Introduction:

- **Subcutaneous Immune Globulin (SCIG)** has become a popular method of drug administration.
- Those likely to use the subcutaneous route of infusion typically:
  - Want to have more freedom to plan their infusions.
  - Carry a Primary Immune Deficiency diagnosis.
  - Have poor venous access.
  - Have significant systemic side effects when receiving IVIG.
- Currently this route of administration has only been approved for the treatment of Primary Immune Deficiency.
  - Some with autoimmune disorders have successfully transitioned to using the subcutaneous route of administration.
  - Requires more frequent infusions.
- **SCIG** allows patients to focus on other important aspects in their daily living and not plan an IV infusion time around their day.
### IVIg vs. SCIG:

<table>
<thead>
<tr>
<th>IVIg</th>
<th>SCIG</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVIg is typically administered on a monthly basis.</td>
<td>SCIG is administered on a weekly basis.</td>
</tr>
<tr>
<td>IV access is needed for IVIG.</td>
<td>SCIG is administered subcutaneously.</td>
</tr>
<tr>
<td>IVIg is associated with more systemic side effects.</td>
<td>Patients receiving SCIG may exhibit less systemic side effects.</td>
</tr>
<tr>
<td>Most patients cannot administer IVIg independently.</td>
<td>Patients learn to be independent with SCIG administration.</td>
</tr>
<tr>
<td>Patients need to be monitored more closely when receiving IVIg products.</td>
<td>SCIG is administered in smaller volumes.</td>
</tr>
<tr>
<td>IVIg is administered in a larger volume.</td>
<td>Ig levels remain more consistent with SCIG administration.</td>
</tr>
<tr>
<td>Ig levels peak after infusion and drop over time which may result in early return of symptoms.</td>
<td>Patients may not need to pre-medicate before therapy.</td>
</tr>
</tbody>
</table>
## Subcutaneous Immune Globulin Products:

<table>
<thead>
<tr>
<th>Product</th>
<th>Concentration</th>
<th>Infusion Rates</th>
<th>Maximum Flow Rate / Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hizentra</td>
<td>20%</td>
<td>First infusion 15mL/hr per site, may increase to 25mL/hr on subsequent infusions.</td>
<td>Recommends not greater than 50mL/hr for all sites combined</td>
</tr>
<tr>
<td>Gammagard Liquid</td>
<td>10%</td>
<td>First infusion 20mL/hr per site, may increase to 30mL/hr on subsequent infusions.</td>
<td>Recommends not greater than 30mL per site</td>
</tr>
<tr>
<td>(greater than 88 lbs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gammagard Liquid</td>
<td>10%</td>
<td>First infusion 15mL/hr per site, may increase to 20mL/hr on subsequent infusions.</td>
<td>Recommends not greater than 20mL per site</td>
</tr>
<tr>
<td>(less than 88 lbs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gamunex C</td>
<td>10%</td>
<td>20mL/hr/site</td>
<td></td>
</tr>
<tr>
<td>Gammaked</td>
<td>10%</td>
<td>20mL/hr/site</td>
<td></td>
</tr>
</tbody>
</table>
Dosing

• Manufacturer package inserts recommend conversion factors when switching from IV to SC
  – Hizentra - 1.53:1
  – Gammagard, Gamunex – C, Gammaked – 1.37:1
• Some physicians start with 1:1 and increase dose based on response.
Recommended Injection Sites:

Recommended subcutaneous injection sites:

- It is recommended to administer SCIg in the following areas: abdomen, outer/inner thighs, hips, or upper arms

- Most prefer to use the abdominal area and rotate sites, staying at least 1 inch circumference away from umbilicus

- When using multiple sites, sites should be **2 inches apart**

- It is recommended that sites should be rotated with each infusion
Subcutaneous Space

- Needle placement is important
  - Must be in the space between the skin and the muscle
Administration Methods

• Pump and SC Set
  – Most frequently used pump is Freedom 60
  – Covered by Medicare Part B
  – Low PSI
Administration Methods

- Push injection without the aid of a pump
  - Smaller more frequent direct injections
  - Patient preference
  - Not currently on manufacturer package insert
Infusion Times

- Typical infusion time is 1 – 2 hours weekly
  - Can lengthen or shorten infusion time as tolerated
    - Pump tubing or program
    - # of infusion sites
    - Pharmacist can calculate number of sites and length of infusion for you
- For larger doses may need to infuse more than once weekly
Adverse Reactions to SCIG:

- The most common drug-related adverse reactions are local reactions at the injection site

- Local Reactions include: swelling, redness, heat, pain, and itching
  - Site reactions can also be caused by: needle length, wet prime, excess volume or fast infusion rate

- Systemic Reactions include: headache, nausea, vomiting, and fatigue

- It is important to continue to monitor for reactions that could occur with IVIG therapy including: renal dysfunction, thrombolytic events, aseptic meningitis syndrome and anaphylaxis
Frequent Causes of Site Reactions:

- Needle length can affect site reactions:
  - If the needle is too short, there may be increased irritation at the intradermal layer or leaking at the site
  - If the needle is too long, this may result in irritation to the muscle layer

- Wet prime
  - If primed through the needle tip the intradermal layer of skin is exposed to drug during insertion which causes irritation.

- Amount of volume infused

- Concentration of drug

- Thinner patient with less subcutaneous tissue
Needle Size Selection:

- Length range: 4 mm, 6 mm, 9 mm, 12 mm, 14 mm
  - Pediatric or small adults require shorter needles
  - Thin patients or very muscular patients may also require shorter needles
  - Most adults require a 9 mm needle
  - Heavier adults may require a 12 or 14 mm needle
Adverse Drug Reaction Management:

Some side effects are expected. Site reactions are expected and can be properly managed:

- **RAISED AREA AT INJECTION SITE:** Is expected. This should be consistent with the amount of volume infused and subcutaneous tissue for each person. Thinner people may notice a larger bulge. The volume may need to be decreased per site if this is uncomfortable.

- **REDNESS:** Is expected. The area of infusion will have some redness. Take note of area and record if there are changes such as redness which does not decrease over the next 24-48 hours.

- **ITCHING AT INJECTION SITE:** This is an expected side effect. The drug can cause itching. *HIVES are NOT a normal side effect and should be reported to the physician and provider*
Adverse Drug Reaction Management:

- Site location: may be too close to the muscle or too superficial
- Ensure use of dry insertion technique
- Rotate sites
- May consider the use of topical anesthetic ointments
- Work with your provider to make adjustments to infusion regimen as needed to help ensure the best infusion: needle length, location of sites, number of infusion sites, infusion rates, and site volume
Adverse Drug Reaction Management – Systemic Symptoms:

- **Headache**
  - Remain well hydrated.
  - May want to take Tylenol and Benadryl pre-infusion to help decrease headaches.

- **Chills**
  - May want to take Tylenol and Benadryl or other premeds as directed to help prevent and control flu-like symptoms.

- **Fatigue**
  - Rest as appropriate during and after therapy.

- **Nausea**
  - Remain well hydrated.
  - If nausea persists, may discuss antiemetic options with physician.
Severe Adverse Drug Reaction Management – Systemic Symptoms:

Although severe systemic adverse drug reactions are less common with SCIg, they may still occur. It is important to recognize these events and report immediately to your provider and physician if they are exhibited. These include:

- Aseptic Meningitis – severe headache; sudden onset, requires medical attention.
- Renal dysfunction – decrease in urine output, darkened urine color
- Cardiac alteration – changes in blood pressure, lightheadedness, chest tightness
- TRALI (transfusion related lung injury) – chest tightness, bluish color in lips, difficulty breathing
- Anaphylaxis – sudden onset of chest tightness, difficulty breathing, severe back pain, difficulty swallowing
- Clot formation
Important Things to Remember:

- **Aseptic technique and infection control:** Always disinfect infusion site with alcohol. Always disinfect medication rubber stopper. Never dry skin by blowing on site; allow to completely air dry.

- **Pump set-up/infusion set priming:** Make sure pump is properly set to load syringe. Always prime tubing and clamp prior to accessing site. Do not prime fluid through the end of the needle tip.

- **Subcutaneous needle insertion:** Rotate sites with each infusion. Avoid umbilical area (at least 1 inch). Insert needle at 90 degrees. Always **CHECK FOR BLOOD RETURN.** BLOOD RETURN SHOULD NOT BE PRESENT.
Important Things to Remember (cont.)

- **Proper storage and disposal:** Store drugs at room temperature. After administration, dispose needles and syringe into sharps container.

- **Expected Side Effects and Management:** Site reaction are a common side effects which usually minimize over time.

- **Documentation in diary (optional):** Maintaining a record of infusions helps to track side effects and general tolerability.
Insurance Coverage - Medicare

• Medicare covers subcutaneous IG, Freedom 60 pump and supplies under Part B for 5 specific PIDD diagnosis codes
  – 279.04 – Congenital Hypogammaglobulinemia
  – 279.05 – Immune Deficiency with Increased IgM
  – 279.06 – Common Variable Immune Deficiency
  – 279.12 – Wiskott Aldrich Syndrome
  – 279.2 – Combined Immunity Deficiency
• Nursing may be covered by Medicare Part A if patient meets homebound criteria
• Medicare will request proof of diagnosis periodically
Insurance Coverage - Medicare

• For any other diagnosis coverage may be available through a Medicare Part D plan
  – Requires authorization
  – Frequently initially denied as “Part B benefit”
  – Second denial may be issued due to non FDA indicated diagnosis
  – Appeal should address both diagnosis and Part B vs. Part D benefit.
  – Authorization period is usually one year

• No coverage for pumps, supplies, nursing under Part D
Insurance Coverage - Commercial

- Most commercial insurance companies cover SCIG
  - May require failure on IVIG first
    - Side effects, difficulty with IV access
  - Medical benefit – IG, supplies, pump, and nursing
    - Nursing may be limited to a few visits to teach self administration
  - Pharmacy benefit – May cover IG only
    - May require use of a specific pharmacy
  - Authorization periods vary – typical are 3 months, 6 months, 1 year
  - May require annual physician follow up including labs
Insurance Coverage - Medicaid

- Coverage varies by state
- May require authorization
- May require failure on IVIG first
Questions

• I have developed hard lumps. What are they and will they go away?
• Is SCIG safe in pregnancy?
• Is there anything on the horizon to make it easier to administer SCIG?
• If I developed aseptic meningitis on IVIG will I get it on SCIG?
• Can I use part of a vial on one day and save the remainder for the following week?