Immunoglobulin (Privigen) intravenous for adults

Who can administer

May be administered by registered competent doctor or nurse/midwife

Important information

- Use Online Dosage Calculator and Order Form- (only accessible via HSE computer (GUH useful resources- Pharmacy Medicines Information)
- For haematology and oncology patients please provide patient information leaflet BEFORE first-dose
- See overleaf for monitoring requirements
- This is a **blood product**, therefore batch and expiry information should be recorded in the patient's notes. This is facilitated by putting the dispensing label from each vial into the patient's notes
- Licensed doses vary with the brand of immunoglobulin employed. Discuss with your consultant or pharmacy if further information required
- **Contraindicated** in individuals with known **class specific antibody to Immunoglobulin A;** patients with hyperprolinaemia
- **Thromboembolism:** Use caution with IVIg in **obese patients** and in patients with **pre-existing risk factors for thrombotic events**. In patients at risk for thromboembolic adverse reactions, IVIg products should be administered at the **minimum rate of infusion and dose practicable**
- **Glass bottle precautions as follows:**
- Precautions need to be taken during administration to **prevent possible air embolism** - particularly in central line administration.
- Bottles **must be vented** in one of two ways - Directly by means of a filter needle into the bottle which goes through the rubber stopper and opens into the air, or Direct air vent on the air inlet of the administration set, located between the drip chamber and piercing pin, it is covered with a bacterial retentive filter to reduce the chance of contamination

Available preparations

Privigen human normal Immunoglobulin 2.5g per 25mL vial

Privigen human normal Immunoglobulin 5g per 50mL vial

Privigen human normal Immunoglobulin 10g per 100mL vial

Privigen human normal Immunoglobulin 20g per 200mL vial

Privigen human normal Immunoglobulin 40g per 400mL vial

Reconstitution

Already in solution

Infusion fluids

Not required (product ready for infusion)

Methods of intravenous administration

Intermittent intravenous infusion (using an electronically controlled infusion device)

- **Initial rate:** 0.3ml per kg per hour for 30 minutes
- If well tolerated, the rate of administration may be gradually increased to a maximum of 4.8ml/kg/hour
- Clinical data obtained from a limited number of patients also indicate that adult patients with Primary Immunodeficiency Syndromes may tolerate a rate of up to 7.2ml/kg/hour
- If reaction occurs during infusion, see 'Further information' for guidance
- When prescribed as a daily dose over several days, the rate will need to be titrated again on each day. However, if it was well tolerated the previous day, the rate may be increased more quickly on subsequent days. [ref 1]
- If prescribed as a daily dose, and on day one it is first administered late in the day, on subsequent days the starting time for administration may be brought back to earlier in the day if required. Gradual titration of the rate will be needed on each day, as before.

Infusion rates for PRIVIGEN- sample calculations. See above for exceptions to rate increases

If a patient's weight falls between two values below, use the lower infusion rate- e.g. patient weight 59kg- use rates for 55kg rather than for 60kg

Increase rate as per table below, every 30 minutes as tolerated - <u>until the full dose has been administered</u>

Maintain low rate of infusion throughout if patient has acute renal disease, or thromboembolic disorders

Weight (kg)	First 30 minutes (ml/hour)	Second 30 minutes (ml/hour)	Third 30 minutes (ml/hour)	Fourth 30 minutes (ml/hour)	Maximum rate (ml/hour)
	0.3ml/kg/hour	0.6ml/kg/hour	1.2ml/kg/hour	2.4ml/kg/hour	4.8ml/kg/hour
50	15	30	60	120	240
55	16.5	33	66	132	264
60	18	36	72	144	288
65	19.5	39	78	156	312
70	21	42	84	168	336
75	22.5	45	90	180	360
80	24	48	96	192	384
85	25.5	51	102	204	408
90	27	54	108	216	432
95	28.5	57	114	228	456

100 (max weight to use for RATE calculations*)	**30**	**60**	**120**	**240**	**480**

Rates above are for most patients. Patients with Primary immunodeficiency may tolerate up to 7.2ml/kg/hour
*** max 100kg used to calculate dose RATE** - based on requirement not to overload heavy patients with high rate of large volume infusions

Dose in adults

Important points [ref 2]

- Use Online Dosage Calculator and Order Form
- Using this adjusted weight dose may contribute to minimisation of side-effects and will also save significant quantities of immunoglobulin.

Measles prophylaxis[ref 3] (see NIAC Immunisation Guidelines, Chapter 12, Measles)

- Give 0.4g per kg stat
- For example 0.4g per kg for patient who weighs 65Kg is 26g - give 25g (2x10g vials + 5g vial)
- If there is significant ongoing or re-exposure to measles following the administration of IVIG, the administration should be repeated at three weekly intervals

Replacement therapy in primary immunodeficiency syndromes

- 0.4 to 0.8g per kg as starting dose, followed by 0.2 to 0.8g per kg every three to four weeks
- Three to six months are required after the initiation of therapy for steady-state IgG levels to occur
- Desired trough levels (taken before the next infusion) are at least 6g/L

Replacement therapy in secondary immunodeficiency

- Usual dose 0.2 to 0.4g per kg every three to four weeks
- IgG trough levels should be measured and assessed in conjunction with the incidence of infection.
- Dose should be adjusted as necessary to achieve optimal protection against infections, an increase may be necessary in patients with persisting infection; a dose decrease can be considered when the patient remains infection free.

Primary immune thrombocytopenia

- **Treatment**: either 0.8g to 1g per kg on day one, which may be repeated once within three days,
- **or** 0.4g/kg daily for two to five days
- Treatment may be repeated if relapse occurs

Guillain Barre syndrome

- 0.4g per kg daily for five days
- possible repeat of dosing in case of relapse

Chronic Inflammatory Demyelinating Polyneuropathy (CIDP)

- **Starting dose:** Give 2g/kg given over two to five days .(example 1g/kg daily for two days, or 0.4g/kg daily for five days)
- **Maintenance dose:** Give 1g/kg given over one to two days, every three weeks

Multifocal Motor Neuropathy (MMN)

- **Starting dose:** Give 2g/kg given over two to five days (example 1g/kg daily for two days, or 0.4g/kg daily for five days)
- **Maintenance dose:** Give 1g/kg every two to four weeks, **or** 2g/kg every four to eight weeks over 2 to 5 days
- Treatment effect should be evaluated after each cycle. If no response after six months, then treatment should be discontinued

See SPC or Australian guidelines for other indications

Monitoring

- Patients must be **closely monitored** and carefully observed for any adverse reactions throughout the infusion period and for at least **20 minutes** after administration
- Monitoring should be **extended to 60 minutes** for immunoglobulin naive patients, those switched from another product, or when there has been a long interval since previous infusion
- **Certain adverse reactions** (e.g. headache, flushing, chills, myalgia, wheezing, tachycardia, lower back pain, nausea, and hypotension) **may be related to the rate of infusion**
- If adverse reactions occur, slow or stop the infusion - see under 'Further information'. Please also consult Medication Protocol: Management of Infusion Related patient reactions in nurse led infusion settings in GUH -available on Q pulse (CLN-NM-0118)
- Ensure the following when administering IVIG
    - adequate hydration prior to the initiation of the infusion of IVIg
    - monitoring of urine output
    - monitoring of serum creatinine levels
    - monitoring for signs and symptoms of thrombosis
    - assessment of blood viscosity in patients at risk for hyperviscosity
    - avoidance of concomitant use of loop diuretics

Further information

- **Management of infusion related reactions:** depending on the severity of the reactions, the infusion rate may either be **slowed or stopped**
- Some cases of **acute renal failure** have been reported in patients receiving IVIG
    - This is particularly those containing sucrose as an excipient (Privigen does not contain sucrose)
    - administer at the minimum rate of infusion and dose practicable for patients at risk for acute renal failure
- **Adequate hydration prior to infusion** of IVIG is essential, urinary output and creatinine must be monitored, and the concomitant use of loop diuretics should be avoided where possible
- IVIG may interfere with response to **live vaccines** - serological testing may be necessary - see SPC
- At least 98% of Privigen is immunoglobulin G (IgG)
- Maximum IgA content is 25 microgram per ml
- If dilution to a lower concentration is required,Privigen may be diluted with Glucose 5% to a

final concentration of 50mg/ml (5%). Example: Mix 50ml Privigen 10% solution with 50ml Glucose 5%(may result in increased blood glucose levels)

Storage

- Store below 25^{0}C, do not freeze

References

SPC Privigen 100mg/ml solution November 2017

1. Communication with Dr Tormey, Immunologist, by email March 2011

2. Department of Health Clinical Guidelines on the use of Intravenous Immunoglobulins 2011-second edition update

3: NIAC immunisation guidelines Measles Prophylaxis - see page 19

Therapeutic classification

Intravenous immunoglobulin