

# IgG Subclasses

## Synonyms

## Clinical Indication

**IgG1** comprises 60-70% of total IgG (deficiency often result in hypogammaglobinaemia) and contributes to the antibody response to protein and viral antigens

**IgG2** comprises 20-30% of total IgG and contributes to the antibody response to bacterial polysaccharide capsular antigens (e.g. streptococcus pneumoniae)

**IgG3** comprises 5-8% of total IgG and, similar to IgG1, contributes to the antibody response to protein and viral antigens (infections with Moraxella catarrhalis and S. pyogenes are typical)

**IgG4** comprises 1-4% of total IgG and its biologic role is incompletely understood. It is thought to play a role in the response to parasitic disease. Deficiency is common in the general population and the majority of people are asymptomatic. IgG4 related disease is a rare systemic immune mediated disorder and is characterised by tumour-like swelling of involved organs, elevated IgG4 levels (in 60-70% of patients), infiltrations of IgG4 positive plasma cells in the affected tissue and fibrosis. One of the more common IgG4 related diseases studied is type 1 autoimmune pancreatitis.

Decreased levels of IgG subclasses are seen in the normal population but can also be associated with increased frequency and severity of infections (from pathogens the deficient subclass contributes an antibody response against).

Serum IgG4 levels are not sensitive or specific for the diagnosis of IgG4 related disease. Patients may have IgG4-RD disease and normal IgG4 levels and IgG4 may be raised in other conditions with a similar presentation. The diagnosis of IgG4-RD requires the identification of characteristic findings upon biopsy of affected tissue.

## Part of Profile / See Also

IgG1, IgG2, IgG3 and IgG4

## Request Form

Combined Pathology manual Blood form or ICE request

## Availability / Frequency of Analysis

Referred test: Analysed by Protein Reference Unit, St Georges ([9745](#)), if specific criteria met.

## Turnaround Time

Two weeks

## Patient Preparation

## Sample Requirements

### Specimen Type

Serum

### Volume

2 ml

### Container



Yellow top (SST) tube.



Paediatric SST tube (yellow top BD Microtainer tube)



Paediatric lithium heparin (orange top Sarstedt)

### Reference Range & Units

Age	IgG1 (g/L)	IgG2 (g/L)	IgG3 (g/L)	IgG4 (g/L)
0 - 6 months	1.5 - 3.0	0.3 - 0.5	0.1 - 0.6	< 0.5
6 - 24 months	2.3 - 5.8	0.3 - 3.9	0.1 - 0.8	< 0.5
2 - 5 years	2.3 - 6.4	0.7 - 4.5	0.1 - 1.1	< 0.8
5 - 10 years	3.6 - 7.3	1.4 - 4.5	0.3 - 1.1	< 1.0
10 - 15 years	3.8 - 7.7	1.3 - 4.6	0.2 - 1.2	< 1.1
Over 15 years	3.2 - 10.2	1.2 - 6.6	0.2 - 1.9	< 1.3

### Interferences

### Interpretation & Clinical

### Decision Value (if applicable)

The diagnosis of a clinically significant IgG subclass deficiency requires all three of the below:

- Clinical history of recurrent sinopulmonary infections
- Deficiency of one or more IgG subclass (generally levels less than 2SD below age specific mean in the presence of normal/near normal total IgG)
- Demonstration of an inadequate antibody response, typically to polysaccharide vaccine challenge

It is important to note that normal total IgG and subclass IgG levels do not exclude significant humoral immunodeficiency. Individuals can have normal levels of immunoglobulins but still be unable to mount an adequate immune response to an invading pathogen. Patients can have low or absent IgG subclasses but normal total immunoglobulin concentrations.

Low IgG1 can be seen in primary or secondary immunodeficiency but often does not occur in isolation. Low IgG2 concentration may be observed in individuals susceptible to bacterial infections. The clinical significance of low/absent IgG3 and IgG4 is uncertain.

### References

Up to Date – IgG subclasses: Physical properties, genetics and biologic functions and IgG subclass deficiency – searched Sept 2018.

Up to Date – Diagnosis and differential diagnosis of IgG4-related disease – searched November 2020

### Test code

SIGS

### Lab Handling

Aliquot at least 500ul and store in referrals rack at 4C. Sent daily by courier to St Georges Hospital, London.

