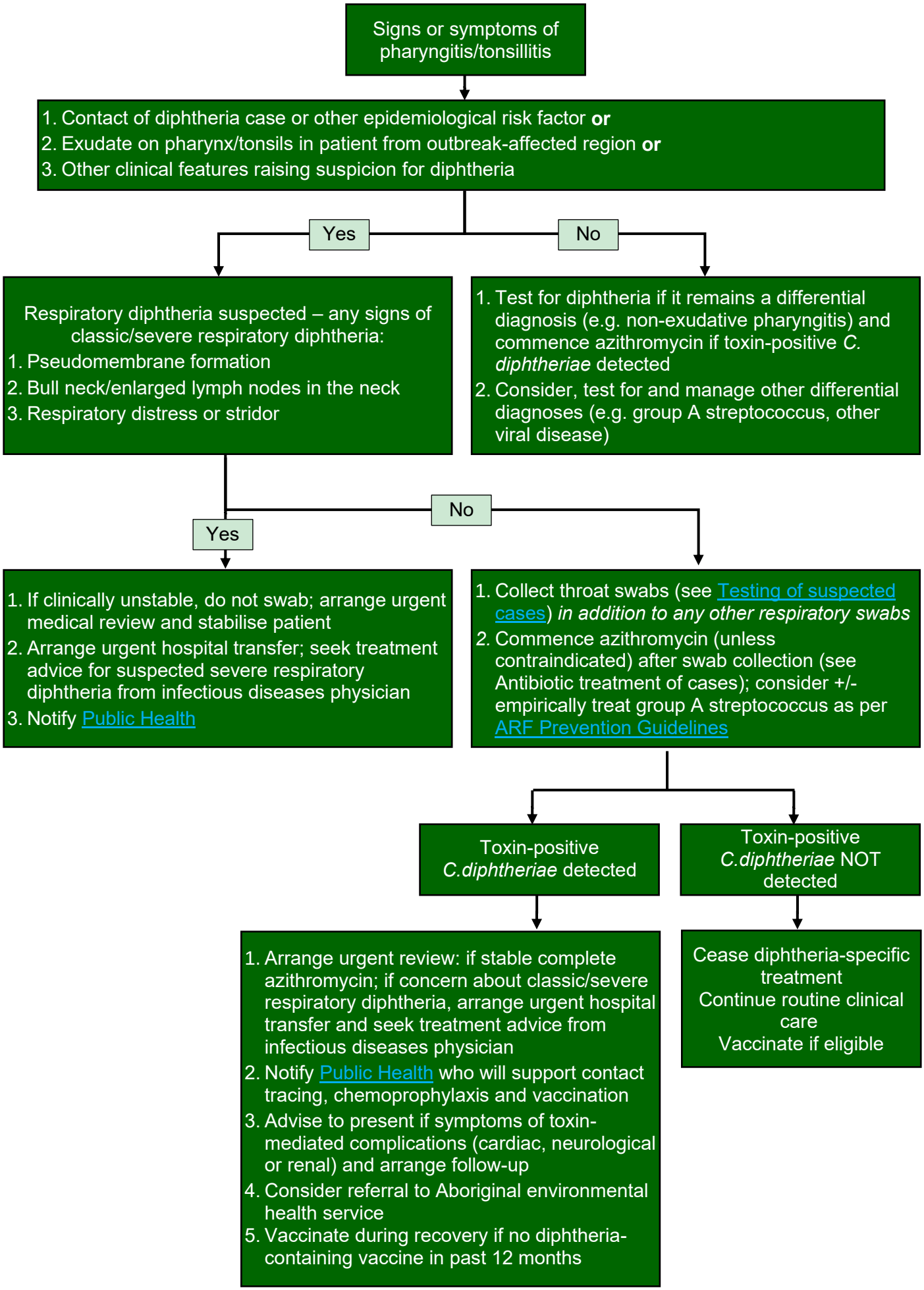
- assess for signs or symptoms of neuropathy
- consider performing UEC, particularly in those with risk factors for renal disease.

In the outbreak setting, clinical follow-up may need to be prioritised due to constrained workforce capacity. Cases of classic (severe) respiratory diphtheria, mild respiratory diphtheria in the unvaccinated, and mild respiratory diphtheria in those vaccinated more than 10 years ago, should be prioritised for clinical follow-up, followed by other cases of mild respiratory diphtheria and cutaneous diphtheria.

Contact management

Public Health will support contact tracing, chemoprophylaxis and vaccination, otherwise refer to WA diphtheria outbreak interim guidance for contact management guidance.

Appendix A: Suspected respiratory diphtheria algorithm



Appendix B: Suspected cutaneous diphtheria algorithm