Haemophilus influenzae type b invasive disease

Te Mana Ora Protocol

This protocol is based on the Ministry of Health Communicable Disease Control Manual[1]

- Protocol users should **document** their response to **action points,** marked throughout with this arrow.

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Associated documents

Te Whatu Ora Waitaha Māori health policy

Te Whatu Ora Waitaha tikanga policy

Te Whatu Ora Waitaha interpreter procedure

Te Whatu Ora Waitaha Informed Consent Policy

Te Mana Ora privacy/nohotapu policy

Case Report Form

Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\Haemophilus%20Influenzae%20type%20b\FormsStdLettersQuest\Hib_Nov2013.pdf

Hib individual contact forms

In Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\Haemophilus Influenzae type b

Information for the public is available on the Victorian Government's Better Health website (this is the reference provided on our Ministry of Health website):

https://www.betterhealth.vic.gov.au/health/healthyliving/haemophilus-influenzae-type-b-hib

The Illness[2]

Haemophilus influenzae is a gram-negative coccobacillus, which occurs in typeable and non-typeable (NTHi) forms. There are six antigenically distinct capsular types (a–f), of which type b is the most important.

Prior to immunisation, the most common presentations of Hib invasive disease in New Zealand were meningitis and epiglottitis. Meningitis tends to occur in younger children aged between 3 months and 3 years, while epiglottitis usually occurs in children aged between 2 and 4 years. In the absence of vaccination these presentations may still occur. There have always been a small number of cases of H. influenzae invasive disease in adults, and these continue to occur.

Non-typeable H. influenzae (NTHi) organisms usually cause non-invasive mucosal infections, such as otitis media, sinusitis and bronchitis, but can occasionally cause bloodstream infection, especially in neonates. They are frequently present (60% – 90%) in the normal upper respiratory tract flora. Immunisation against Hib does not protect against infections due to other H. influenzae types or NTHi strains.

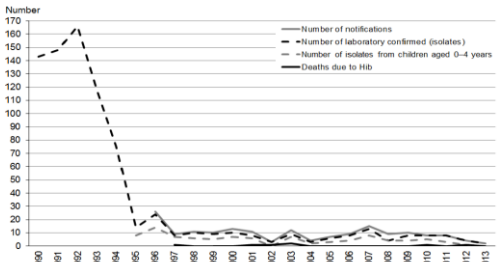
Young infants (aged under 2 years) do not produce an antibody response following Hib invasive disease, so a course of Hib vaccine is recommended when they have recovered. H. influenzae type b and NTHi strains also cause diseases (including pneumonia and septicaemia) in the elderly.

Epidemiology in New Zealand

Historically, Haemophilus influenzae type b (Hib) was an important cause of serious illness in children under 5 years of age in New Zealand. However, following the addition of Hib vaccine to the national immunisation schedule in 1994, the age-specific rate of the disease reduced from 36.4 cases per 100,000 in 1993 to 1.7 cases per 100,000 by 1999 and has remained at low levels since then (Figure 1).

In 2015 there were three cases notified; all were aged less than 5 years and none were vaccinated[1].

Figure 1: Number of culture-positive cases of Haemophilus influenzae type b invasive disease in NZ 1990-2013



Te Mana Ora cases: last five years

In the five years to August 2019, no cases were recorded for the Canterbury, South Canterbury or West Coast DHBs.

Clinical description

Invasive disease due to Hib may manifest as bacteraemia, meningitis, epiglottitis, cellulitis, septic arthritis, pneumonia (not a notifiable condition unless it is associated with bacteraemia/septicaemia), empyema, pericarditis or osteomyelitis.

Incubation

Incubation period is unknown, probably from 2-4 days.

Transmission

Transmission is by inhalation of respiratory tract droplets or by direct contact with respiratory tract secretions.

Communicability

Communicability may be prolonged. Non-communicable within 24–48 hours of starting effective antimicrobial therapy.

Prevention

Immunisation at 6 wks, 3, 5 and 15 months. Antibiotic prophylaxis for contacts of sporadic cases.

Notification

Attending medical practitioners and laboratories must immediately notify the local medical officer of health of suspected cases. Notification should not await confirmation. If clusters of cases occur MOoH should notify the Ministry of Health.

Case classification

Under investigation - A case which has been notified but information is not yet available to classify it as probable or confirmed.

Probable

- A clinically compatible illness with detection of a positive antigen test in CSF

OR

- A confident diagnosis of epiglottitis by direct vision, laryngoscope or X-ray.

Confirmed - A clinically compatible illness that is laboratory confirmed.

Not a case - A case that has been investigated, and subsequently has been shown not to meet the case definition.

Laboratory testing

Isolation of H. influenzae type b, or detection of H. influenzae type b nucleic acid, from a normally sterile site. Sputum from a case with Haemophilus influenza pneumonia is not sent for typing as it is not from a normally sterile site. Furthermore, Haemophilus influenza type b pneumonia is not notifiable as it is not regarded as being invasive – see Clinical description above.

Cultural and social context

Cultural, social, work and home environments affect any person's risk of contracting a communicable disease, the likely impact of that disease on them, and their likelihood of passing the infection on others. Keep these factors in mind at every point of your investigation and follow-up.

- Request an **interpreter** if needed
- **Consider** the potential impact of cultural, social, work or home factors on a person or family's ability or willingness to provide information and/or follow public health advice
- **Tailor your advice** to the situation
- **Seek advice yourself** if unsure. Talk to:
    - Te Mana Ora Māori Relationships Manager or Pacific Relationships Manager or Communicable Diseases Manager for advice on community and primary care support people or agencies
    - Ngā Ratonga Hauora Māori for Maori patients at Christchurch Hospital or Christchurch Women's hospital
- If appropriate, and with the case and/or contact's permission, seek the **assistance** of family or other community members, community leaders, and/or support agencies if required

Management of case

Investigation

- **Action immediately.**
- Ascertain the **clinical history** and whether the specimen tested was taken from a **"normally sterile site"** (ie not a sputum sample). For hospitalised patients review the Cortex notes; for community lab results the HPO or MOoH should contact the general practice if possible.
- **Discuss with the MOoH** to determine if we can wait for the typing results or we should contact case/caregiver and arrange to see them as soon as possible.
- **Case Report Form completed** from case notes plus interview with case/caregiver or faxed to notifying doctor for completion.
    - Obtain a **history of vaccination, possible contacts and travel.**
    - Ascertain if suspected or proven cases have occurred in the **same household or child care facility** in the previous 60 days**.**
- Ensure isolates from normally sterile sites are **serotyped.**
- **Inform MOoH**

Note; if the notification is associated with **childbirth** and the serotype has not been identified at the time as type b, prophylaxis may not be required as Haemophilus influenzae untypeable occasionally causes disease in this situation. In this situation, discuss the need for prophylaxis with the obstetrician and neonatal paediatrician, follow-up the laboratory result, and be prepared to give prophylaxis if isolate turns out to be type b.

On the West Coast, Public Health Nurses follow up these notifications.

Restriction

- **Droplet precautions** until 24 hours after the start of third-generation cephalosporin therapy (cefotaxime, ceftriaxone, ceftazidime) or until a 4-day course of rifampicin is completed.
- **Exclude** case from any early childhood service or school and from close contact with previously unexposed people until 24 hours after commencing treatment**.**

Treatment

All cases should be under the care of a physician or paediatrician.

Cases treated with amoxycillin/ clavulanate or amoxycillin alone should also receive oral rifampicin 20 mg/kg (maximum 600 mg) once daily for 4 days to **eradicate carriage** of the organism before discharge from hospital. Cases treated with a third-generation cephalosporin (cefotaxime, ceftriaxone, ceftazidime) do not need rifampicin.

Immunisation

Cases under 2 years of age should complete a course of Hib immunisation regardless of any previous Hib immunisation. The number of doses required will depend on the age at which the first dose is given after the illness. Re-immunisation should start 1 month after the onset of the disease.

Counselling

- **Advise** the case's parents or caregivers of the nature of the infection and its mode of transmission**.**
- **Educate the parents** regarding the **risk of secondary cases** in contacts less than four years old and the need for prompt evaluation and treatment if symptoms develop

Information for the public is available on the Victorian Government's Better Health website (this is the reference provided on our Ministry of Health website):

https://www.betterhealth.vic.gov.au/health/healthyliving/haemophilus-influenzae-type-b-hib

Management of contacts

Definition

Members of the household, and staff and children at early childhood services exposed within 7 days before case developed symptoms and until 24 hours after starting effective antibiotics.

Duration of exposure of contacts to the case should be assessed on a case-by-case basis, but has been defined as spending 4 or more hours with the index case for at least 5 of the 7 days preceding the day of hospital admission of the index case[1].

Prophylaxis is indicated for contacts specified under Prophylaxis below

Investigation

- **Follow up within 24 hours** to identify contacts for restriction, immunisations and antibiotic prophylaxis where appropriate

Routine throat or nasopharyngeal culture of contacts is not recommended.

Restriction

- When chemoprophylaxis is required at an early childhood service (see above), **children and staff should be excluded from the service until prophylaxis has been started**. Children entering the group while prophylaxis is being given should also receive it. Contacts on rifampicin may attend a child care facility 24 hours after the start of treatment.

Prophylaxis

- To eradicate the carrier state and protect susceptible children, **antimicrobial prophylaxis should be given to the following contacts as soon as** possible and ideally within 7 days of the index case developing the disease, irrespective of their own immunisation status. Prophylaxis started after 7 days may still be of benefit and is recommended up to one month after the last exposure.
- If a preschool centre is involved**, contact supervisor** and arrange for rifampicin distribution as soon as possible.

The relevant contacts are:

- all members of the case's household (including adults) where there is **at least one contact under the age of 4 years who is either unimmunised or partially immunised**
- all members of a household where there **is a child aged under 12 months**, even if the child has had three doses (primary series) of the Hib vaccine
- all members of the case's household where there is a person with **immune suppression**
- all staff and children at **an early childhood service where two or more cases of Hib have occurred** within 60 days.

Antimicrobial prophylaxis is **not recommended** for:

- occupants of households where there are no children aged under 4 years other than the index case
- occupants of households where all contacts aged under 4 years have completed their immunisation series, including the second-year-of life dose, except if there is a child with immune suppression.
- contacts in early childhood learning services where there is only one index case and all contacts are over two years of age.

Discuss with MOoH if other children under four years of age have been exposed.

Antibiotics

Preferred antibiotic

Use oral rifampicin 20 mg/kg (maximum 600 mg) daily for 4 days[1].

Rifampicin is contraindicated in pregnant women but not in breast feeding (refer to Contraindications below).

Rifampicin may be administered by Te Mana Ora staff under a standing order (see below)

Indications

See Prophylaxis (above)

Contraindications

- Pregnancy
- Previous severe reaction to rifampicin
- Premature infants
- Those who have jaundice
- Those on ritonavir/ saquinavir (combination antiretroviral therapy)

Rifampicin is not contraindicated for breastfeeding mothers, as only small amounts are secreted into breast milk and because of the short duration of the course.

Pregnant women who are a contact should be offered intramuscular ceftriaxone (1 gm) daily for 4 days[1].

Consultation with an infectious diseases physician is recommended for other contacts in whom rifampicin is contraindicated.

Preparations

Capsules: 300 mg. Syrup (suspension): 100mg/5ml in 60ml bottles

Dose

CONTACT'S AGE	RIFAMPICIN DOSE Taken daily for four days	Total amount dispensed = dose x 4
Birth to less than 1 month	see below	
1 month to less than 6 months	see below	
6 months to less than 3 yrs	10 ml	40 ml
3 yrs to less than 4 yrs	15 ml	60 ml
4 yrs to less than 7 yrs	20 ml	80 ml
7 yrs to less than 11 yrs	30ml or 2x300 mg caps	120ml or 8x300 mg caps
11 yrs and over	2 x 300mg caps	8 x 300mg caps

If contacts are considerably **underweight** or **over weight**, the following is recommended:

Adults: 600 mg daily for 4 days (usual adult dose regardless of weight)

Children: 1 ml of syrup/kg (to a maximum of 30ml, ie: 600mg) daily for 4 days. Dose (mls) = weight (kg). Total volume dispensed (mls) is the dose x 4.

Infants under 1 month: 0.5ml of syrup/kg per dose daily for 4 days.

Rifampicin must be taken **1 hours before or 2 hours after meals** to ensure absorption.

Side effects

- **Explain** the side effects of rifampicin**:**
  - **Orange discoloration** of soft contact lenses (not to be worn while taking rifampicin), tears and urine.
  - May decrease the effectiveness of **oral contraceptives.** Women should be advised to **use alternative barrier contraception** for two weeks after rifampicin course is finished.

There is a Rifampicin **information sheet**:
Y:\CFS\Quality\ApprovedDocuments\ProtectionTeam\FactSheets\Rifampicin_Hib_Inform_Vacc Sheet.pdf

Accessing antibiotic supplies

Christchurch:

Rifampicin (and protocols including Hib) are kept in the 'meningitis' case. Case and supplies are kept in the storeroom room. Ward 22 and the After Hours Surgery (Bealey Ave) may also have a small amount. Patient/caregiver also given a rifampicin information handout and letter for GP.

If supplies of Rifampicin get low further supplies are purchased from Christchurch Hospital Pharmacy.

Timaru:

The HPO contacts the pharmacy, requests access to the rifampicin and calls to collect anticipated requirements (after hours, phone Timaru Hospital and ask for the on-call pharmacist). The HPO dispenses rifampicin after discussing each contact with the MOoH. Unused rifampicin is returned to the pharmacy, along with the completed Meningitis Contacts sheet. The pharmacy will provide individual scripts for an MOoH signature as soon as practicable.

Ashburton:

The hospital pharmacy hold the C&PH supply. Contacts can collect rifampicin, the antibiotic information pages the Hib pamphlet, and the letter to the GP from the hospital pharmacy, after a fax from the HPO.

Greymouth:

Rifampicin is obtained from the Grey Hospital Pharmacy. The HPO contacts the pharmacy, requests access to rifampicin, faxes a request (Fax 768 2699) and then calls to collect anticipated requirements. After hours, phone Grey Hospital and ask for the on-call pharmacist or pharmacy technician, fax the request and allow sufficient time for pharmacy on call staff to attend before collecting the medication. The HPO dispenses rifampicin after

discussing each contact with the MOoH. Unused rifampicin is returned to the pharmacy, along with the completed Meningitis Contacts sheet. The pharmacy has provided preformatted individual scripts for completion and an MOoH signature as soon as practicable. The scripts are kept in the on-call kit in the on-call vehicle.

Standing orders

Rifampicin may be given under Standing Orders found here:

https://prism.cdhb.health.nz/site/policies/SitePages/Policy%2520View.aspx?ppid=2405755

Standing Orders allow prompt administration of prescription medication while ensuring that the Nurse or HPO has legal cover under the Standing Order Regulations 2002.

Nurses and HPOs who have undertaken **training and an annual assessment** on the Standing Orders, who have achieved the **competency** required, and who are on duty and working on behalf of Te Mana Ora may administer Rifampicin under the Standing Orders.

Rifampicin may only be administered as specified in this procedure.

If a Nurse or HPO acts entirely within this Standing Order and procedure, then any consequence of his/her action is the responsibility of the MOoH and Te Mana Ora.

The Nurse or HPO is accountable for his/her decision-making, for application of the Standing Order and procedure, and for clear documentation of actions taken.

- The Nurse or HPO **completes the Standing Order** which requires his/her **signature** and **countersigning** by an MoH within 72 hours.
- **Keep the MOoH informed**. Discuss individual contacts with him/her if at all concerned.
- The following contacts may require a different medication and **must be discussed with MOoH**:
  - Those with **contraindications.**
  - Those who are **pregnant.**
  - Those **taking other medications.**
- All contacts must be given **verbal and written information** about the medication, its side effects, contraindications, and interactions with other medicines.
- A **fax** should be sent to the contact's GP to advise them of the medication prescribed. This fax form is on the reverse of the Individual Contact Form.
- If medications are discussed and/or administered in the context of a hospital visit by public health staff, this should be **recorded in the case's hospital notes** (discuss with ward staff).
- Supply of Ciprofloxacin or Rifampicin under Standing Orders must be **documented** by the Nurse or HPO on the Contacts Table (refer to location in Associated Documents section). Documentation **must include:**
  - Date
  - Name and date of birth of contact
  - Name of medicine
  - Dosage given
  - Reference to Standing Order
  - Signature of contact or caregiver
  - Issuer's Name, designation and signature

Immunisation

All children aged less than 5 years should have their Hib immunisation status checked and if incomplete should update with a Hib vaccine.

Counselling

- Inform contacts who do not receive prophylaxis about the **signs and symptoms** of invasive Hib disease, the infrequency of secondary cases, and advise them to access **prompt medical attention** should symptoms occur.
- All children should have their **immunisation status** checked and, if it is incomplete, should complete their immunisation with an appropriate vaccine containing Hib.

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Other control measures

Outbreak

In a cluster or outbreak scenario a larger group of individuals may need to be offered prophylaxis, ie. if two or more cases of Hib have occurred in a child care facility within a sixty-day period, all staff and children should be offered prophylaxis- see Prophylaxis above.

Disinfection

Discuss with the MOoH the possibility of involving an Infection Control Officer if disinfection of articles is required.

Health education

- Consider a **media release and direct communication** with local parents, early childhood services, schools and health professionals to ensure children receive a full course of immunisation with Hib-vaccine and to encourage prompt reporting of symptoms
- In communications with doctors, include recommendations regarding **diagnosis, treatment and infection control**
- Encourage parents and early childhood services to ensure children receive a full course of on time **immunisation** with a Hib vaccine
- Encourage early childhood services to keep up-to-date **immunisation records** of children [see the Health (Immunisation) Regulations 1995

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https://www.betterhealth.vic.gov.au/health/healthyliving/haemophilus-influenzae-type-b-hib

Reporting

- Enter case details on **EpiSurv.**
- **Document** your response to each **action point** (marked with this arrow) in this protocol
- If a **cluster of cases** occurs, inform the MoH and ESR and forward an outbreak report to ESR**.**

References and further information

1. Ministry of Health, *Communicable Disease Control Manual*. 2019, Ministry of Health: Wellington.
2. Ministry of Health, *Immunisation Handbook 2017*. 2nd ed. 2018, Wellington: Ministry of Health.
3. Centers for Disease Control and Prevention. *Haemophilus influenzae Disease (including Hib)*. 2018; Available from: https://www.cdc.gov/hi-disease/index.html.
4. New South Wales Government. *Haemophilus influenzae type b (Hib) control guideline*. 2014; Available from: https://www.health.nsw.gov.au/Infectious/controlguideline/Pages/haemflu.aspx.
5. Wilson, N., et al., *The beneficial impact of Hib vaccine on disease rates in New Zealand children.* N Z Med J, 2002. **115**(1159): p. U122.
6. Public Health England. *Haemophilus influenzae: guidance, data and analysis*. 2013; Available from: https://www.gov.uk/government/collections/haemophilus-influenzae-guidance-data-and-analysis.

Document Control

Protocol review task	Responsibility	Date completed + version no.
Advise team, quality, doc control & web coordinators of review (and planned timeframes).	Public Health Specialist (PHS)	18/07/2019
Open the protocol in EDMS Owner's view, ensure it is based on the current template, remove any blue font formatting (indicating new content for the previous version), and turn on "track changes".	PHS	18/07/2019
Review Ministry of Health (MoH) advice, literature, other protocols, and write draft update, marking new content in blue font.	PHS	24/09/2019
Update Fact Sheet as necessary (or source the URL link from MoH website).	PHS	24/09/2019
Start an EDMS review workflow of draft version to pre-set document members – MOsH, CD, Team Leader, and HPO for feedback. (Check members are correct before starting workflow.)	PHS	24/09/2019
Incorporate feedback and update draft(s) further as required.	PHS	24/09/2019
Start an EDMS approval/ publishing workflow of final version to Clinical Director (Authoriser).	Com Dis Medical Officer of Health (MOoH)	24/09/2019
Clinical Director approval recorded in EDMS.	Clinical Director (CD)	V1, 24/09/2019
Document Controller receives EDMS notification of CD approval – Complete **electronic** document control tasks, incl.: header; footer; EMDS document properties/metadata. Check Te Mana Ora policies and procedures site page links are valid, and add new links as required. Create .pdfs (for external links), and save to CFS folders: • Protocols – Y:\CFS\Quality\Archive\Protection\IntranetPROTOCOLS • Fact Sheets –Y:\CFS\Quality\Archive\Protection\FactSheets • Once a new or reviewed document has been approved, upload pdf version to: • Protocols – Surveillance (PHU server) website and Microsoft Teams on-call documentation group. • Fact Sheets – CPH website or links are checked to MoH website	Quality Coordinator (QC)	V4, 09/07/2024
Update **paper** copies as required (on-call folder/ vehicle).	Health Protection Officer (HPO)	V4, 09/07/2024
Advise operational/ regional staff of update, summarising any substantial changes (text highlighted in blue font in document).	QC, HPO, or Team Leader	V4, 09/07/2024
Once process finalised, **move** any original draft documents saved in CFS locations to: Y:\CFS\Quality\Archive\Protection\ComDisProtocolsArchive	QC	V4, 09/07/2024
Minor update notes: V1 full review	PHS	V1, 24/09/2019
Minor update notes: V2 updated to new logo/ format	DC	V2, 15/06/2022
Minor update notes: V3 added Pacific Relationships Manager into Cultural and Context section	QC	V3, 16/02/2023
Minor update notes: V4 clarified initial step to ascertain whether a lab-notified result represents a case of invasive disease	PHS	V4, 09/07/2024