1 Introduction

1.1 Purpose

This guideline is for the public health management of contacts of invasive Group A Streptococcus (iGAS) infection in Ireland. It describes how contacts of iGAS infection should be managed in: Household settings; crèche, school and other childcare settings; residential care facility settings (RCFs); and other congregate community settings.

This guideline has been adapted from the *2023 UKHSA Guidelines for the Management of Contacts of Invasive Group A Streptococcus (iGAS) in Community Settings* (1). It replaces the *Management of Invasive Group A Streptococcal Infections in Ireland 2006* (2). This guideline review was undertaken by a multidisciplinary guideline development group convened by HSE Public Health: National Health Protection Office in 2023 following an upsurge in incidence of iGAS infections in Ireland in 2022/2023 (please see Appendix 3 for membership). This guideline has been externally reviewed by the iGAS Incident Management Team (IMT) and Area Directors of Public Health (ADPHs) in Ireland.

This guideline should be considered in conjunction with the HSE Public Health: National Health Protection Office guidance and algorithms for the public health management of iGAS:

- Management of invasive group A streptococcal infection (iGAS) for Emergency Medicine Physicians
- Guidance for General Practitioners and others on the management of infections caused by Group A Streptococcus
- Management of invasive and non-invasive Group A Streptococcal infection for mothers and neonates within 28 days of delivery
- Choice of agent for treatment of Group A Streptococcus (GAS) or chemoprophylaxis for a contact of invasive Group A Streptococcus (iGAS)
- Algorithm 1: Management of contacts of a case of iGAS in a household setting
- Algorithm 2: Management of iGAS case linked to a crèche, school or other childcare setting

- Algorithm 3: Identification of suspected or confirmed iGAS outbreak in an acute hospital or maternity setting
- Algorithm 4: Management of a single case of iGAS in an acute hospital or maternity setting
- Algorithm 5: Management of a single case of iGAS infection in a Residential Care Facility
- Algorithm 6: Identification and management of suspected or confirmed iGAS outbreak in a Residential Care Facility

1.2 Methodology

A literature search of available evidence was undertaken in 2023 and was considered alongside the 2023 *UKHSA Guidelines for the Management of Contacts of Invasive Group A Streptococcus (iGAS) in Community Settings* and Irish national surveillance data. The quality of evidence within the UKHSA guideline was graded according to SIGN guidelines (3) (Appendix 1). The guideline development group reviewed UKHSA evidence tables and agreed with the SIGN-GRADE judgements provided by UKHSA.

Where it was necessary to contextualise evidence, for example, where the context plays an essential role and therefore needs to be considered, agreement on best practice was reached through consensus among guideline development group members.

1.3 Future updates

A review of this guideline may be addressed three years after publication when the Research and Guideline Development Unit (RGDU) next considers updating this guideline. The RGDU may undertake a more rapid update of specific chapters within this guideline if new and relevant evidence is published.

1.4 Disclosure statement and funding

The guideline development group members were asked to declare potential conflicts of interest at the time of appointment. No conflicts of interest were declared. The RGDU was commissioned by the HSE Public Health: National Health Protection Office to undertake the work on this guideline. No funding was received for the development of this guideline.

1.5 Strengths and limitations

This guideline was adapted from the UKHSA guidelines. The RGDU reviewed the judgement of UKHSA on the appraisal and relevance of the evidence base informing these guidelines. Experts from across the Irish health system were invited to review the content and group consensus was applied to determine the final recommendations. Consensus-based methods can assist in the process of drawing conclusions and developing recommendations. The RGDU acknowledge that there may be limitations in developing rapid guidelines.

1.6 Definitions of terminology

1.6.1 Case definitions

Table 1 below outlines the case definitions for iGAS, current as of January 2024.

Table 1 Surveillance case definitions

Criteria	Definition
Clinical criteria	Clinical systemic presentation consistent with iGAS or severe GAS[2] infection necessitating hospitalisation including: • Streptococcal toxic shock syndrome (STSS) • Necrotising fasciitis • Pneumonia • Septic arthritis • Meningitis • Peritonitis

[2] GAS refers to *Streptococcus pyogenes*, not *S. dysgalactiae* or any other streptococcal lineage which carries the group A antigen.

	• Osteomyelitis • Myositis • Puerperal sepsis • Severe cellulitis
Laboratory criteria	1. Isolation of group A streptococcus (GAS), **by culture or molecular methods** (such as PCR), from a normally sterile body site (blood, cerebrospinal fluid, pleural-peritoneal-pericardial fluids, joint aspirate, bone, or deep tissue or abscess at operation or post-mortem) 2. Isolation of GAS from a non-sterile site (for example: Throat, sputum, vagina)
Epidemiological criteria	Suspected case has an epidemiological link to a confirmed case of iGAS
Case classification	1. **Confirmed case** • Any person meeting the laboratory criteria of 1 above **OR** • Any person meeting the laboratory criteria of 2 above PLUS the clinical criteria described above 2. **Probable case** • Any person meeting the clinical criteria above PLUS ○ the epidemiological criteria above **OR** ○ the clinician considers that GAS is the most likely cause

1.6.2 Other terminology and definitions

a) iGAS diagnosis date

The date at which invasive disease was diagnosed. For confirmed iGAS cases, the diagnosis date is the date that the specimen used to diagnose iGAS infection was taken. Where iGAS is confirmed post-mortem, use the date of onset for severe clinical presentation. For probable

cases (no microbiological confirmation), use hospital admission date where available, otherwise use date of onset for severe clinical presentation.

b) Close contact

This is defined as those who have had prolonged close contact with the case in a household-type setting during the 7 days before diagnosis of illness and up to 24 hours after initiation of appropriate antimicrobial therapy in the index case.

Examples of such contacts would be (4):

- Those living and/or sleeping in the same household, (including extended household if the case has stayed at another household)
- Pupils in the same dormitory
- Intimate partners
- University students sharing a kitchen in a hall of residence accommodation (4).
- Contacts who provide nursing care (public health nurses, carers).

Close contacts would <u>not</u> normally include (SIGN grading C):

- Staff and children attending the same school, class, or tutor group (although the risk assessment may allow you to define a group within the setting in which extensive close contact takes place)
- Work colleagues
- Care home residents (unless sharing a bedroom)
- Friends (not co-habiting)
- Low-level saliva contact, for example, social kissing (cheek)
- Sharing food or drink with the case
- Attending the same social function
- Travelling in the same plane, bus, or train, unless for prolonged periods of time and within two rows (for example, a flight ≥8 hours, coach tours over a period of days) (5)

For a residential care facility (RCF), residents are **not** usually classified as close contacts unless they share a bedroom. For crèches, schools, and other childcare settings please see Chapter 4.

In other settings such as congregate settings, settings where individuals co-habit, crèches, schools or other childcare settings, acute hospitals, high risk close contacts may be identified through a Public Health Risk Assessment (PHRA).

c) High risk close contact

- Older persons (≥75 years)
- Pregnant women ≥37 weeks gestation
- Women within 28 days of giving birth
- Neonates (up to 28 days old)
- Individuals who develop chickenpox with active lesions within the time period of 7 days prior to diagnosis in the iGAS case or within 48 hours after commencing antibiotics by the iGAS case, if exposure ongoing. Elements of PHRA should be considered.

d) Older person

A person aged 75 years and above.

e) Residential Care Facility (RCF)

A Residential Care Facility (RCF) is any long-term facility for the nursing or social care of its residents. This includes nursing homes caring for older persons and younger adults and children with mental or physical disabilities.

f) iGAS Outbreak

An outbreak is defined as two or more cases of probable or confirmed iGAS infection related by person, place, and time. Cases will usually be within a month of each other, but interval may extend for several months. For outbreak closure, a conservative approach of 60 days since last iGAS case (2 x 30-day period) should be considered. A single case of iGAS infection with one or more cases of non-invasive Group A Streptococcus (GAS) infection, although not considered an outbreak, may still warrant investigation and ongoing management taking into

consideration time interval, number of cases, and epidemiological links.

Table 2 List of definitions

Term	Definition
Incubation period	The period between exposure to an infectious agent and the development of symptoms or signs of illness
Infectious period	The period during which the case is contagious and can transmit disease
Prophylaxis window	The ideal period of time during which prophylactic treatment should be initiated

1.7 Epidemiology of iGAS disease

Since the 1980s GAS infections have been increasing globally. In particular, iGAS infections have increased markedly since 2010. Genetic changes in circulating strains, along with changes in host susceptibility, can result in dramatic upsurges in disease. GAS can occasionally colonise the throat, skin, and vagina of healthy humans. GAS can cause a range of diseases, from non-invasive manifestations such as pharyngitis, impetigo, and scarlet fever to life-threatening invasive disease, such as GAS bacteraemia, necrotising fasciitis, or streptococcal toxic shock syndrome (6). Cases of iGAS infection primarily occur sporadically, although outbreaks do arise, particularly in institutional care settings (7).

Notifications of iGAS typically peak in the first 6 months of the year, however an unseasonal and severe upsurge occurred in Ireland in the final quarter of 2022 and during the first half of 2023 (8). This resulted in iGAS notifications being 4.5 times higher than expected. Children were disproportionately affected. During the pre-pandemic period, paediatric cases would normally constitute one quarter of iGAS cases; during this upsurge, paediatric cases comprised 40% of all cases. Twelve paediatric deaths occurred during this period, a marked increase on the pre-pandemic period. The upsurge in iGAS was closely associated with increases in common respiratory viruses (influenza, COVID-19, and RSV) during the winter period in all age groups, and with varicella infection during the spring-summer period in children. This upsurge was characterised by a markedly increased proportion of isolates expressing *emm*1 and *emm*12 genes, which are associated with more severe disease (8).

Asymptomatic throat carriage rates in the healthy adult population are reported to be low, around 2% in high-income countries (9). Carriage of GAS is higher in children compared to adults (10-12) with one particular systematic review and meta-analysis reporting a carriage prevalence of 10.5% in asymptomatic children (9). In a school outbreak transmission study asymptomatic throat carriage of the S. *pyogenes* outbreak strain was found in 9.6%, 26.9% and 24.1% of children in weeks 1, 2 and 3 respectively post outbreak onset; carriage of non-outbreak strains was 2.8% during the study (13). Vaginal GAS carriage is low, with figures of 0.03% to 0.37% reported from research studies and laboratory surveillance (14-18).

Around 90% of iGAS cases occur in the community (19-21) with elevated risk observed for residents in Residential Care Facilities (RCF) and older people (22, 23). Other groups considered to be particularly at risk of iGAS infection are people with co-morbidities such as diabetes, cardiovascular disease, conditions, or treatments affecting immunity, influenza or recent chickenpox, neonates and post-partum women in the neonatal period, and people who are homeless or inject drugs (7).

Information on the epidemiology of iGAS at the time of publishing can be found on the HPSC website at the link here.

1.8 Legal obligation to notify cases of iGAS infection

iGAS is a notifiable disease under the Infectious Diseases Regulations 1981 (24). Under Section 14 of these regulations, as amended by S.I. No. 707 of 2003, a medical practitioner or a clinical director of a diagnostic laboratory, on suspecting or identifying a case of the infection, is obliged to notify cases to the Director of Public Health/Medical Officer of Health for the area of residence of the patient. All iGAS cases are classified as urgent and should be notified by telephone promptly to facilitate urgent public health actions. iGAS is not currently a notifiable disease in Northern Ireland (25).

1.9 Microbiological characterisation of iGAS isolates

Isolates from patients with iGAS infection should be retained for 6 months and sent directly to the Irish Meningitis & Sepsis Reference Laboratory (IMSRL) for typing. Epidemiological investigations and preventative measures should not await results of typing.

Currently, *emm* typing remains the molecular gold standard for typing GAS and more than 200 *emm* types have been described globally (26). However, further sub-typing or single-nucleotide polymorphism from whole genome sequencing (WGS) may be required to identify, or more clearly define, a potential outbreak as well as for monitoring during the management and investigation of an outbreak.

At present WGS is not routinely used during outbreak investigations in the UK but it has been used during a number of outbreaks in care homes (27, 28) hospital and maternity settings (29, 30) outbreaks among people who inject drugs or experience homelessness (31) and outbreaks associated with community health services delivered at home (32). The high discriminatory power of WGS has been useful to: (i) confirm that epidemiologically linked cases form a cluster, including those where a long interval exists between cases, (ii) exclude epidemiologically linked cases of the same *emm* type from further investigation if they did not cluster with the other cases (32, 33).

There are some general associations between *emm* types and particular clinical presentations, both in broad terms (skin/soft-tissue vs respiratory), and in relation to more specific presentations such as puerperal sepsis (*emm*28) (34, 35). However, *S. pyogenes* is a versatile pathogen and specific strains can cause an array of clinical presentations of varying severity (36, 37). Teams investigating outbreaks should be vigilant for a range of possible clinical manifestations. Whilst there is some evidence indicating excess risk of death for specific *emm* types, namely *emm*3 and *emm*1, all strains should be regarded as having the potential to cause life-threatening infection (38).

For the full reference list scan the QR code below: