

Rheumatic Fever

(Based on the Ministry of Health Communicable Disease Control Manual 2012 – 14 Dec 2014 update; updated October 2018 to incorporate Amoxicillin Standing Order Guidance)

Associated Documents	
	<p>Fact Sheet https://www.health.govt.nz/our-work/diseases-and-conditions/communicable-disease-control-manual/rheumatic-fever</p> <p>Contact Table ContactTracingSheet181008">Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\RheumaticFever\FormsStdLettersQuest\Forms>ContactTracingSheet181008</p> <p>Individual Contact Form Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\RheumaticFever\FormsStdLettersQuest\Forms\RFIndividualContactForm160916.docx</p> <p>GP Letter – Antibiotic Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\RheumaticFever\FormsStdLettersQuest\Standardletters\GPFaxGASAntibioticTreatmentReqd181008</p> <p>Amoxicillin Prophylaxis Standing Order – for Rheumatic Fever Disease Contacts</p> <p>Amoxicillin Information Sheet</p> <p>Amoxicillin suspension Medsafe Data Sheet: https://www.medsafe.govt.nz/profs/Datasheet/a/Alphamoxsusp.pdf</p> <p>Amoxicillin capsules Medsafe Data Sheet: https://www.medsafe.govt.nz/profs/Datasheet/a/alphamoxcap.pdf</p> <p>Te Whatu Ora Waitaha Canterbury Informed Consent Policy</p>
The Illness	
	<p>Group A Streptococcal (GAS) bacteria <i>Streptococcus pyogenes</i> cause a variety of diseases the commonest being tonsillitis/pharyngitis and skin infections such as impetigo. GAS can also cause mastoiditis, cellulitis, septicaemia and scarlet fever as well as other diseases. Possible complications of pharyngitis include glomerulonephritis and Acute Rheumatic Fever (ARF).</p> <p>Sore throats Most sore throats are viral in origin, however 15–30% of sore throats in children and 10% in adults are estimated to be due to GAS. In approximately 0.3-3% of people, GAS pharyngitis may lead to ARF. Group A streptococci spread in crowded situations, such as army barracks and schools, by droplet spread or from saliva or nasal secretions. Pharyngitis caused by GAS may present with or without fever, exudate and tender anterior cervical lymph nodes. Some patients present with non-specific symptoms. ^{1, page 16}</p> <p>GAS pharyngitis is highly infectious in households and asymptomatic carriers can act as infection reservoirs, if it is not treated with appropriate antibiotics. Not all throat infections will be symptomatic. If the GAS throat infection is not treated, ARF can develop in approximately 1-3% of susceptible individuals. The ARF disease process is thought to have an autoimmune basis, which is not well understood. Currently it is not clear who is at risk of developing this complication. There is no definite evidence that GAS skin infections can cause ARF. GAS throat infections can proceed to rheumatic fever in 2-3 weeks on average, if not treated with antibiotics.</p>

Epidemiology of ARF in New Zealand:

The incidence of rheumatic fever in New Zealand is much higher than in comparable countries and regions such as North America and the United Kingdom. Within New Zealand, the incidence varies greatly by geographic region and ethnicity. Māori and Pacific peoples, in particular, are disproportionately affected, for both acute rheumatic fever (ARF) and chronic rheumatic heart disease (RHD). Most cases of ARF are in children aged 5–14 years, although about one-third of cases occur in older teens and young adults. Causative factors include economic deprivation, household crowding, poor health literacy and lack of access to health care.

Ministry of Health Comment

ARF (including recurrence) is a notifiable disease; however rheumatic heart disease, in the absence of signs and symptoms of ARF, is not. The purpose of ARF notification is to facilitate public health investigation and community education and to inform prevention strategies for addressing causative factors for cases and high-risk populations. Causative factors (mentioned above in Epidemiology of ARF in New Zealand) prevent rapid investigation and effective treatment of group A Streptococcus (GAS) pharyngitis and access to secondary prevention of recurrences.

When rheumatic fever first became notifiable in 1986, guidance was given to medical professionals that presumed rheumatic heart disease in patients under the age of 20 years should be notified to the local medical officer of health (Department of Health circular letter to Medical Practitioners HP 1/87, January 1987). Notification of rheumatic heart disease under the age of 20 years is no longer required as the diagnosing medical professional is responsible for ensuring cases of rheumatic heart disease that require secondary prophylaxis receive active clinical follow-up. Local registers are useful to facilitate active follow-up and help prevent cases from being lost to follow-up. ARF registers in New Zealand have been shown to be effective at reducing admissions for ARF recurrences (National Heart Foundation 2006).

CASE DEFINITION

Clinical description

ARF is an autoimmune consequence of a throat infection caused by the bacterium GAS, that is, *Streptococcus pyogenes*. It causes an acute generalised inflammatory response and an illness that affects only certain parts of the body, mainly the heart, joints, brain and skin. All suspected cases of ARF should be referred to hospital for specialist assessment, investigation, education and treatment.

ARF is a clinical diagnosis (see '**Case classification**'). Currently, there is no single laboratory test for ARF. Laboratory tests for evidence of preceding GAS infection are described below (see **Laboratory Testing**).

The Jones criteria for diagnosing ARF divide the diagnostic features into major and minor manifestations based on their prevalence and specificity. The original Jones criteria were modified in 1992² and reconfirmed by the World Health Organization (WHO) in 2004.³ (See **Notification Procedure** below for Jones criteria and Case Classification).

Transmission: ARF is not infectious but the precursor condition GAS pharyngitis is infectious within households and other situations (see also **Sore Throats** above).

Infectivity: Untreated, uncomplicated throat infections are infectious for 10-21 days. With adequate penicillin treatment GAS throat infections generally are not infectious after 24 hours.

Incubation period: From exposure to GAS to the development of a sore throat is 1 - 5 days. On average ARF develops in 19 days but may range from 1-5 weeks after infection.

Prevention: Strategies that address the multiple determinants of rheumatic fever are more likely to have long-term success, including:

- primary prevention of GAS infections, for example, improving housing conditions
- early treatment of GAS infections, for example, by improving health service access and early diagnosis and treatment (community- or school-based interventions)
- ensuring good follow-up for antibiotic prophylaxis (secondary prevention).

Notification Procedure

- Acute Rheumatic Fever (including recurrence) is a notifiable disease; however rheumatic heart disease, in the absence of signs and symptoms of ARF, is not (see MoH Comment page 1 for further details).
- It is expected that the attending medical practitioner will notify the local Medical Officer of Health of suspected initial or recurrent cases of ARF within seven days.
- Notification should be on suspicion and not await a confirmed diagnosis (see also 'Reporting').
- If cases of ARF are identified through other processes, such as audits, there is no legal requirement for the audit team to notify these cases to the local Medical Officer of Health or for these cases to be recorded on EpiSurv (although cases identified through audit activities should still be entered into the local register if prophylaxis or follow-up is indicated). However, if a case identified via audit is notified to a Medical Officer of Health by the attending medical practitioner, this case should be recorded on EpiSurv.

Case classification

The diagnosis of ARF relies on health professionals being aware of the diagnostic features of the condition, particularly when presentation is delayed or atypical. Diagnostic certainty may vary according to location and ethnicity. Diagnosis is largely based on the Jones criteria, which are divided into major and minor manifestations based on their prevalence and specificity (see Table 1).

ARF episodes can be classified as **initial attacks** (no known past history of ARF) or **recurrent attacks** (an episode in a person with a known past history of ARF that fulfils the criteria for a **suspect, probable** or **confirmed** case or previously diagnosed rheumatic heart disease) (see below following Table 2).

The case classification for both initial and recurrent attacks is described in Table 2 below. The table also describes how the classification aligns with the categories used in the New Zealand Guidelines for Rheumatic Fever: 1. Diagnosis, management and secondary prevention (National Heart Foundation 2006).

Referral to a rheumatic fever register may still be recommended for some people who do not meet the case definitions (see 'Reporting').

Table 1: Jones criteria for acute rheumatic fever

Manifestation	Criteria
Major manifestations ² modified from Jones 1992	Carditis (including evidence of subclinical rheumatic valve disease on echocardiogram) ¹ Polyarthriti ² (or aseptic monoarthritis; refer to National Heart Foundation 2006 for further information) Chorea (can be stand-alone for definite/confirmed initial or recurrent ARF diagnosis) Erythema marginatum Subcutaneous nodules
Minor manifestations	Fever Raised ESR or CRP ³ Polyarthralgia Prolonged P-R interval on ECG ⁴

Note:

- 1 When carditis is present as a major manifestation (clinical and/or echocardiographic), a prolonged P-R interval cannot be considered an additional minor manifestation in the same person.
- 2 Other causes of arthritis/arthralgia should be carefully excluded, particularly in the case of monoarthritis, eg, septic arthritis (including disseminated gonococcal infection), infective or reactive arthritis and auto-immune arthropathy (eg, juvenile chronic arthritis, inflammatory bowel disease, systemic lupus erythematosus, systemic vasculitis and sarcoidosis). Note that if polyarthriti² is present as a major manifestation, polyarthralgia cannot be considered an additional minor manifestation in the same person. References from National Heart Foundation (2006).
- 3 ESR = Erythrocyte sedimentation rate; CRP = C-reactive protein.
- 4 ECG = electrocardiogram.

Table 2 next page

Table 2 in the MoH Communicable Disease Control Manual does not distinguish the diagnostic criteria of an Initial attack from a Recurrent attack. As they are not always identical, the details that make this distinction have been copied from the ESR EpiSurv manual and follow Table 2.

Table 2: Case classification and diagnostic criteria for acute rheumatic fever

Case classification	Heart Foundation guidelines' diagnostic category	Diagnostic criteria
Under investigation	n/a	<ul style="list-style-type: none"> A case that has been notified, but information is not yet available to classify it as suspect, probable or confirmed
Suspect	Possible ARF	<ul style="list-style-type: none"> Strong clinical suspicion of ARF Insufficient signs and symptoms to fulfil diagnosis of confirmed or probable ARF
Probable	Probable ARF	<ul style="list-style-type: none"> Evidence of preceding group A streptococcal infection from positive throat culture or rapid antigen test Two major, or one major and two minor manifestations in the Jones criteria (see Table 1) <p>Or</p> <ul style="list-style-type: none"> Serological evidence of a preceding group A streptococcal infection One major and one minor manifestation
Confirmed	Definite ARF	<ul style="list-style-type: none"> Serological evidence of preceding group A streptococcal infection¹ Two major, or one major and two minor manifestations in the Jones criteria (see Table 1) are present <p>Or</p> <ul style="list-style-type: none"> Chorea (other major manifestations or evidence of group A streptococcal infection not required)
Not a case	n/a	<ul style="list-style-type: none"> A case that has been investigated and subsequently found not to meet the case definition

Note:

1 Elevated or rising streptococcal antibody titres are essential for confirming preceding GAS infection. Other laboratory tests, including culture and rapid antigen test, cannot distinguish between infection and carriage.

ESR EpiSurv Manual Initial and Recurrent criteria		
Suspect	Initial attack; requires all of the following:	<ul style="list-style-type: none"> • strong clinical suspicion of ARF. • insufficient signs and symptoms to fulfil diagnosis of confirmed or probable ARF. • no known past history of ARF.
	Recurrent attack; requires all of the following:	<ul style="list-style-type: none"> • strong clinical suspicion of ARF. • insufficient signs and symptoms to fulfil diagnosis of confirmed or probable ARF. • a past history of ARF or previously diagnosed rheumatic heart disease.
Probable	Initial attack; requires all of the following:	<ul style="list-style-type: none"> • evidence of preceding group A streptococcal infection from positive throat culture or rapid antigen test. • two major, or one major and two minor, manifestations. • no known past history of ARF. <p>OR</p> <ul style="list-style-type: none"> • serological evidence of a preceding group A streptococcal infection (i.e. elevated or rising streptococcal titres). • one major and one minor manifestation. <p>OR</p> <ul style="list-style-type: none"> • no known past history of ARF. Recurrent attack; requires all of the following: • evidence of preceding group A streptococcal infection from positive throat culture or rapid antigen test • two major, or one major and two minor, manifestations • a past history of ARF or previously diagnosed rheumatic heart disease <p>OR</p> <ul style="list-style-type: none"> • serological evidence of a preceding group A streptococcal infection (i.e. elevated or rising streptococcal titres) • one major and one minor manifestation • a past history of ARF or previously diagnosed rheumatic heart disease.
Confirmed	Initial attack; requires all of the following	<ul style="list-style-type: none"> • serological evidence of a preceding group A streptococcal infection (i.e. elevated or rising streptococcal titres) • two major, or one major and two minor, manifestations • no known past history of ARF <p>OR</p> <ul style="list-style-type: none"> • chorea ((other major manifestations or evidence of group A streptococcal infection not required). - Recurrent attack; requires all of the following: • serological evidence of a preceding group A streptococcal infection (i.e. elevated or rising streptococcal titres) • two major, or one major and two minor, or three minor, manifestations • a past history of ARF or previously diagnosed rheumatic heart disease.

	<p>CPH Rheumatic Fever Register</p> <ol style="list-style-type: none"> All notified cases should be forwarded to the Rheumatic Fever nurse (Christchurch office) for documenting on the CPH Rheumatic Fever register: Y:\CFS\ProtectionTeam\FinalDocs\notifiableConditions\RheumaticFever\RegisterReviewsAndProcesses. On HealthPathways, GPs are requested also to report patients who are or should be on penicillin prophylaxis. These forms are not to be used for notifications but are forwarded to the Communicable Diseases rheumatic fever nurse for documenting on the register (refer to electronic location link above). <p>The register held by CPH and is only used to document cases in the three DHBs.</p>
<p>Laboratory Testing</p>	
	<p>CASE</p> <p>i) Laboratory test for diagnosis of group A streptococcal infection Diagnosis of ARF is based on the Jones criteria and evidence of a preceding GAS throat infection. Currently there is no single laboratory test for ARF.</p> <p>Diagnosis of GAS throat infection:</p> <ul style="list-style-type: none"> Elevated or rising streptococcal antibody titres are essential for confirming preceding GAS infection. Other laboratory tests, including culture and rapid antigen test, cannot distinguish between infection and carriage <p>ii) Laboratory tests for Jones Minor criteria</p> <ul style="list-style-type: none"> Raised ESR (Erythrocyte sedimentation rate), CRP (C-reactive protein). <p>CONTACT GAS isolated from a household contact should be referred to the Institute of Environmental Science and Research for emm typing (<i>state on requisition form that person is a contact of a rheumatic fever case</i>). Emm typing of GAS isolated from household contacts may aid understanding of circulating GAS strains in household contacts of cases of ARF and may inform our knowledge of rheumatogenic strains in New Zealand.)</p>
<p>Management of Case</p>	
	<p>HealthPathways [<a href="http://cdhb.healthpathways.org.nz/<RheumaticFever>">http://cdhb.healthpathways.org.nz/<RheumaticFever>] outlines the Investigation, Management, Treatment and Follow up of patients from a clinical and primary care perspective).</p> <p>Patients with acute or recurrent rheumatic fever should be hospitalised and treated with antibiotics (penicillin or other antibiotic)⁴ while the diagnosis is established and further treatment is arranged. The patient should be under the care of a specialist Infectious Disease physician or paediatrician (Chch: Dr Sarah Metcalf or Dr Tony Walls).</p> <p>Investigation Initial attack:</p> <ul style="list-style-type: none"> Ascertain if the case has had sufficient investigation to confirm diagnosis (ie: throat swab, serology, ESR/CRP, echocardiogram, ECG) and that the fax is not just a report of a patient who is either on or should be on prophylactic antibiotics (this report is given to the Communicable Disease Rheumatic Fever nurse to document on the register). CPH staff to action on the day of notification. Notifying doctor to complete Rheumatic Fever Case Report Form that is either faxed to the GP by CPH, or printed off from HealthPathways: https://canterburyclassic.communityhealthpathways.org/ notifiable disease form

- For a **confirmed** case, Paediatrician/Physician to ensure arrangements are made with the practice nurse at the case's medical practice, to receive long-term penicillin prophylaxis⁴
 - **Initial attack:** In the event of an outbreak, attempt to identify the emm-type of the strain. Some emm-types are more often associated with rheumatic fever. Obtain a history of possible household contacts and recent throat infection.
 - **Recurrent attack:** As above for initial attack but also investigate the reason for recurrence. Recurrent attacks may represent a treatment failure or systems failure and should be investigated.
- Infectious Disease Physician/Paediatrician is to arrange endocarditis prophylaxis, outpatient follow up and refer to Oral Health for ongoing dental care.
- Long term prophylaxis requires strict, no later than 28 day, benzathine penicillin injections. Non-attendance will be addressed initially in primary care (Acute Demand nurses at the 24 Hour Surgery, Pegasus Community workers, the Whanau Link co-ordinator or District Nursing Service).

If there are unresolved issues the CPH rheumatic fever nurse will be contacted to try and re-connect the patient with the health system.

- Case details to be recorded on the Rheumatic Fever register:
Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\Rheumatic Fever\RegisterReviews
- Complete Case Report Form.
- On home visit identify if overcrowding or conditions are cold or damp (refer to **Counselling** below).

Restriction

Acute rheumatic fever

Cases of ARF do not require isolation unless they have known or suspected, acute GAS pharyngitis. For information on GAS management, see Reference 1.

Treatment

- Ideally all those with suspected ARF (first episode or recurrence) should be hospitalised as soon as possible after onset of symptoms and should be under the care of a specialist paediatrician or physician.
- The main priority in the first few days after presentation is confirmation of the diagnosis.
- The treating clinician is responsible for treatment, prophylaxis, education, dental referral (see **Dental Care** below), notification to public health, and informing the case's general practitioner.
- Treatment options for arthritis/arthralgia, fever, carditis/heart failure and chorea are outlined in the New Zealand Guidelines for Rheumatic Fever: 1. Diagnosis, management and secondary prevention (National Heart Foundation 2006).⁴
- One episode of rheumatic fever significantly increases the risk of further episodes, often with further cardiac damage. Antibiotic prophylaxis to prevent recurrent attacks of rheumatic fever should therefore be started before discharge from hospital.
- The appropriate duration of secondary prophylaxis depends on a number of factors, including age, clinical pattern, environment and time elapsed since the last episode of ARF.
- All cases should receive regular primary care review, and outpatient follow-up should be initiated before discharge from hospital.
- Rheumatic heart disease leads to a lifelong increased risk of bacterial endocarditis, and antibiotic prophylaxis may be required at the time of dental, oral, respiratory tract, oesophageal, gastrointestinal and genitourinary procedures.
- Patients on long term prophylaxis should be monitored 6-monthly (see **Reporting**).

Dental Care

- Ongoing dental care is essential, and each case should be referred to the Oral Health Service at the hospital. In Canterbury, dental treatment is free while the patient is on long term antibiotics.

Counselling

- At the time of diagnosis, it is essential to explain the disease process to the case and their family in a culturally appropriate way.
- There are National Heart Foundation pamphlets available.⁵
- There is also a fact sheet:
<https://www.health.govt.nz/our-work/diseases-and-conditions/communicable-disease-control-manual/rheumatic-fever>
- On discharge, all cases should have a good understanding of the cause of rheumatic fever and the need for any family member to have sore throats treated early.
- Cases and their families should understand the consequences of missing antibiotic doses.
- Also remind them of the importance of additional antibiotic prophylaxis for dental and other procedures to protect against endocarditis.
- Management of cases on long term prophylaxis is comprehensive and includes Specialist and GP visits, regular dental care and the possibility of a home insulation grant. In Canterbury the Specialist visits (at least annually), GP visits (4/year) and ongoing dental care are free (funded by the DHB). From 1 July 2015 GP visits for children <13 years are free.
- Review housing situation for overcrowding, dampness and cold conditions and if problems discuss with Housing Health Promoter at C&PH. Remediation can be assisted by:
- a letter of support for improved accommodation from the attending clinician to Housing New Zealand
- referral to the Health Monitoring and Compliance section of the CCC if a rental property, or
- referral to Community Energy Action if living in a home they own.
- The Heart Foundation website⁴ has pamphlets about rheumatic fever, the importance of treating sore throats, prophylactic injections etc. There is a pamphlet in Samoan and Tongan and information in the form of Bro' Town comics. The Starship Hospital website also has information sheets about sore throats and rheumatic fever.
- Consider 3-monthly appointments (funded) for review with the GP (optional).
- Remind patient that he/she will have an annual outpatient review by the specialist.
- Speak with case to identify contacts, particularly household contacts and document on contact tracing form/list:

<Y:\CFS\ProtectionTeam\FinalDocs\notifiableConditions\RheumaticFever\FormsStdLettersQuest\FormsContactTracingSheet181008> for investigation (throat swab), treatment and counselling.

Management of Contacts

Clustering of cases of rheumatic fever in families has been documented for more than a century. Familial clustering persists when socioeconomic factors and environment are controlled for, suggesting there is some inherited susceptibility to rheumatic fever. There is little evidence available with which to evaluate how effective contact tracing is in preventing future cases of ARF. However, streptococcal acquisition rates of 25% or greater have been recorded in family contacts of GAS pharyngitis. For further information on treatment of contacts diagnosed with GAS pharyngitis, see the *national Heart Foundation Guidelines for Rheumatic Fever: 2. Group A streptococcal sore throat management* (National Heart Foundation 2014¹)

Definition of Contacts

Contacts include all people (no age restrictions) in close contact with a case (for example, members of the case's household) during the period up to one month before the onset of illness in the case. As long as the contact is a usual member of the index case's household and was exposed to the case during the 1 month period prior to the ARF onset there is currently no upper limit on the time after the ARF onset in the case to perform contact tracing.

Investigation

(Refer to *Appendix for summary of the investigation and management of household contacts for sore throats*).

The Communicable Disease nurse to visit the home of the case and:

- take a throat swab from all household members who were living in the home in the month prior to the onset of ARF in the index case (see definition of Contacts above and follow the guidelines in the Appendix to this protocol). Request positive throat swabs are referred to ESR for emm typing (*state on requisition form that person is a contact of a rheumatic fever case*).
- If positive, treat or [arrange treatment](#) with antibiotic and provide counselling.
- If there have been three or more cases of GAS pharyngitis within a household in a 3-month period, take throat swabs from all members and [arrange treatment](#) for those who are positive. If swabbing is not practical, consider empiric antibiotic treatment (see Appendix) of the entire household (discuss with MOH).
- Assess each member for signs and symptoms of ARF and in the unlikely event of a contact being symptomatic, arrange for urgent referral to a GP (this visit will be funded by the DHB/CPH if there is an associated cost).

Restriction

- Asymptomatic contacts do not need to be restricted.
- Individuals with GAS pharyngo-tonsillitis should not attend work, school or an early childhood service or have close contact with others, if possible, until 24 hours after antibiotic treatment has started and they should not handle milk or food for other people in that time also.

Treatment

- [Contacts with positive GAS cultures should be treated by their GP or by the Communicable Diseases Nurse with an appropriate antibiotic. Treatment requires 10 days of oral antibiotics.](#)
- [An Amoxicillin Standing Order \(see below\) is available for use by the Communicable Diseases Nurse when this would facilitate timely access to treatment.](#)
- [The following contacts should be referred to their GP for antibiotics \(refer Appendix\): a household member who:](#)
 - [has had 3 or more episodes of Group A Streptococcal pharyngitis in the past three months, or](#)
 - [requires a penicillin injection, or](#)
 - [requires an antibiotic but has a penicillin allergy.](#)

- For contacts with positive throat swabs to be treated by the GP send the GP this letter:
<Y:\CFS\ProtectionTeam\FinalDocs\notifiableConditions\RheumaticFever\FORMSStdLettersQuest\Standard Letters – GPFaxGASTreatmentReqd181008>, and a copy of Algorithm 4, A Guide To Sore Throat Management.¹
- Post-treatment throat swabs are not recommended unless:
 - the contact had a history of rheumatic fever and is not receiving prophylactic IM penicillin
 - the contact developed GAS pharyngitis during an outbreak of ARF or post streptococcal glomerulonephritis
 - the contact developed GAS pharyngitis during an outbreak in a closed or partially closed community
 - there is recurrent GAS pharyngitis within the family/household
 - the contact remains symptomatic after completing their full course of antibiotics.

Information

- All contacts must be given verbal and written information about the medication, its side effects, contraindications, and interactions with other medicines (use the Amoxicillin Information sheet; see location in Associated Documents section above).
- For contacts treated by the Communicable Diseases Nurse send the GP the following letter:
<Y:\CFS\ProtectionTeam\FinalDocs\notifiableConditions\RheumaticFever\FORMSStdLettersQuest\Standard letters – GPFaxGASTreatmentSOAmoxicillin181008>

Counselling

- Advise contacts about GAS throat infection as well as its mode of transmission and the relationship of untreated disease with ARF. Also provide education on respiratory hygiene. Advise all contacts to seek early medical attention if a sore throat develops.
- There are National Heart Foundation pamphlets available.⁵
- There is also a fact sheet:
<https://www.health.govt.nz/our-work/diseases-and-conditions/communicable-disease-control-manual/rheumatic-fever>

Standing Order

Amoxicillin may be given under the Standing Order found here:

[Amoxicillin Prophylaxis Standing Order – for Rheumatic Fever Disease Contacts](#)

- Standing Orders allow prompt administration of prescription medication while ensuring that the Nurse has legal cover under the Standing Order Regulations 2002.
- Nurses 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 CPH may administer Amoxicillin under the Standing Orders.
- Amoxicillin may only be administered as specified in this procedure.
- If a Nurse acts entirely within this Standing Order and procedure, then any consequence of his/her action is the responsibility of the MOH and CPH.
- The Nurse is accountable for his/her decision-making, for application of the Standing Order and procedure, and for clear documentation of actions taken.
- The Nurse completes the Standing Order which requires his/her signature and countersigning by an MoH within 72 hours.

- The following contacts may require a different medication and must be discussed with MO/ MOH:
 - Those with contraindications.
 - Those who are pregnant.
 - Those taking other medications.
- Keep the MOH informed. Discuss individual contacts with him/her if at all concerned about:
 - any conditions a contact may have including allergies
 - unsure whether or not a contact required prophylaxis, or what prophylaxis a contact should have
 - whether any other action was required.
- All contacts must be given verbal and written information about the medication, its side effects, contraindications, and interactions with other medicines.
- Supply of Amoxicillin under Standing Orders must be documented by the Nurse on the Individual Contact Form (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

Once antibiotics have been dispensed and delivered to contacts page 2 of the RF individual contact form should be completed and faxed to their GP.

Charting and Administration Details

- Name of Medicine: Amoxicillin
- Dose/ Dosage Range:
 - Weight <30 kg: 750 mgs once daily for 10 days
 - Weight >30 kg: 1000 mg once daily for 10 days
- Amoxicillin is available as:
 - oral suspension - 250 mg/5 ml 100 ml
 - capsules – 250 mg or 500 mg
- Supplies of amoxicillin for contacts can be ordered from Christchurch Hospital Pharmacy with 24-48 hrs notice. Use Pharmacy Request Fax
Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\RheumaticFever\Orderin
gmedicationfromPharmacy\PharmacyAntibioticRequest160916.doc
- The medication is to be handed only to:
 - A person who is a contact with a positive Group A Streptococcus culture result from a throat swab.
 - A parent or caregiver of the named contact.
 - A person in the household who will pass the medicine to a contact as long as the Nurse is able to speak to the contact first.
- Amoxicillin capsules should be swallowed whole with a glass of water and food.

Contraindications, Precautions, Adverse Effects and Interactions

See Associated Documents for Medsafe Data Sheets links for complete details

Contraindications

- Known major allergy or anaphylaxis to amoxicillin, penicillin or cephalosporin or substances that serve as the vehicle or medium for amoxicillin – eg. colours, fillers or preservatives (Amoxicillin Actavis suspension contains sodium benzoate as a preservative).
- Multiple allergies

Precautions

- Previous allergic symptoms associated with amoxicillin, penicillin or cephalosporin. Amoxicillin should be avoided if infectious mononucleosis (glandular fever) is suspected.
- Prolonged use may occasionally result in overgrowth of non-susceptible organisms.
- Pseudomembranous colitis (severe and persistent diarrhoea) has been reported with virtually all broad-spectrum antibiotics.
- Prolongation of prothrombin time has been reported rarely in patients receiving amoxicillin.
- Dosage should be adjusted in patients with renal impairment. The maximum recommended dose in patients with creatinine clearance between 10 and 30mL/min is 500mg bd. The maximum recommended dose in patients with a creatinine clearance < 10mL/min is 500mg/day.

Pregnancy

- Amoxicillin may be used in pregnancy when the potential benefits outweigh the potential risks associated with treatment. Animal studies have not been associated with adverse effects. Experience in human populations have not shown an increased risk of birth defects or adverse outcomes in pregnant women taking amoxicillin compared to women who had taken no medication.

Lactation

- Amoxicillin may be administered during the period of lactation. Risk of sensitisation due to excretion of trace quantities of amoxicillin in breast milk, otherwise no adverse effects.

Adverse Effects

- Common (more than 1/100, less than 1/10), uncommon (more than 1/1000, less than 1/100), rare (more than 1/10,000, less than 1/1000), very rare (less than 1/10,000).
- Unless otherwise stated, the frequency of adverse events (AE's) has been derived from more than 30 years of post-marketing reports.
- Blood and lymphatic system disorder: Very rare. Prolongation of bleeding time and prothrombin time have also been reported rarely.
- Immune system disorders: Very rare. If a hypersensitivity reaction is reported, the treatment must be discontinued.
- Nervous system disorders: Rare. Convulsions may occur in patients with impaired renal function, epilepsy, meningitis or in those receiving high doses.
- Infections and Infestations: Uncommon. Prolonged can result in superinfections and colonisation with resistant organisms or yeasts such as oral and vaginal candidiasis.
- Gastrointestinal disorders: Common: Gastric complaints, nausea, loss of appetite, flatulence, soft stools, diarrhoea, enanthemas (particularly in the region of the mouth), dry mouth, taste disturbances. Mostly mild and frequently disappear either during the treatment or very soon after completion of course.

	<p>Occurrence reduced by taking amoxicillin during meals. Uncommon: Vomiting.</p> <ul style="list-style-type: none"> Hepato-biliary disorders: Rare. Skin and subcutaneous tissue disorders: Common: pruritus, urticarial, erythematous maculopapular rash; the typical morbilliform exanthema occurs 5 to 11 days after commencement of therapy. The immediate appearance of urticaria indicates an allergic reaction to amoxicillin and therapy should therefore be discontinued. Rare: Skin reactions such as Stevens- Johnson syndrome. Renal and Urinary tract disorders: Rare. General disorders and administration site conditions: Rare. <p>Interactions</p> <ul style="list-style-type: none"> Amoxicillin reduces the excretion of methotrexate thereby increasing the risk of methotrexate toxicity. Rarely: Prolongation of prothrombin time in patients receiving amoxicillin and oral coagulants. Appropriate monitoring should be undertaken when anticoagulants are prescribed concomitantly. Amoxicillin may affect the gut flora, leading to lower oestrogen reabsorption and reduced efficacy of oral contraceptives (http://www.medsafe.govt.nz/profs/datasheet/m/mAmoxicillincap.pdf) particularly if it causes a stomach upset or diarrhoea. Provide females of child bearing age with condoms.
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Other Control Measures

	<p>A case of ARF can be an indicator of high GAS load in the case's community. Therefore, a case of ARF in a community may warrant a range of control measures aimed at addressing GAS transmission. For more information about when and how to implement community-wide strategies to reduce rheumatic fever rates, see the National Heart Foundation's <i>New Zealand Guidelines for Rheumatic Fever: 3. Proposed rheumatic fever primary prevention programme</i> (National Heart Foundation 2009).</p> <p>Strategies that address the multiple determinants of rheumatic fever are more likely to have long-term success, including:</p> <ul style="list-style-type: none"> prevention of transmission of GAS infections, for example, by addressing household crowding and socioeconomic factors that predispose to it early detection and treatment of GAS infections, for example, by improving health literacy, health service access and early diagnosis and treatment (community- or school-based interventions may be useful) early diagnosis of ARF to reduce the risk of severe rheumatic heart disease ensuring good follow-up for antibiotic prophylaxis (secondary prevention) for those with a diagnosis of ARF. <p>Identification of source</p> <ul style="list-style-type: none"> Not applicable. <p>Disinfection</p> <ul style="list-style-type: none"> Clean and disinfect surfaces and articles soiled with respiratory secretions from infectious GAS cases. <p>Health education</p> <ul style="list-style-type: none"> Schools and general practitioners should be alerted to a case of ARF in the community. The community should be educated on the relationship between streptococcal sore throats, ARF and RHD. Public health providers should promote the key messages of the rheumatic fever prevention programme with population groups that have a high incidence of ARF. Additionally, such professionals should educate on respiratory hygiene, referral systems between health, housing and social welfare sectors and the importance of completing a full course of antibiotics.
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Reporting

- Ensure complete case information is entered into EpiSurv. Demographic and other risk factor/exposure information on the case report form is used to inform the public health response. For instructions on completing the case report forms, refer to EpiSurv website (www.surv.esr.cri.nz/episurv/crf.php).
- If a cluster of cases occurs, discuss it with the Director of Public Health at the Ministry of Health.
- In addition to public health notification and recording on EpiSurv, all cases of ARF (suspect, probable and confirmed) should be referred to and recorded on a clinical register to ensure appropriate follow-up and any necessary antibiotic prophylaxis.
- Others who should be documented on the register include cases of:
 - RHD that require secondary prophylaxis.
 - Post-streptococcal reactive arthritis.
- Refer CPH Rheumatic Fever Register in **Notification Procedure** above for documenting cases.
- Every quarter complete the quarterly Case Review/Root Cause Analysis report <Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\RheumaticFever\FormsStdLetersQuest\Forms> – QrtrlyreviewCBRootCauseAnalysisTEMPLATE, and send to the MoH. A case review/ root cause analysis form specific for South Canterbury and West Coast is also available in this folder.
- Every 6 months the Penicillin Audit form is faxed by the CPH Rheumatic Fever nurse to GPs to complete and return <Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\RheumaticFever\FormsStdLetersQuest\Forms> – RFSixMonthReviewJan-Jun[or Jul-Dec]TEMPLATE. The information is incorporated into a CPH 6-monthly rheumatic fever report to the South Island Alliance project manager for inclusion in a report to the MoH using the spreadsheet below.
- The spreadsheet <Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\RheumaticFever\RegisterReviewsAndProcesses> – Rheumatic Fever Prophylaxis Report Spreadsheet is used to collate information on the number of cases who either are or who should be receiving long term prophylaxis (for reporting to the MoH) using this form: <Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\RheumaticFever\FormsStdLetersQuest\Forms> – TimelyAntibioticProphylaxisTEMPLATE.
- Complete the quarterly case review-root cause analysis form: <Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\RheumaticFever\FormsStdLetersQuest\Forms> – Qrtrlyreview_rootcauseanalysisTEMPLATE and send to the MoH.

References and further information

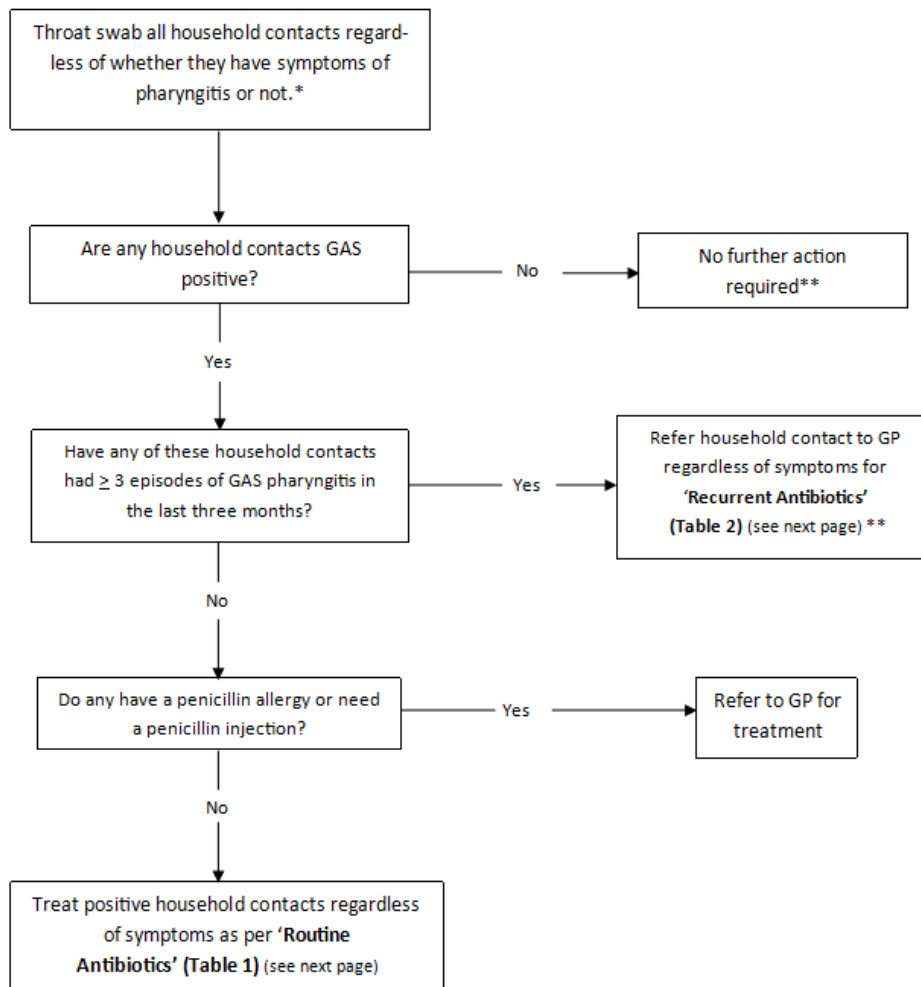
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[\[http://www.heartfoundation.org.nz/uploads/sore_throat_guideline_14_10_06_FINAL-revised.pdf\]](http://www.heartfoundation.org.nz/uploads/sore_throat_guideline_14_10_06_FINAL-revised.pdf)
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8. National Heart Foundation. 2009. *New Zealand Guidelines for Rheumatic Fever: 3. Proposed rheumatic fever primary prevention programme*. Auckland: National Heart Foundation of New Zealand.
[www.heartfoundation.org.nz/uploads/Rheumatic%20Fever%20Guideline%203\(6\)](http://www.heartfoundation.org.nz/uploads/Rheumatic%20Fever%20Guideline%203(6)) (accessed 1 December 2014).

Appendix¹

(Modified National Heart Foundation algorithm²)

Guidelines for investigating and managing household contacts of a case of rheumatic fever, for sore throats



End of antibiotic treatment throat swabbing is recommended in the following situations:

- Those with a history of rheumatic fever.
- Where there is recurrent GAS pharyngitis within families.

1. The flow diagram has been drawn in a Publisher file located in: <Y:\CFS\ProtectionTeam\FinalDocs\notifiableConditions\RheumaticFever\FrmsStdLettersQuest\Frms - AlgorithmForContactsWithSoreThroat>, and copied as a screen shot.
2. Page 14, Guidelines for Rheumatic Fever 2: Group A Streptococcal Sore Throat Management, 2014 [http://www.heartfoundation.org.nz/uploads/sore_throat_guideline_14_10_06_FINAL-revised.pdf]

* If impractical to swab consider empiric antibiotic treatment of entire household.

** Consider if social intervention is required, eg: referral to Housing NZ.

Table 1: Routine Antibiotics¹

Table 2. Standard treatment for a patient's first or second case of confirmed GAS pharyngitis

Antibiotic	Route	Dose	Duration	IDSA GRADE 2012 ⁹
Penicillin V[†]	PO	Children <20kg: 250mg two or three times daily Adolescents & Adults ≥20kg: 500mg two or three times daily	10 days	Strong, high
Amoxicillin[†]	PO	Once daily: 50mg/kg dose once daily <i>Max dose 1000mg per day</i> Or: Weight <30kg: 750mg once daily Weight ≥30kg: 1000mg once daily Twice daily: 25mg/kg dose twice daily <i>Max dose 1000mg per day</i>	10 days	Strong, high
Benzathine penicillin[‡]	IM	Children <30kg: 450mg (600,000 U) Children & Adults ≥30kg: 900mg (1,200,000 U)	Single dose	Strong, high
If concern about allergic (IgE mediated[§] or anaphylactic) response to beta lactams, use:				
Roxithromycin <i>Pending Pharmac decision</i>	PO	Children: 2.5mg/kg dose twice daily Adults: 300mg once daily Or: 150mg twice daily	10 days	Unavailable in the USA
Erythromycin ethyl succinate^{, ¶}	PO	Children & Adults: 40mg/kg/day in 2-3 divided doses <i>Max adult daily dose 1000mg</i>	10 days	**
For people on benzathine penicillin IM prophylaxis who are GAS positive:				
Treat with a 10 day course of oral penicillin or amoxicillin. Check adherence to prophylaxis programme. Serum penicillin levels will be falling by week three and four post IM long acting benzathine penicillin injection. ¹⁶				

1. Page 15, Guidelines for Rheumatic Fever 2: Group A Streptococcal Sore Throat Management, 2014
[\[http://www.ttophs.govt.nz/vdb/document/1056\]](http://www.ttophs.govt.nz/vdb/document/1056)

Footnotes *

† Amoxicillin can be taken with food whereas oral penicillin V is best absorbed on an empty stomach. Both are equally effective in eradicating GAS.

Lower frequency of antibiotic dosing has been shown to improve adherence.

Amoxicillin is relatively palatable.

‡ Benzathine penicillin can be given with lignocaine to reduce injection site pain. It may be marginally more effective than oral penicillin or amoxicillin in eradicating GAS pharyngitis.

§ IgE-mediated reactions include ANY bronchospasm, angioedema, hypotension, urticarial or pruritic rash.

|| Always check for drug interactions before prescribing. In particular, care should be taken when prescribing macrolides to patients taking warfarin and carbamazepine.

¶ The erythromycin currently funded by Pharmac is erythromycin ethyl succinate. There are other erythromycins available with different pharmacokinetic profiles.

Table 2: Recurrent Antibiotics¹

Table 14. Recommendations for Antibiotics Regimes for Third or More Episode of GAS Pharyngitis in a Three Month Period and GAS Carriage

Antibiotic	Route	Dose	Duration	References	IDSA Evidence Rating 2012
Benzathine penicillin ^{†,‡}	IM	Children <30kg: 450mg (600,000 U) Adults & children ≥30kg: 900mg (1,200,000 U)	One dose	Stollerman 1955 ³⁴⁶	§
Antibiotic options requiring Specialist Approval[¶]:					
Benzathine penicillin ^{†,‡} and rifampicin ^{§,¶}	PO and IM	Benzathine penicillin: Children <30kg: 450mg (600,000 U) Adults & children ≥30kg: 900mg (1,200,000 U) Plus Rifampicin starting day of benzathine penicillin injection for 4 days: 20mg/kg/day orally in two divided doses Max dose 600mg daily	One dose 4 days	Tanz 1985 ³⁴⁶	Strong, high
Clindamycin ^{¶,¶¶}	PO	150mg three times a day Max dose 450mg a day	10 days	Tanz 1991, ³⁴⁷ Shulman 2012 ⁹	Strong, high
Penicillin V [†] and rifampicin ^{§,¶}	PO	Penicillin: 50mg/kg/day in 4 divided doses for 10 days Max dose 2000mg daily Plus Rifampicin for last 4 days (days 7-10): 20mg/kg/day in one single dose daily Max dose 600mg daily	10 days	Chaudhary 1985, ³⁴⁸ Shulman 2012 ⁹	Strong, high
Amoxicillin ^{†,††} with rifampicin ^{§,¶}	PO	Amoxicillin for 10 days: Once daily: 50mg/kg once daily Or Weight < 30kg: 750mg once daily Weight ≥ 30kg: 1000-1500mg once daily Twice daily: 25mg/kg twice daily Max dose 1000-1500mg daily Plus Rifampicin for last 4 days (days 7-10): 20mg/kg/day in one single dose daily Max dose 600mg daily	10 days	¶¶	§§
Antibiotic options not requiring Specialist Approval:					
Cephalexin ^{†,§§}	PO	Children: 20mg/kg/dose twice daily Max dose 500mg twice daily Adults: 500mg twice daily	10 days	¶¶	§
Amoxicillin, ^{†,††,¶¶} clavulanic acid	PO	40mg/kg/day of amoxicillin divided into 3 doses daily Max 2000mg of amoxicillin daily	10 days	Kaplan 1988 ³⁴⁹	Strong, moderate
Ask about adherence to antibiotic regime, recommend family/household screening and consider end of treatment swab.					

1. Page 66. Guidelines for Rheumatic Fever 2: Group A Streptococcal Sore Throat Management, 2014
http://www.heartfoundation.org.nz/uploads/sore_throat_guideline_14_10_06_FINAL-revised.pdf