NSW Health

Invasive Group A Streptococcal Disease

NSW Control Guideline for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.0	16 September 2016	Communicable Diseases Branch	Development of the guideline
2.0	29 July 2022	Communicable Diseases Branch	Updated to reflect iGAS becoming a notifiable condition in NSW and align with current clinical guidance
3.0	05 December 2023	Communicable Diseases Branch	Addition of probable case definition. Deep wound, deep tissue specimen moved from laboratory definitive evidence to lab suggestive evidence. PHU follow-up time for routine cases reduced from 5 to 3 working days. Timeframe for institutional outbreaks increased from 30 days to 3 months.

NSW specific iGAS guidance

This guideline is based on the Invasive Group A Streptococcal (iGAS) Disease – Communicable Diseases Network Australia (CDNA) National Guidelines for Public Health Units. NSW specific guidance and recent updates to the CDNA Series of National Guidelines (SoNG) are included within these call-out boxes throughout the document. The content of the CDNA SoNG has not been modified.

Invasive Group A Streptococcal (iGAS) Disease

CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.0	18 August 2023	Developed by iGAS SoNG Working Group	Endorsed by CDNA 18 August 2023 Endorsed by AHHPC 9 October 2023

Disclaimer

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for Invasive Group A *Streptococcal* (iGAS) disease. The intention of these guidelines is to reflect the current available evidence base, with pragmatic guidance provided where evidence is still evolving. Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will continue to review and update these guidelines as new information becomes available on iGAS and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

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Contents

1. Summary

Public health priority

Priority classification	Public health response timeline
High	For birthing person[1]-neonate pairs and clusters, applicable public health action should be initiated within 1 working day of notification.
Routine	For all other cases, applicable public health action should be initiated within 3 working days of notification.

[1]Birthing-person" refers to someone who gives birth, regardless of their gender identity, which may be female, male, nonbinary, or other, and regardless of their relationship with the neonate (e.g., surrogate pregnancy).

Case management

Initiate public health response within 1 working day of notification for birthing person-neonate pairs, and within 3 working days of notification for all other cases, both probable[2] and confirmed. Isolate case and practice standard and droplet precautions until 24 hours after initiation of appropriate and effective antibiotic treatment. Exclude case from child-care, school, other educational institutions, or work, until 24 hours after initiation of effective antibiotic treatment.

[2]Probable cases should be notified to the NNDSS from 1 January 2024 onwards.

Contact management

Provide information to all identified close contacts of both probable and confirmed cases and liaise with treating clinical teams for antibiotics for chemoprophylaxis to be given to eligible close contacts.

2. The disease

Infectious agent

The infectious agent is *Streptococcus pyogenes,* also known as Group A *Streptococcus* (GAS), a Gram positive, ß-haemolytic bacterium.

Reservoir

Humans.

Mode of transmission

GAS is spread through direct person-to-person transmission, via droplet spread or direct contact with patients or carriers. Typically, transmission occurs through respiratory droplets but can also occur through contact with secretions (such as saliva, wound discharge, or nasal secretions) from an infected person, or through skin-to-skin contact.

People with GAS disease (e.g., pharyngitis or impetigo) are much more likely to transmit the bacteria to others than asymptomatic carriers. GAS infection is rarely transmitted by indirect contact through objects.

Incubation period

The incubation period for iGAS is not well defined (1,2). Cases of iGAS may be preceded by superficial non-invasive GAS infections, such as GAS pharyngitis (incubation period is usually 1 to 3 days) or GAS impetigo (estimated incubation period is 7 to 10 days).

Secondary cases of iGAS infection have been identified up to 30 days after the identification of the initial case, though this is rare (3,4).

Infectious period

For contact tracing purposes, iGAS cases are considered infectious from 7 days before onset of GAS-related symptoms until 24 hours after commencement of appropriate antibiotic treatment. The 7 days prior to onset is included to account for a potential period of communicability related to asymptomatic carriage and to capture the source.

Clinical presentation and outcome

There are a range of clinical presentations related to GAS infections. These include common mild illnesses such as scarlet fever, tonsilitis or pharyngitis (also known as “strep throat”) and skin or soft tissue infections such as impetigo or cellulitis. In rare instances, GAS infections can lead to invasive GAS (iGAS).

Invasive GAS disease is defined by the isolation of GAS from a normally sterile site, such as blood, cerebrospinal fluid, or bone marrow. GAS can enter these sites through a break in the skin (e.g. a cut, puncture, or surgical wound), or via exposure to respiratory or wound secretions from a person carrying the bacteria.

Presentations may include bacteraemia, sepsis, empyema, osteomyelitis, septic arthritis, meningitis, puerperal sepsis, and life-threatening conditions such as streptococcal toxic shock syndrome (STSS) and necrotising fasciitis. Necrotising fasciitis (NF) can lead to life-long complications such as limb-loss and severe scarring, and in approximately 20-30% of cases, death (5). STSS can have similar complications to NF and the case fatality rate is approximately 30% (6). In cases where patients have NF and STSS concurrently, a case-fatality rate of up to 30% has been observed (7).

People at increased risk of disease

Birthing person-neonate pairs

Birthing person-neonate pairs are considered to be the highest risk group for secondary iGAS infection. Though evidence is limited, the relative risk of secondary infections in birthing person-neonate pairs has been estimated at 12-times higher than other close contacts of a case (3).

Household contacts of a case

While the available evidence is limited and variable, a range of small studies have found increased risk of secondary iGAS cases in household contacts of cases, ranging from 19 times higher than the general population to over 2,000 times higher (3,8,9).

While an increased risk of infection has been noted in all household contacts of iGAS cases compared to the general population, secondary cases among household contacts are rare (10).

Elderly contacts of a single case in a household or household-like setting have been identified as at higher risk for secondary iGAS infection than other household contacts (3,11).

Residents or attendees of institutional settings

Institutions can refer to a range of settings outside the home where people may reside (short-term or long-term) or attend for care or schooling, including, but not limited to:

- Childcare centres
- Aged care or residential care facilities
- Prisons and jails
- Hospitals
- Schools
- Military barracks
- Hostels or shelters

Outbreaks of iGAS infection in aged care facilities, hospitals, and childcare facilities are well-documented in the literature both in Australia and internationally, with aged care facilities being the most frequently reported setting of iGAS outbreaks (12–31).

Other institutional settings where there is likely to be close contact between residents and attendees, high density living with potential for overcrowding, and poor hygiene (such as prisons, military barracks, hostels, and schools) are generally understood to have a higher baseline risk for communicable disease transmission (32–34). However, evidence specific to the increased risk of iGAS transmission in these institutions is not well documented in the literature.

Communities of people experiencing homelessness or utilising safe-injecting rooms or other community-based harm-reduction facilities, can experience increased risk of iGAS infection, and whole genome sequencing has identified connections between apparently sporadic cases in these communities (35–37). However, as these cases are often linked to risk behaviours (such as shared needle use) and environmental exposures rather than facilities, they are referred to in these Guidelines as ‘community outbreaks.’

Other priority groups

There are a number of environmental, sociodemographic and health risk factors that can lead groups of people to experience increased risk of iGAS infection, such as:

- Overcrowding in a household setting or other high-density living environments with potential for overcrowding (such as correctional facilities or aged care facilities).
- Receiving wound care in environments or settings with inadequate infection prevention and control practices.
- Frequent skin infections or wounds.
- Shared needle use.
- Poor hygiene environments.
- Chronic disease (particularly diabetes and heart disease).
- Immunocompromising conditions (such as those in receipt of chemotherapy or high-dose steroids).
- Experiencing discrimination in healthcare or barriers to in accessing appropriate healthcare services.

Groups who may experience some of these risk factors at a higher rate than the general population include Aboriginal and Torres Strait Islander people, the elderly, people experiencing homelessness, people experiencing poverty, people who inject drugs, and children aged <5 years (15,17,20,27,32,37–44).

Post-surgical, postpartum, and burns patients are also at increased risk of infection; as broken

cutaneous or mucosal barriers may facilitate invasive infection after exposure to GAS (8, 10). Acute viral respiratory infections, particularly influenza, are risk factors for developing iGAS (45), and in children, varicella (chickenpox) infection has been noted as a risk factor (46,47).

Disease occurrence and public health significance

Internationally, the reported incidence in high-resource countries is estimated to be between 2 and 4 cases per 100,00 population, per year (8). At the time of writing, the national incidence of iGAS in Australia is unclear. iGAS became nationally notifiable in Australia from 01 July 2021, and while some jurisdictions had been collecting data on iGAS for up to a decade prior to this time, iGAS did not become notifiable in all jurisdictions until September 2022 (see Table 1).

Table 1: Month and year that iGAS became notifiable in each Australian State and Territory

Jurisdiction	Month and year iGAS became notifiable
Australian Capital Territory	February 2022
New South Wales	September 2022
Northern Territory	May 2011
Queensland	December 2005
South Australia	October 2021
Tasmania	July 2022
Victoria	February 2022
Western Australia	August 2021

Several cohort studies, linked data studies and analyses of data collected by jurisdictions provide some insight into the estimated incidence of iGAS in Australia:

- NSW hospitalisation data for iGAS bacteraemia for the period 2010 to 2020 found a hospitalisation rate of 4.0 admissions per 100,000 population, per year in 2017 and rates were highest in people in northern and western NSW. Rates for Aboriginal and Torres Strait Islander people were twice as high as rates in non-Indigenous people (48).
- In the Northern Territory, iGAS notification data from 1 May 2011 to 30 April 2021 found an average rate of 28.2 per 100,000 population per year, and that over half of cases over the period were female (55%). The case fatality rate for the period was 6% and outbreaks were detected on 4 occasions. Among the cases notified during this period, 66% had a pre-existing chronic medical condition (commonly type 2 diabetes or kidney disease) and notification rates in Aboriginal and Torres Strait Islander people were 8 times higher than rates in non-Indigenous people. A high incidence of iGAS among haemodialysis patients (2,205 per 100,000 person-years in the dialysis population) has also been observed in the Northern Territory (49).
- In Queensland, iGAS notification data between 2006 and 2015 found an incidence rate of 4.5 notifications per 100,000 per year. Notification rates in Aboriginal and Torres Strait Islander people were 8 times higher than rates in non-Indigenous people (50).
- A linked data study of identified cases of iGAS in Victoria between 1 January 2007 and 31 December 2017 found a median annual incidence of 3.1 cases per 100,000 population. Of the 88% of cases with hospitalisation information in the study, 33% were admitted to an intensive care unit. The case fatality rate was 5.6% over the study period, reaching 13.5% among those aged ≥75 years. The study also found a sharp increase in cases in 2017, where the incidence rate was the highest for the study period (5.2 cases per 100,000 population per year) (51).

- A cohort study of hospital data from seven major Australian paediatric centres for the period 1 July 2016 to 30 June 2018 estimated a mean annual minimum incidence rate of 1.6 per 100,000 children (aged 18 years and younger) across the study period (6).
- A population-based data linkage study of Western Australian hospital, pathology and deaths data found 2,337 cases of iGAS within the study period (1 January 2000 to 31 December
- 2018). Age-standardised incidence rates increased from 2 per 100,000 population in 2000 to 9.1 per 100,000 in 2017 (per year, adjusted for age group and sex). The study found that more than half of cases were in boys or men, the median age of cases was 44 years and over a third of cases were in Aboriginal and Torres Strait Islander people. Incidence rates among Aboriginal and Torres Strait Islander people were consistently higher than those for non-Indigenous people across the study period, with rates for Aboriginal and Torres Strait Islander people ranging up to 13 times higher than rates for non-Indigenous people. The study did not find any evidence of seasonal trends (52).
- At the time of writing, there were no published studies or guidelines about the incidence rate of iGAS in the ACT, Tasmania, or South Australia. As iGAS has been notifiable in these jurisdictions for less than a year, preliminary incidence rates from national level data have not been included. Where practicable, these states may wish to use the reported incidence rates of neighbouring jurisdictions as an estimate of their baseline iGAS rates.

Seasonality of iGAS disease at the national level in Australia has not been well-established, though some evidence from Victorian studies suggests cases may increase during periods of increased influenza circulation (53). Internationally, studies from other high-resource countries have found seasonal peaks in winter to early spring (54–57) and, in some instances, differing seasonal peaks depending on *emm* type (58).

Public health management of iGAS and associated conditions can be complex and demanding. This is related to the potential for serious complications and death, the fact that incidence is highest among certain populations, including those with potentially complex sociodemographic factors (such as birthing person-neonate pairs, Aboriginal and Torres Strait Islander people, infants, and the elderly) and that clusters of cases may occur.

3. Routine prevention activities

- Primordial prevention aimed at reducing the levels of GAS circulating in the population through improved social determinants of health (including housing, health hardware, and education about basic hygiene practices).
- Institutional settings can reduce risk by following infection prevention and control practices and encouraging basic hygiene practices.
- Primary prevention focusing on the early detection and treatment of GAS infections (throat and skin infections) in line with clinical practice guidelines, including the Sore Throat Clinical Practice Guidelines and the National Healthy Skin Guideline.
- There is currently no vaccine available for GAS.

4. Surveillance objectives

- To monitor the epidemiology of the disease to inform prevention strategies.
- To promptly identify cases and any high-risk close contacts in order that appropriate public health action can be taken.
- To identify clusters of cases in order that appropriate public health action can be taken.
- To monitor the effectiveness of current control measures and to provide an evidence base for

further review of national guidelines.

5. Data management

In accordance with the assigned public health priority levels, confirmed and probable cases of iGAS disease should be entered onto the notifiable diseases database within:

- 1 working day for birthing-person neonate pairs, and
- 3 working days for all other cases.

Ensure that data on Aboriginal and Torres Strait Islander status is collected and entered into the jurisdictional database. Typing results and case outcome should be added to the database when available.

> **NSW specific iGAS guidance**
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> Symptoms of illness field should be completed in NCIMS if possible.

6. Case definition

Both **confirmed cases** and **probable cases**[3] should be notified.

Pathology laboratories should notify **confirmed cases** of iGAS to public health.

Diagnosing clinicians, including clinical microbiologists, should notify **probable cases** of iGAS to public health.

[3]Probable cases will be notified to the NNDSS from 1 January 2024

Confirmed case

A confirmed case requires **laboratory definitive evidence** only.

Probable case

A probable case requires **laboratory suggestive** AND **clinical suggestive evidence**.

Laboratory definitive evidence

Isolation or detection of *Streptococcus pyogenes* by culture or molecular methods (such as polymerase chain reaction [PCR]), from a normally sterile site (such as blood, cerebrospinal fluid, pleural-peritoneal-pericardial fluids, joint aspirate, or bone [see Appendix 3 for the complete list]).

Laboratory suggestive evidence

Isolation or detection of *Streptococcus pyogenes* by culture or molecular methods (such as PCR), from a non-sterile site including deep tissue or abscess at operation or post-mortem.

Clinical suggestive evidence

Clinical presentation consistent with severe invasive GAS infection such as:

- streptococcal toxic shock syndrome (STSS) that includes both hypotension and multi-organ failure
- necrotising fasciitis (NF)
- puerperal and/or neonatal sepsis.

7. Laboratory testing

Test method

Bacterial culture is the current gold standard for GAS confirmation, however NAAT assays are also available for blood and sterile tissues and fluids.

Traditional agar plate culture methods (combined with Gram stain which is suggestive but non-specific) rely on incubation in a carbon dioxide added atmosphere to enhance growth.

Identification relies on a combination of traditional methods (no single method is perfect) and includes: (i) Gram stain morphology, (ii) beta-haemolysis on blood agar plates, (iii) Latex agglutination (Lancefield) grouping, differentiating from other species, (iv) bacitracin sensitivity, and (v) PYR testing assay, is used for the detection of pyrrolidonyl arylamidase enzyme (also called pyrrolidonyl aminopeptidase) activity in GAS. MALDI-TOF is also a validated method of identification, as are commercial biochemical panels.

NAAT testing can include commercial molecular panels or in-house detections. One molecular target amplified is the highly conserved sdaB gene, which encodes for DNase B, an extracellular antigen of GAS, and the basis for the anti-DNase B antibody test used to substantiate a likely GAS infection. An alternative target is speB, also highly conserved, and it encodes for streptococcal pyrogenic exotoxin B or SPEB, a cysteine protease, major virulence factor, and superantigen whose expression mediates toxic shock, seen with various syndromes of severe acute pyogenic infections due to GAS.

Both of these target genes are specific for GAS, and both are single gene copies in the *Streptococcus pyogenes* chromosome.

Serology (ASOT and Anti-DNAase b) is available and may be useful in assisting diagnosis of GAS immune mediated syndromes such as acute rheumatic fever but is not sufficient for iGAS diagnosis.

Suitable specimen types

Blood culture (sterile procedure), cerebrospinal fluid (CSF), body fluid from a normally sterile site (such as syringe aspirate), surgical biopsy material (i.e., fasciitis), pus and swabs (with transport media).

Post-mortem specimens may be collected but interpretation requires consideration of specimen type, disease causing death, and time from death to specimen collection, due to the effects of post-mortem bacterial translocation.

Specimen collection and handling

Keep specimens moist and collect into sterile containers. Use sterile saline wrapped gauze if necessary to avoid surgical specimens drying out.

Test sensitivity

Nucleic acid testing offers an alternative way to improve speed and accuracy in GAS diagnosis and has been shown to have superior sensitivity and specificity compared to conventional throat cultures and pharyngitis and clinical diagnosis. Similar studies have not been conducted for iGAS and culture positivity rates can be influenced by specimen collection, handling during transport and time to processing.

Strain differentiation

Various typing systems are available for epidemiological purposes. GAS has been classically subdivided based upon serotyping of surface-expressed M and major pilus subunit protein T typing. M-typing using specific antisera has been largely replaced by emm-typing, by DNA sequencing the variable region of the emm gene. While useful it may not be specific enough when common emm types occur geographically, hence multi-locus sequence typing (MLST) and the even more specific whole genome sequencing (WGS) are also used. Emm type of GAS strains can also be determined from the WGS results.

Antimicrobial susceptibility

GAS remains universally penicillin sensitive. However alternative agents are also tested due to patient allergies and include vancomycin, macrolides, trimethoprim/sulfamethoxazole, and clindamycin. Though usually susceptible antimicrobials develop resistance, such as clindamycin which may develop constitutional or inducible reduced susceptibility.

Testing is classically done by phenotypic disc-based methods, but Minimum Inhibitory Concentration (MIC) testing and broth microdilution are also available. Breakpoints and standardised methods are protocol based on either EUCAST (European Committee on Antimicrobial Susceptibility Testing) or CLSI (Clinical and Laboratory Standards Institute).

Mutations in GAS penicillin binding protein genes have been noted in many countries but have not yet caused penicillin resistance but do confer some reduced susceptibility to other beta lactam antibiotics.

8. Case management

Response times

Case investigation and appropriate public health action for probable and confirmed cases should commence within:

- 1 working day of notification for birthing-person neonate pairs, noting that earlier action should be undertaken where possible. As these cases are managed in a hospital setting, the treating clinical team should implement chemoprophylaxis in a timely manner, with PHU follow up confirming appropriate management has occurred.
- 1 working day of notification for two or more epidemiologically linked cases (see Section 11: *Special Situations*).
- 3 working days for all other cases.

Case investigation

The response to a notification will usually be carried out in collaboration with the case's treating clinical team. As such, public health response procedures for both confirmed and probable cases should include the following actions:

- Identify whether the case is part of a birthing person-neonate pair, or works, attends, resides, or may have acquired their infection in an institutional setting or facility (i.e. childcare centre, aged or residential care facility, prison, or hospital).
- Liaise with the treating clinician and/or nursing team to obtain demographic details and determine whether antibiotics for chemoprophylaxis or education materials have been provided to the case and applicable close contacts.
- If proceeding to contact the case and/or next of kin, confirm with the treating clinician whether

the case or guardian is aware of the diagnosis.

- Endeavour to provide an appropriate fact sheet to close contacts (Appendix 2). Factsheets may be provided to contacts by the treating clinician, the case or their next of kin.
- If it is identified that the case works, attends, or resides in an institutional setting or facility (particularly residential care facilities or childcare):
    - Provide information to the institution or facility manager for distribution.
    - Request the institution or facility report any further iGAS cases occurring within 3 months for residential care facilities and 30 days for all other institutional settings.
    - Consider undertaking a review of notifications for other iGAS cases that may be linked to the facility or institution.
- Liaise with the treating clinician to facilitate the support of the case and/or family with a social worker, Aboriginal or Torres Strait Islander Liaison Officer or interpreter as required.

Case treatment

Treatment is the responsibility of the treating clinician. For antibiotic treatment recommendations refer to the current edition of *Therapeutic Guidelines: Antibiotic*.

Isolation and restriction

Cases should be managed using appropriate standard and droplet transmission-based precautions until completion of 24 hours of treatment with appropriate antibiotics, as per the Australian Guidelines for the Prevention and Control of Infection in Healthcare. This is applicable to any setting where the case is being treated, including healthcare facilities and residential care facilities.

9. Control of environment

None routinely required.

> **NSW specific iGAS guidance**
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> For management of iGAS in Aboriginal communities, see Section 11: *Special Situations*

10. Contact management: contacts of a single case

Identification of contacts

The aim of identifying contacts is to:

- Identify those who may be the potential source of the GAS strain that has led to a case of iGAS and to identify those who may be at increased risk of having been exposed to that GAS strain.
- Provide contacts with information about iGAS infection and their level of risk aimed at both allaying unnecessary anxiety and advising them of what action to take if they develop symptoms.
- Recommend and coordinate provision of antibiotics for chemoprophylaxis if indicated (Table 2).

Contact definitions

For a single case of iGAS, public health follow-up focuses on identifying the subsets of close contacts who require information only, and those who may also require antibiotics for chemoprophylaxis.

Contact groups for which information and antibiotics for chemoprophylaxis should be routinely provided:

1. Birthing person-neonate pairs: where either the birthing person or neonate develop iGAS disease during the first 28 days after birth.

Contact groups for which information should be routinely provided:

1. Household or household-like contacts:
    a) any person who spent at least 24 hours (cumulative) in the same household or household-like setting with the case during the case's infectious period or,
    b) had sexual relations, or other intimate contact with a case during the case's infectious period.
2. Institutional contacts:
    a) Child-care contacts: any child, staff member or child carer (paid or unpaid) who spent at least 8 hours at the same childcare centre as a confirmed case of iGAS during the case's infectious period.
    b) Other institutions: any resident, attendee or staff member who worked at or resided in the same institution or facility (e.g., residential aged care or disability facility, shelter, dormitory, hostel, prison, military barracks, hospitals etc.) as the case during the case's infectious period, for at least 24 hours. Particularly, residents sharing a room with a case and any staff member who provided airway or wound care for a case where appropriate transmission-based precautions were not used.
    c) A risk assessment should be undertaken for institutional settings to determine risk areas and inform where public health action is required. Where there is physical separation between sections of an institution or facility with negligible crossover of residents, attendees, and staff, only the residents, attendees, and staff in the affected sub-division (e.g., dormitory, hostel room or prison sub-division) will be considered contacts. Wards in healthcare settings where the case was a longer-term patient and/or had substantial interaction with other patients should be considered, noting that those sharing a room on a hospital ward may meet household or house-like contact definition.
3. Airway exposed healthcare workers: healthcare workers who have had unprotected close exposure of their airway to large particle respiratory droplets of a case during airway management (e.g., suctioning, intubation), or mouth to mouth resuscitation within the infectious period. Provision of information regarding risk exposure for airway exposed healthcare workers is the responsibility of the hospital, however PHUs should ensure appropriate management has been undertaken.

These categories have been developed based on the limited evidence available regarding the public health management of close contacts of a single case of iGAS.

NSW specific iGAS guidance

For institution contacts (as described above), contact during the case's infectious period is considered cumulative. Where cases are hospitalised in a shared ward, risk to other patients should be considered in relation to the timing and degree of exposure. Unless there is close interaction with the case for a cumulative period of at least 24hrs during the case's infectious period, other patients are not considered contacts.

Contact information for childcare and aged care facilities is included in Appendix 4 and Appendix 5 respectively.

Populations at increased risk

Some people who fall into the above close contact categories may have additional risk factors that contribute to iGAS infection risk. According to the limited evidence available (as outlined in Section 2: *Other priority groups* and Section 2: *Disease occurrence and public health significance*) the following groups may be at higher risk at baseline for iGAS infection:

- Aboriginal and Torres Strait Islander people
- elderly people (particularly those aged >75 years)
- children aged <5 years
- people with a chronic or immunocompromising disease or condition
- haemodialysis recipients
- people who inject drugs
- people experiencing homelessness
- people residing at or attending institutions prone to poor hygiene, contact with bodily fluids or overcrowding (such as prisons, hospitals, military barracks etc.)
- other special risk groups unique to states or territories.

These risk factors may be considered by PHUs and treating clinical teams when determining most appropriate management for contacts of a single case. PHUs may also wish to consider severity of disease in these determinations.

Education

When close contacts of a case are identified, provide an information fact sheet to these contacts about the disease and how it is spread as soon as possible, noting this may occur via the treating clinician, case or next of kin. Where the PHU is relying on a clinician, case or next of kin to identify and disseminate information to contacts, they should provide advice on close contact identification. It is acknowledged that depending on the method adopted to disseminate information to contacts, there may be variability in completeness of contact identification.

Information in the fact sheet in Appendix 2 can be adapted for the cultural and literacy needs of recipients, but all fact sheets provided to contacts should include the following information and advice:

- close contacts may be at higher risk of developing iGAS disease for up to a 30-day period following last contact with a case,
- symptoms of GAS and iGAS to monitor for,
- if symptoms of GAS develop (e.g., impetigo, pharyngitis), contacts should seek non-urgent medical review,
- if symptoms of iGAS develop, contacts should seek immediate medical attention.

In instances where a single case has occurred in an institutional setting, appropriate fact sheets should be provided to facility management for circulation as appropriate to staff, residents or, in the case of a childcare centre, to parents of attendee children.

Chemoprophylaxis

Routine provision of antibiotics for chemoprophylaxis to all close contacts of a single case is generally not recommended, as evidence of the efficacy of this strategy in preventing secondary cases is limited (3).

Based on this limited evidence, these Guidelines suggest routine provision of antibiotics for chemoprophylaxis by PHUs for birthing parent-neonate pairs *only* (Table 2). PHUs may wish to adopt

a risk-assessment based approach for all other contact types on a case-by-case basis in cooperation with the treating clinical team, taking into account factors outlined in the *Other priority groups* and *Populations at increased risk* sections of this document.

Decisions to provide antibiotics for chemoprophylaxis to any close contacts of a single case should take into account the benefits and risks including:

- individual risks factors for developing iGAS
- the specific context of a case and their close contacts
- the risk of side effects, and
- other potential consequences of providing antibiotics to asymptomatic persons (i.e., elimination of protective flora, or potential to develop antibiotic resistance).

Antibiotics for chemoprophylaxis should be given to eligible contacts of a single case of iGAS as soon as possible after the contact is identified, preferably within 48 hours of exposure to the original case or, at least, within 48 hours of the case being notified, noting that the utility of administering antibiotics for chemoprophylaxis beyond 10 days of iGAS diagnosis in the initial case is limited. As of August 2023, *Therapeutic Guidelines: Antibiotic – Prophylaxis regimens for invasive iGAS infection* indicates that the optimal antibiotic prophylaxis regimen for iGAS infection has not been determined but suitable regimens include:

1. benzathine benzylpenicillin intramuscularly*, as a single dose[#]
    - adult: 1.2 million units (2.3 mL)
    - child less than 10 kg: 0.45 million units (0.9 mL)
    - child 10 kg to less than 20 kg: 0.6 million units (1.2 mL)
    - child 20 kg or more: 1.2 million units (2.3 mL)

OR

2. cefalexin 1 g (neonate and child: 25 mg/kg up to 1 g) orally, 12-hourly for 10 days.

* The ventrogluteal site is preferred for administration of intramuscular benzathine benzylpenicillin because of reduced pain and risk of nerve injury. For instructions on intramuscular injection at the ventrogluteal site, see Figure 2.57

[#] It is unclear if eradication of pharyngeal group A *streptococcus* carriage is required to prevent secondary cases. Limited evidence suggests the addition of rifampicin to benzathine benzylpenicillin increases the rate of pharyngeal carriage eradication.
However, the role of rifampicin in the prevention of secondary invasive group A *streptococcal* infection is uncertain, and routine combination prophylaxis is not recommended.

For close contacts with delayed non-severe hypersensitivity to penicillins, cefalexin can be used in most cases[^].
For close contacts with immediate (non-severe or severe) or delayed severe hypersensitivity to penicillins, antibiotic choice depends on the susceptibility of the isolate from the index case (as rates of resistance to non–beta-lactam antibiotics are higher). If susceptibility results are not available, a reasonable regimen is:

- azithromycin 500 mg (child: 12 mg/kg up to 500 mg) orally, daily for 5 days.

[^] It is safe to use cefalexin in patients who had a delayed non-severe reaction to a penicillin in the distant past. It is also safe to use cefalexin in patients who have had a delayed non-severe reaction recently, unless the reaction involved amoxicillin or ampicillin, because cross-reactivity between these drugs is possible. For patients who have had a recent delayed non-severe reaction to amoxicillin or ampicillin, use the drug recommended for patients with immediate (non-severe or severe) or delayed severe hypersensitivity

Recommendations in these Guidelines regarding the provision of antibiotics for chemoprophylaxis to close contacts of a single case are not intended as a substitute for the expert knowledge of treating clinical teams, nor are they intended to override jurisdictional best practice in accordance with their specific populations and contexts. Decisions about antibiotics for chemoprophylaxis must always take into account the individual and population risks and benefits of this intervention.

Table 2: Recommended public health responses for close contacts of a single case of invasive Group A *Streptococcus* infection, by contact type*

Contact group	Routine provision of antibiotics for chemoprophylaxis recommended?	Provision of fact sheet recommended?^
Birthing-parent neonate pairs	**YES**	**YES**
Other household or household-like contacts	**NO#**	**YES**
Institutional contacts	**NO#**	**YES**
Airway-exposed healthcare workers~	**NO**	**YES**

*PHUs should be aware of and implement public health jurisdictional guidelines, where these may be different from the CDNA guidelines. It is not the responsibility of Public Health Units (PHUs) to undertake contact management based on guidelines of individual hospitals if these differ from public health jurisdictional or CDNA guidelines.
Chemoprophylaxis may be considered by PHU and treating clinicians for contacts with additional individual risk factors on a case-by-case basis.
^Fact sheets may be provided by PHUs for distribution to contacts to the following groups: cases, treating clinical teams of a case, family members/next of kin of a case and facility management for distribution to institutional residents or attendees.
~Where these occur in a hospital setting, contact management of airway-exposed healthcare workers should be undertaken by the hospital, however PHUs should ensure appropriate management has been undertaken.

11. Special situations

Household clusters

Definition

Where two or more cases of iGAS infection occur in the same household or household-like setting within 30 days of symptom onset in the initial case.

Management

In the event of a household cluster, the entire household should be offered antibiotics for chemoprophylaxis as per *Therapeutic Guidelines: Antibiotic – Prevention of invasive group A streptococcal infection* and provided with the appropriate fact sheet. This includes all persons ordinarily resident in the affected household regardless of whether they were identified as a contact of a case.

Where a secondary case is identified after the initial case has completed a course of antibiotics, the initial case does not require additional antibiotics for chemoprophylaxis.

Specimens from household clusters should be sent to a reference laboratory for molecular typing. The administration of antibiotics for chemoprophylaxis to the household should not be delayed while waiting for molecular typing results.

NSW specific iGAS guidance

For Aboriginal people, decisions around contact tracing in the event of a household cluster should be made in collaboration with the family, or family champion, for a tailored and individual response that is realistic and achievable for the family/household. See *Aboriginal and Torres Strait Islander people* below for further information.

Clusters in institutional settings

Where two or more cases of iGAS infection occur in an institution within 3 months of onset in the initial case. Institutions can include, but are not limited to:

- Childcare centres
- Schools
- Aged care or residential care facilities
- Prisons
- Hospitals
- Hostels
- Military barracks.

For clusters in hospitals, utilise the below guidance in conjunction with hospital guidance or applicable jurisdictional guidance for special risk groups in healthcare (i.e., dialysis patients in the Northern Territory).

Definition

Confirmed cluster: 2 or more cases that are epidemiologically linked within an institution that occur within a 3-month period and are identical on molecular typing where cases are not household contacts of each other.

Possible/suspected cluster: 2 or more cases that are epidemiologically linked within an institution that occur within a 3-month period where cases are not household contacts of each other.

Epidemiological link: Where cases occur in a physical or geographical context and a plausible mode of transmission accounts for infection spreading between people.

Management

For the purposes of initiating public health management, it is preferable that a cluster be confirmed via molecular typing prior to response. However, if there is strong epidemiological evidence of a cluster or, if staff members, residents or other attendees of an institution belong to a group at increased risk of disease (see *People at increased risk of disease*), a public health response may be initiated prior to receiving results for a suspected cluster or outbreak.

Coordinating the provision of antibiotics for chemoprophylaxis, in a both confirmed and suspected institutional cluster other than in a healthcare facility, is the responsibility of PHUs. PHUs may engage the assistance of any clinicians working within an institution for provision and dissemination of antibiotics. Whilst the PHUs coordinate the overall contact management strategy, PHUs should liaise with staff health or infection control teams (where they exist).

Hospitals should take primary responsibility for implementing prevention and control measures for their facility, including identification of acquisition, and follow-up of staff, patients, and visitors. Depending on respective workloads and resources, PHUs may be able to assist hospitals with follow-up of patients discharged to the community.

In initiating a public health response to a cluster or outbreak, PHUs should:

- Consider convening an Outbreak Management team, including but not limited to infection control advisors, surveillance officers, epidemiologists, public health physicians, and any primary care providers for the facility and facility management staff.
- Identify contacts of cases and provide antibiotics for chemoprophylaxis, where:
    - a cluster or outbreak is confirmed via molecular typing, or is clear and strong

epidemiological evidence of transmission within the facility, all asymptomatic residents and staff should be offered antibiotics for chemoprophylaxis simultaneously.

    - linked cases have occurred within a subdivision of the facility and there is negligible crossover of residents and staff between subdivisions, antibiotics for chemoprophylaxis can be restricted to those within the affected subdivision.

- Review public health surveillance databases and information provided by facility management to establish if cluster cases are linked to other previously notified cases.
- Send isolates to reference laboratory for molecular typing.
- Consider communicating information about the cluster to local healthcare providers.

PHUs should engage institutional facility management to:

- Distribute appropriate fact sheets and education materials to staff and residents of the facility, and, in the case of childcare facilities, parents of attending children.
- Review cleaning, hygiene, and infection control practices, including the implementation of appropriate transmission-based precautions for cases and their carers or staff caring for the case in health or residential facilities.
- Establish enhanced surveillance of the facility for further linked cases. This period may vary but should be for at least 3 months after the most recent case was diagnosed. This should include educating facility management on symptoms and signs of iGAS infection and establishing a process by which facility management can notify the appropriate public health service.

Screening asymptomatic people for GAS carriage through testing is not routinely recommended but may be considered as part of a cluster investigation in an institutional setting depending on the risk factors for residents, staff, or attendees.

Restriction

Restriction of asymptomatic contacts and screening for GAS carriage is not routinely recommended, including in institutional settings. If a staff member working in an institutional setting has been screened and identified as a GAS carrier during a cluster investigation, the staff member should be excluded from work until 24 hours after initiation of appropriate and effective antibiotic treatment.

Other community clusters

Clustering of iGAS cases in community settings outside institutions and healthcare settings present distinct challenges for public health response. Community clusters can occur in a range of settings and contexts, including universities, sports clubs (where the sport involves close contact), among people who inject drugs (PWID) and among people experiencing homelessness (PEH).

Stigma, marginalisation, and criminalisation of injecting drug use and homelessness are a challenge to effective engagement with PWID and/or PEH. It is important to keep this in mind when responding to any increase in cases among this population.

Contacts within PEH and PWID populations who have open wounds or lesions are at higher risk for transmission. Contact tracing may be challenging among some PWID as individuals may not be willing to provide contact information for their peers. PHUs are encouraged to engage with any community services used by PWID and/or PEH cases to identify and provide appropriate treatment and information to contacts. This engagement also serves the purpose of determining whether a case has been linked to sheltered accommodation, a drug service or specific injecting network, prison setting, healthcare setting or other institution in the 7 days prior to onset of symptoms.

Where high-risk close contacts of cluster cases are identified in PWID of PEH populations (e.g., close contacts with chronic conditions, current open wounds or with whom the case has shared needles), liaise with community services to organise provision of antibiotics for chemoprophylaxis.

Elevated rates within the population with no cluster identified

Each state and territory should monitor rates of iGAS and compare against a relevant baseline to determine if iGAS rates are increasing. These rates may be different for different regions, and tolerable thresholds for increase may be lower for populations at increased risk of disease (see *People at increased risk of disease*). The baseline rates can be drawn from jurisdictional surveillance data or research (as per Section 2*: Disease occurrence and public health significance*). PHUs should, after considering available data, establish a threshold for increase from baseline rates appropriate for their population at which public health action should be triggered. If this threshold is met, the following actions should be considered by the PHU:

- Publishing a clinician's alert
- Releasing a media alert, with links to relevant fact sheets
- Other community messaging, with the aim to both inform and reassure
- Clinician education

All alerts and messaging should serve to both inform the public of the increase in rates but also to alleviate excess anxiety.

Aboriginal and Torres Strait Islander people

NSW specific iGAS guidance

Aboriginal people are considered a priority group for preventing Strep A infections and their sequelae (including iGAS).

NSW Health is committed to working in partnership with Aboriginal people and communities to improve the health outcomes of Aboriginal people as outlined in documents such as:

NSW Aboriginal Health Plan 2013-2023, NSW Aboriginal Health Partnership Agreement 2015 – 2025; and NSW Implementation Plan for Closing the Gap

Available Australian research studies and surveillance data have established that the rate of iGAS infections is higher in Aboriginal and Torres Strait Islander people than in the non-Indigenous population (see *Disease occurrence and public health significance*). Aboriginal and Torres Strait Islander people are at increased risk of iGAS transmission and severe outcomes due to a number of intersectional risk factors, including:

- Crowded and inadequate housing,
- Barriers to accessing appropriate and timely healthcare, including limited access to culturally appropriate healthcare, institutional racism, mistrust of mainstream health services and remoteness; and
- Community burden of disease, including higher rates of comorbid and immunocompromising diseases and conditions.

As such, a lower threshold, appropriate to the needs and circumstances of Aboriginal and Torres Strait Islander populations in each jurisdiction, should be used to initiate disease control measures if a cluster is suspected in an Aboriginal and/or Torres Strait Islander household, household-like setting, or community.

Household cases and clusters

For Aboriginal and Torres Strait Islander people, disease risk needs to be communicated in a culturally safe manner so individuals and families understand the recommended management plan and contribute to how this, and contact tracing, can be actioned appropriately.

Consider referring household and household-like contacts to their Aboriginal Community Controlled Health Service, Aboriginal Medical Service or local health providers for ongoing assessment and follow up if GAS symptoms develop for culturally appropriate follow-up. If iGAS symptoms develop in a household contact of a case, culturally appropriate medical attention should be sought immediately.

Culturally appropriate educational resources should be used where needed.

Community clusters

Further investigation should be undertaken by the local PHU if increases in notification numbers and/or rates are identified for a Aboriginal and/or Torres Strait Islander community. The trigger for investigation should be guided by the community size, composition, and underlying risk factors. The nature of any action will depend on a number of factors, including the size of the community.

Local Aboriginal Health Workers and Practitioners and local Aboriginal Community Controlled Health Organisations are key stakeholders and should be included in the development of community cluster responses.

NSW specific iGAS guidance

Environmental health and health education programs should be planned, developed, implemented and disseminated with Aboriginal peoples within a culturally appropriate governance structure, where Aboriginal people actively participate in decisions about public health strategies and actions.

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13. Appendices

Appendix 1: PHU Checklist for invasive Group A *Streptococcal* (iGAS) cases

Appendix 2: NSW iGAS information for close contacts

Appendix 3: List of normally sterile sites

Appendix 4: NSW iGAS information for parents/guardians/staff at a childcare facility

Appendix 5: NSW iGAS information for residential aged care facility

Appendix 1: PHU checklist for Invasive Group A *Streptococcal* cases (single case)

Confirm case:

- Assess information on case against case definition

Contact the patient's doctor to:

- Obtain patient's history
- Confirm results of relevant pathology tests
- Determine whether antibiotics have been provided to the case
- Confirm onset date and symptoms of the illness (if possible)
- Identify any known likely source of infection, including possible acquisition in a hospital or care facility

Provide information to patient's doctor, case, or contacts:

- Recommend exclusions and restrictions
- Identify contacts and assess risk of iGAS transmission. Determine whether contact is eligible for antibiotics for chemoprophylaxis and arrange, where applicable, and advise that medical attention be sought if not already obtained for any contacts with current symptoms.
- Provide with appropriate iGAS Fact Sheet for case and contacts

Other actions:

- Enter case data onto notifiable diseases database
- For a death, report details to state/territory communicable disease agency
- Where defined groups of people have been exposed (e.g., residential aged care, childcare), provide facility management with fact sheets for circulation to staff, and residents and, in the case of childcare or schools, for parents or guardians of attendee children.

Appendix 2: NSW iGAS information for close contacts

(This content of this sheet can be adapted for different settings and audiences)

You have recently been in close contact with a person with invasive group A streptococcal disease (iGAS).

- iGAS is caused by an infection with group A *Streptococcus* (GAS), a type of bacteria often found in the throat and on the skin.
- Although your risk of developing iGAS is low, it is important that you are aware of symptoms to look out for.
- Seek medical attention urgently if you have or develop symptoms

What is Group A Streptococcus (GAS)?
Group A *Streptococcus* (GAS) bacteria – also known as *Streptococcus pyogenes* – are commonly found in the throat and on the skin. People can carry GAS bacteria and have no symptoms of illness or they may develop an infection. GAS infections are usually mild infections of the throat or skin, such as 'strep throat' and 'impetigo' or 'school sores'.

How is GAS spread?
GAS bacteria are usually spread between people through coughing, sneezing, kissing, or direct skin to skin contact. People who carry GAS bacteria without any symptoms and people who are unwell with a GAS infection can both pass the bacteria on to others.

What is invasive group A streptococcal (iGAS) disease?
iGAS disease occurs when GAS bacteria get into parts of the body where they are not usually found such as the blood, joints, lining of the brain, or the birth canal after childbirth.

Although iGAS is uncommon, it can be a serious disease and can develop very quickly requiring immediate medical attention.

Who is at risk of iGAS?
Most people who have contact with a person with iGAS remain well and symptom-free. There is some evidence that close contacts of a person with iGAS (e.g. household members, sexual partners, childcare attendees and aged care facility residents) are at higher risk, particularly within 30 days of contact with a person with iGAS. Close contact means a person who had prolonged close contact with a case in a household or household-like setting during the 7 days before diagnosis of iGAS in the case.

While iGAS disease can affect anyone, children less than 5 years old, older people (particularly people aged over 75), Aboriginal and Torres Strait Islander people and people with chronic or immunocompromising conditions may be at higher risk.

Do close contacts of a person with iGAS require treatment?
Contacts of a person with iGAS do not usually require any treatment if they remain well. Antibiotics may be considered for contacts in some circumstances. If a newborn baby or their mother has iGAS, the other should also be given antibiotics to prevent the disease.

What are the symptoms of iGAS?
Symptoms of iGAS depend on which part of the body is infected, and include:

- Fevers
- Unusual tiredness
- Chills and/or sweats
- Dizziness
- Shortness of breath and/or chest pain
- Headache and/or stiff neck
- Nausea and vomiting
- Red, warm, painful, and rapidly spreading skin infection which may have pus or ulceration.

What do I do if I develop any of these symptoms?
A person with iGAS can become very sick within 12 – 24 hours. It is important to seek medical advice immediately if you or someone in your household develops symptoms. Tell the doctor you are a close contact of someone with iGAS and take this letter with you.

If you develop mild symptoms such as a sore throat or minor skin infection without any of the symptoms of iGAS above, see your GP, who can arrange testing and treatment if they think this is required.

If you can't contact your doctor, use the online Service Finder to find one near you, or call healthdirect on 1800 022 222 (free and available 24 hours a day, 7 days a week).

How is iGAS prevented?
Regularly washing your hands with soap and water or using an alcohol-based hand rub can help reduce the risk of spreading GAS bacteria. Open wounds should be kept covered with a clean, dry bandage or dressing until they are healed. After changing a dressing, discard used dressings or band aids in the bin and wash your hands.

More information
The following websites can provide further information:

NSW Health – Invasive group A streptococcus fact sheet
https://www.health.nsw.gov.au/Infectious/factsheets/Pages/Invasive-group-A-streptococcus.aspx

Healthdirect – Group A Streptococcal Disease
https://www.healthdirect.gov.au/group-a-streptococcal

Appendix 3: List of normally sterile sites

Normally sterile sites include, but are not limited to:

- Blood
- Cerebrospinal fluid
- Pleural fluid
- Peritoneal fluid
- Pericardial fluid
- Joint fluid
- Bone including bone marrow
- Internal organs; specimen obtained from surgery or aspirate from one of the following:
    - Lymph node
    - Brain
    - Heart
    - Liver
    - Spleen
    - Vitreous fluid
    - Kidney
    - Pancreas
    - Ovary
    - Vascular tissue

To meet the confirmed case definition, the growth of GAS represents invasion into the normally sterile site and not contiguous spread related to tissue degeneration (such as a deep diabetic ulcer leading to adjacent bone infection).

Lung tissue is not a normally sterile site.

The following clinical presentations are **not** considered sufficient to meet the probable case definition:

- An abscess that forms above the fascial plane (e.g., peritonsillar abscess, parapharyngeal abscess).

Interpretation of post-mortem specimens from usually sterile sites should be interpreted with caution, preferably in conjunction with a pathologist and/or clinical microbiologist.

Appendix 4: NSW iGAS information for parents/guardians/staff at a childcare facility

XX MONTH 20XX

- iGAS is caused by infection with group A *Streptococcus* (GAS), a type of bacteria often found in the throat and on the skin.
- Although the risk of developing iGAS is low, it is important that you are aware of symptoms to look out for.
- Seek medical attention urgently if your child has or develops symptoms.

Dear Parent or Guardian,

Someone who spent time in **[name of class and facility]** has been diagnosed with invasive group A streptococcal disease (iGAS). Your child may have had close contact with this person. We request that you monitor your child for symptoms of iGAS for the next 30 days (until XX/XX/202X). There is no need to keep your child at home if they are well. Please see below for important information on iGAS.

What is group A Streptococcus (GAS)?
Group A *Streptococcus* (GAS) bacteria – also known as *Streptococcus pyogenes* – are commonly found in the throat and on the skin. People can carry GAS bacteria and have no symptoms of illness, or they may develop an infection. GAS infections are usually mild infections of the throat or skin, such as 'strep throat' and 'impetigo' or 'school sores'.

How is GAS spread?
GAS bacteria are usually spread between people through coughing, sneezing, kissing, or direct skin to skin contact. People who carry GAS bacteria without any symptoms and people who are unwell with a GAS infection can both pass the bacteria on to others.

What is invasive group A streptococcal (iGAS) disease?
iGAS disease occurs when GAS bacteria get into parts of the body where they are not usually found such as the blood, joints, or lining of the brain.

Although iGAS is uncommon, it can be a serious disease and can develop very quickly requiring immediate clinical attention.

Who is at risk of iGAS?
Most people who have contact with a person with iGAS remain well and symptom-free. There is some evidence that close contacts of a person with iGAS (including childcare attendees) are at higher risk, particularly within 30 days of contact with a person with iGAS.

While iGAS disease can affect anyone, children less than 5 years old, older people (particularly people aged over 75), Aboriginal and Torres Strait Islander people and people with chronic or immunocompromising conditions may be at higher risk.

Do contacts of a person with iGAS require treatment?
Contacts of a person with iGAS do not usually require any treatment if they remain well. However, if concerned, please contact your doctor.

What are the symptoms of iGAS?
Symptoms of iGAS depend on which part of the body is infected, and include:

- Fevers
- Unusual tiredness
- Chills and/or sweats
- Dizziness
- Shortness of breath and/or chest pain
- Headache and/or stiff neck
- Nausea and vomiting
- Red, warm, painful, and rapidly spreading skin infection which may have pus or ulceration.

What do I do if my child develops any of these symptoms?
A person with iGAS can become very sick within 12 – 24 hours. It is important to seek medical advice immediately if your child or someone in your household develops symptoms. Tell the doctor that your child is a close contact of someone with iGAS and take this letter with you.

If your child develops mild symptoms such as a sore throat or minor skin infection without any of the symptoms of iGAS above, see your GP, who can arrange testing and treatment if they think this is required. Please also let your childcare centre know.

If you can't contact your doctor, use the online Service Finder to find one near you, or call healthdirect on 1800 022 222 (free and available 24 hours a day, 7 days a week).

How is iGAS prevented?
Regularly washing your hands with soap and water or using an alcohol-based hand rub can help reduce the risk of spreading GAS bacteria. Open wounds should be kept covered with a clean, dry bandage or dressing until they are healed. After changing a dressing discard used dressings or band aids in the bin and wash your hands.

For more information, please see the attached NSW Health iGAS Fact Sheet, or Healthdirect - Group A Streptococcal Disease, or Sydney Children's Hospital iGAS Fact Sheet
You can also call the Public Health Unit on <phone>

Yours sincerely

Director, Public Health Unit

Appendix 5: NSW iGAS information for residential aged care facility

XX MONTH 20XX

- iGAS is caused by an infection with group A *Streptococcus* (GAS), a type of bacteria often found in the throat and on the skin.
- Although the risk of developing iGAS is low, it is important that residents/ staff are aware of symptoms to look out for.
- Seek medical attention urgently if any residents have or develop symptoms.

Dear Manager,

A resident/residents/staff from the **wing/level** of **[RACF name] has/have** been diagnosed with invasive group A streptococcal disease (iGAS). We request that you closely monitor for symptoms of iGAS in other residents who share the **wing/level** for the next 30 days (until XX/XX/202X). There is no need to isolate the residents if they are well. Please see below for important information on iGAS.

What is group A Streptococcus (GAS)?
Group A *Streptococcus* (GAS) bacteria – also known as *Streptococcus pyogenes* – are commonly found in the throat and on the skin. People can carry GAS bacteria and have no symptoms of illness or they may develop an infection. GAS infections are usually mild infections of the throat or skin, such as 'strep throat' and 'impetigo' or 'school sores'.

How is GAS spread?
GAS bacteria are usually spread between people through coughing, sneezing, kissing, or direct skin to skin contact. People who carry GAS bacteria without any symptoms and people who are unwell with a GAS infection can both pass the bacteria on to others.

What is invasive group A streptococcal (iGAS) disease?
iGAS disease occurs when GAS bacteria get into parts of the body where they are not usually found such as the blood, joints, or lining of the brain.

Although iGAS is uncommon, it can be a serious disease and can develop very quickly requiring immediate medical attention.

Who is at risk of iGAS?
Most people who have contact with a person with iGAS remain well and symptom-free. There is some evidence that close contacts of a person with iGAS including aged care facility residents are at higher risk, particularly within 30 days of contact with a person with iGAS. Close contact means a person who had prolonged close contact with a case in a household or household-like setting during the 7 days before diagnosis of iGAS in the case.

While iGAS disease can affect anyone, older people (particularly people aged over 75 years), Aboriginal and Torres Strait Islander people and people with chronic or immunocompromising conditions may be at higher risk.

Do contacts of a person with iGAS require treatment?
Contacts of a person with iGAS do not usually require any treatment if they remain well. Antibiotics may be considered for contacts in some circumstances. The public health unit can advise if this is required for residents at your facility.

What are the symptoms of iGAS?
Symptoms of iGAS depend on which part of the body is infected, and include:

- Fevers
- Unusual tiredness
- Chills and/or sweats
- Dizziness
- Shortness of breath and/or chest pain
- Headache and/or stiff neck
- Nausea and vomiting
- Red, warm, painful, and rapidly spreading skin infection which may have pus or ulceration.

What do we do if a resident develops iGAS symptoms?
A person with iGAS can become very sick within 12 – 24 hours. It is important to seek medical advice immediately if any resident in the affected **wing/level** develops iGAS symptoms. Please arrange for a clinical review by a doctor as soon as possible and tell the doctor that the resident is a close contact of someone with iGAS. The doctor can advise whether iGAS is likely and arrange for early treatment if needed.

If a resident develops mild symptoms such as a sore throat or minor skin infection without any of the symptoms of iGAS above, arrange for a clinical review with their local doctor, who can arrange testing and treatment if they think this is required. Please also advise the public health unit of any residents who develop symptoms.

What happens if a resident is confirmed to have iGAS?
If a resident is diagnosed with iGAS they will need to be kept isolated using standard and droplet transmission-based precautions until they have completed 24 hours of appropriate antibiotics.

How is iGAS prevented?
Practicing good hand hygiene (e.g. regularly washing your hands with soap and water or using an alcohol-based hand rub) can help reduce the risk of spreading GAS bacteria. Open wounds should be kept covered with a clean, dry bandage or dressing until they are healed. Discard used tapes, dressings or band aids immediately in the bin.

For more information, please see the attached NSW Health iGAS Fact Sheet, or Healthdirect – Group A Streptococcal Disease or call the Public Health Unit on <phone>.

Yours sincerely

Director, Public Health Unit