

## 5. SCIG hospital administration – in children

**Every country and institution may have different regulations regarding immunoglobulin therapy administration. Some of the steps/measures given below may not be necessary. Please follow your local and national guidelines.**

Subcutaneous IgG (SCIG), depending on the indication, is prescribed and given on regular basis at various doses.

SCIG is well tolerated by the majority of the patients, but it is important to note that each patient may react differently to different immunoglobulin products. Each patient may also require an individualized infusion regimen in order to minimise adverse events and to achieve the desired therapeutic response (1). SCIG can be given at a frequency varying from daily to once every 3–4 weeks; the latter is only possible with facilitated SCIG (2-4). Once a successful regimen has been established, it should be adhered to at every infusion. Every follow-up visit should include a review of the administration route, premedication and patient treatment satisfaction. A change of route or product may be required; the geographic location of therapy administration may also be changed (hospital or home-therapy).

Local reactions are seen in about 80% of the patients starting with SCIG. The most common are swelling, redness and induration (5). However, these reactions usually subside over time (6). For further information, please refer to the section on adverse event management (Appendix 4).

SCIG can be administered *via* a pump or manual push (4, 7, 8).

The patient/legal representative(s) should:

- Be aware of the possible adverse events (including delayed and late adverse event)
- Know what to do in case of adverse event
- Have a telephone contact to call for advice

For patients already receiving IgG therapy, administer the first dose approximately one week after the last infusion of their previous treatment. Different possibilities are available to start treatment-naïve patients on SCIG (see FYI box).

### **FYI**

Treatment-naïve patients can be started on SCIG treatment with a normal weekly dose. Alternatively, IVIG or SCIG loading doses can be given to reach steady-state levels more quickly. In this case, the entire weekly dose is given every day for 3 to 5 consecutive days.

### **SCIG – pump administration in children**

For detailed rationales, please see explanations below the list

#### **Before the first infusion**

- Check the patient's identity and the prescription according to the hospital policy
- Assess the understanding of therapy with the child and its legal representative(s)
- It is advisable to have a written informed consent from the child (from 16 years onwards, please refer to national legislation), and/or from their legal representative(s); please check with your local guidelines
- Describe possible adverse events to the patient or the legal representative, including possible flu-like symptoms after the first 2 to 3 infusions, and record any adverse events
- Complete pre-treatment blood tests (according to local protocol/agreement) (Rationale 1)
- Check immunoglobulin trough levels regularly in antibody deficient patients (Rationale 2)
- Assess the patient's general health, including temperature, pulse and blood pressure (for vital signs, please refer to your local guidelines to see when assessment is required)(Rationale 3)

#### **Pre-infusion assessment for the next infusions**

- Check the patient's identity and the prescription according to the hospital policy
- Assess for any weight loss or gain (Rationale 4)
- Assess that the immunoglobulin product ordered is the product prescribed for the patient, check the product name, dose, and expiry date
- Inspect product for clarity and colour (Rationale 5)
- The immunoglobulin should be at room temperature before the infusion (Rationale 6)
- Although rarely needed with SCIG, assess the need for premedication (Rationale 7)
- Assess if pre-treatment blood tests are required
- After careful assessment of subcutaneous tissue, 5–10 mL per site can be infused over one hour in babies (1–6 months), or 10 mL per site in 40–60 minutes in children older than 6 months. In older children/young people, 10–25 mL can be infused in 40–90 minutes. Volumes of 25 mL and larger may need to be divided into several sites (9)

#### **Equipment**

- Local anaesthetic cream/spray or cryogenic spray may be applied to the SC site (10)
- Immunoglobulin product for subcutaneous use. Please note: doses should be rounded to the nearest whole bottle size to prevent wastage
- SC infusion pump, able to give adequate infusion rate and pressure
- Needles or mini-spikes and syringes for drawing up the immunoglobulin solution
- Infusion set
- Needle for subcutaneous use, 45° to 90° angle, gauge size 24G to 27G, 6–14 mm length
- Disinfectant
- Gauze
- Adhesive tape

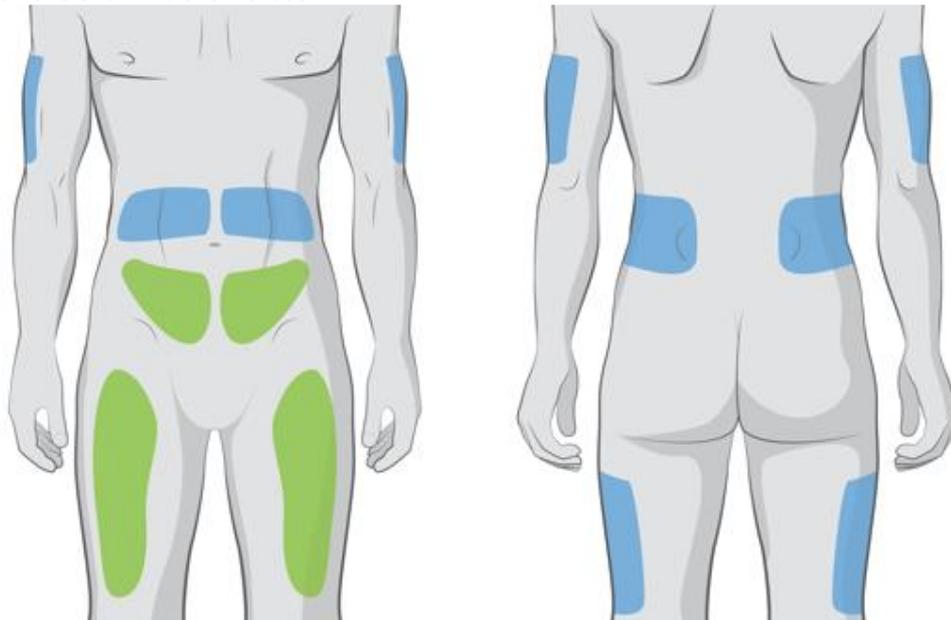
- Sharps container

### Infusion (11)

(Please see troubleshooting in Appendix 6)

- Wash and disinfect your hands and working surface thoroughly (Rationale 8)
- Use aseptic technique when preparing and administering infusion
- Draw the immunoglobulin into a syringe
- Prime the SC infusion set with immunoglobulin up to 1 cm before the tip of the needle (Rationale 9)
- The suggested site(s) for SCIG infusion are the abdomen and thighs (see figure). If two sites are required, two opposite sides of the body should be used. Avoid bony prominences, or areas that are scarred, inflamed or infected.

**Figure: SCIG infusion sites**



Green areas show preferred infusion sites; other alternatives are shown in blue.

- Clean infusion sites with alcohol wipes and allow to dry (not standard practice in all countries)
- Create a skin fold and insert needle for subcutaneous use into the subcutaneous tissue in the area that was anesthetized (at an angle of 45° to 90°, depending on the needle)
- When the infusion needle is placed, gently pull back the plunger of the syringe to see if any blood flows back into the line. Disconnect the syringe from the infusion set to check for blood (not standard practice in all countries). If blood is observed, change infusion set and insert a new needle in another location (Rationale 10)
- Secure the needle with adhesive dressing or use the dressing provided with the needle
- Attach the infusion set to the pump
- Do not leave the child unattended during infusion
- At the end of the infusion, remove the needles and dispose of all disposable supplies according to hospital policy
- Check the infusion site for local reactions
- Assess patient for any other adverse events
- Apply post infusion dressing if required
- Assess patient comfort levels and satisfaction

**Careful documentation of every SCIG infusion should include:**

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- The patient's current health status, medications and any changes in this status in the period between infusions
- The product name, dose and batch numbers of the products used (Rationale 11)
- Any pre-medications which were given
- Duration of infusion and any rate titrations made
- Any problems experienced by the patient during infusion and what was done to address them
- Patient treatment/infusion satisfaction
- Next appointment

### Rationale 1

Patients should be tested for exposure to known blood borne pathogens **before** starting SCIG therapy. Once immunoglobulin therapy has been started, serologic tests may become positive because of the passively transferred antibodies and not be informative of the patient's infection status. Normally, health centres test for HIV and hepatitis A, B, and C, and measure complete blood count, hepatic transaminases and renal function before initiating immunoglobulin therapy by any route. In hematologic disease, Coombs' testing should be done prior to SCIG therapy ([www.uptodate.com/contents/general-principles-in-the-use-of-immunoglobulin?source=search\\_result&search=intravenous-immunoglobulin&selectedTitle](http://www.uptodate.com/contents/general-principles-in-the-use-of-immunoglobulin?source=search_result&search=intravenous-immunoglobulin&selectedTitle)). In immunodeficient patients, serologic tests are frequently not informative because patients are not able to form antibodies specific for these pathogens. A negative serologic test in a patient with immune deficiency does not mean that the patient has not been exposed to the pathogens. PCR tests are used to detect active infection with Epstein-Barr virus, CMV and Hepatitis B.

### Rationale 2

To monitor the effectiveness of treatment.

### Rationale 3

To establish what is normal for each patient and detect potential infusion-related abnormalities. During infusion, an alteration of vital signs could indicate an adverse event. If fever is present and/or other signs of an acute infection the infusion may need to be postponed until antibiotic treatment is started and/or fever settles. Infusing when a patient has an acute infection can lead to adverse events such as immune complex reactions.

### Rationale 4

Immunoglobulin therapy depends on patient weight, among other parameters. Any significant change in weight may indicate a need for dose increase or (less likely) reduction. The weight is also important to calculate the infusion rate.

### Rational 5

The liquid should be clear and transparent; if it is cloudy or has deposits, the product should not be used.

### Rationale 6

Systemic adverse events are very rare in SC administration, however, they are more likely to occur with cold immunoglobulin solutions (fridge temperature),

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with the first infusion, a fast infusion, a large infusion, a long interval since the prior infusion, a switch to a new product or batch number, or the presence of a current infection (12). The most common immediate reactions are headache, cold sweat, light dizziness, chills, fever, and muscular pain. These are usually mild and occur within an hour of starting an infusion and disappear within 6 hours. Both pharmacologic and non-pharmacologic interventions (supplying blankets or pillows, heating pads and encouraging the use of relaxation techniques) may be indicated.

Although local reactions are very common with SC administration (local itchiness, swelling and redness) they are deemed normal and are not considered worrisome.

### Rationale 7

Premedication is rarely necessary when using SCIG therapy; it is only given if there has been a recent systemic adverse event. Many adverse events can be minimized or prevented by oral premedication, for example with antihistamines, steroidal or non-steroidal anti-inflammatory agents (12).

### Rationale 8

Good hygiene is an important aspect in infection prevention.

### Rationale 9

When in direct contact with the skin, immunoglobulins can cause local reaction.

### Rationale 10

Accidental IgG infusion in a blood vessel increases the risk of systemic adverse events.

### Rationale 11

Although the risk of transmission of blood-borne infections with currently licensed SCIG products is minimal, it is still present. The dose, brand, batch number, expiration date, and manufacturer of any immune globulin product infused into any patient should be carefully recorded in the medical record, as is done for all blood products. In addition, patients should be trained to keep their own logs of this information, as it is often required by law to have donor-to-recipient traceability.

## SCIG – manual push administration in children

For detailed rationales, please see explanations below the list

### **Before the first infusion**

- Check the patient's identity and the prescription according to the hospital policy
- Assess the understanding of therapy with the child and its legal representative(s)
- It is advisable to have a written informed consent from the child (from 16 years onwards, please refer to national legislation), and/or from their legal representative(s); please check with your local guidelines
- Describe possible adverse events to the patient or the legal representative, including possible flu-like symptoms after the first 2 to 3 infusions, and record any adverse events
- Complete pre-treatment blood tests (according to local protocol/agreement)  
(Rationale 1)

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- Check immunoglobulin trough levels regularly in antibody deficient patients (Rationale 2)
- Assess the patient's general health, including temperature, pulse and blood pressure (for vital signs, please refer to your local guidelines to see when assessment is required)(Rationale 3)

### **Pre-infusion assessment for the next infusions**

- Check the patient's identity and the prescription according to the hospital policy
- Assess for any weight loss or gain (Rationale 4)
- Assess that the immunoglobulin product ordered is the product prescribed for the patient, check the product name, dose, and expiry date
- Inspect product for clarity and colour (Rationale 5)
- The immunoglobulin should be at room temperature before the infusion (Rationale 6)
- Although rarely needed with SCIG, assess the need for premedication (Rationale 7)
- Assess if pre-treatment blood tests are required
- After careful assessment of subcutaneous tissue 5–10 mL per site can be infused in babies and young children. In older children or children with good subcutaneous tissue, up to 20 mL per site can be infused. In skinny children, the dose may be split over several sites (13)

### **Equipment**

- Local anaesthetic cream/spray or cryogenic spray may be applied to the SC site (10)
- Immunoglobulin product for subcutaneous use. Please note: doses should be rounded to the nearest whole bottle size, to prevent wastage
- Needles or mini-spikes and syringes for drawing up the immunoglobulin solution
- Butterfly needle 23G (blue), approx. 45° insertion angle
- Disinfectant
- Gauze
- Adhesive tape
- Sharps container

### **Infusion (11)**

(Please see troubleshooting in Appendix 6)

- Wash and disinfect your hands and working surface thoroughly (Rationale 8)
- Use aseptic technique when preparing and administering infusion
- Draw the immunoglobulin into a single syringe
- Remove the drawing needle (or mini-spike) from the syringe and replace it with the butterfly needle
- Do not prime the needle with the immunoglobulin solution (Rationale 9)
- The suggested site(s) for SCIG infusion are the abdomen and thighs (see Figure). Avoid bony prominences, or areas that are scarred, inflamed or infected.

**Figure: SCIG infusion sites**



Green areas show preferred infusion sites; other alternatives are shown in blue.

- Clean infusion sites with alcohol wipes and allow to dry (not standard practice in all countries)
- Create a skin fold and insert needle for subcutaneous use into the subcutaneous tissue in the area that was anesthetized (at an angle of approx. 45°)
- When the needle is placed, gently pull back the plunger of the syringe to see if any blood flows back. If blood is observed, start over in another location with a new needle (Rationale 10)
- Inject the immunoglobulin gently, with a rate of 1 mL per minute per site
- At the end of the infusion, remove the needles and dispose of all disposable supplies according to hospital policy
- Check the injection site for local reactions
- Assess patient for any other adverse events
- Apply post injection dressing if required
- Assess patient comfort levels and satisfaction

### Careful documentation of every SCIG infusion should include:

- The patient's current health status, medications and any changes in this status in the period between infusions
- The product name, dose and batch numbers of the products used (Rationale 11)
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### Rationale 4

Immunoglobulin therapy depends on patient weight, among other parameters. Any significant change in weight may indicate a need for dose increase or (less likely) reduction. The weight is also important to calculate the infusion rate.

### Rationale 5

The liquid should be clear and transparent; if it is cloudy or has deposits, the product should not be used.

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Systemic adverse events are very rare in SC administration, however, they are more likely to occur with cold immunoglobulin solutions (fridge temperature), with the first infusion, a fast infusion, a large infusion, a long interval since the prior infusion, a switch to a new product or batch number, or the presence of a current infection (12). The most common immediate reactions are headache, cold sweat, light dizziness, chills, fever, and muscular pain. These are usually mild and occur within an hour of starting an infusion and disappear within 6 hours. Both pharmacologic and non-pharmacologic interventions (supplying blankets or pillows, heating pads and encouraging the use of relaxation techniques) may be indicated.

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