



# Subcutaneous IG Therapy: An Alternative

The success of four primary immune deficiency patients who switched from IVIG to SCIG treatment shows that this new form of IG therapy may, in some situations, be a beneficial alternative for some individuals.

By Mark R. Stein, MD

**P**primary immune deficiency (PID) encompasses more than 150 inherited disorders that impair different components of the immune system.<sup>1</sup> An estimated one in 1,200 individuals in the United States, or approximately 250,000 people, have been diagnosed with some form of PID.<sup>2</sup> The disorders are characterized by recurrent or unusual infections that rarely affect healthy people.<sup>3</sup> Antibody deficiencies are the most common forms of PID<sup>2,4</sup> and are usually associated with upper respiratory tract infections, most notably sinusitis and otitis media.<sup>2</sup> Treatment options for PID include intravenous or subcutaneous immunoglobulin (IG) replacement therapy, prophylactic treatment with antibiotics and immunizations, and, in some cases, gene therapy or bone marrow transplantation.<sup>5</sup>

Immunoglobulin replacement therapy is the cornerstone of treatment for many patients with PID, particularly for those with antibody deficiencies,<sup>5,6</sup> and intravenous immunoglobulin (IVIG) is the most popular form of IG therapy in the United States.<sup>5,6</sup> However, IVIG often requires administration at an office, infusion clinic or hospital. Most patients experience decreased infections, minimal side effects and have minimal inconvenience with IVIG. Yet, some patients find their IVIG therapy may be associated with certain systemic reactions, such as headache, chills, flushing, low back pain, nausea and, in rare instances, thromboembolic events.<sup>7,8</sup> Some patients experience a feeling of fatigue or notice an increased incidence of infections in the week prior to their IVIG infusion.

An alternative to IVIG is subcutaneous immunoglobulin (SCIG) therapy.<sup>9,10</sup> SCIG allows patients to self-administer infusions at home, and may be especially appropriate for people with PID whose veins are difficult to access, who cannot tolerate the side effects of IVIG, or who prefer the independence and flexibility of at-home administration. The following case studies describe how four people successfully switched from IVIG to SCIG therapy.

### Case 1

**Eddie is an 8-year-old boy** who was diagnosed at age 1 with X-linked agammaglobulinemia (XLA) and started on monthly IVIG therapy. However, even with IVIG treatments, Eddie continued to suffer from frequent sinus and bronchial infections. Thus, his parents were concerned about Eddie potentially being around sick children at school. Getting treatment for Eddie required one parent to take off work once every three weeks for the eight-hour roundtrip to Eddie's infusion appointment. Eddie's parents, Amanda and John, took turns bringing him for the infusions, but the time away from work was still a strain for them. In addition, the infusion schedule and other appointments stopped Eddie and his brother from participating in certain extracurricular activities they might otherwise have enjoyed.

Further, Eddie was having difficulty maintaining minimally protective serum IG levels above 500 mg/dL. A review of his medical records revealed that he had experienced one serious bacterial infection and six sinus or bronchial infections in each of the two years since he had started on IVIG. Despite altering his dosing regimen from every four weeks to every three weeks and increasing the dose, infections persisted. Eddie's parents continued to express concern with their child's potential exposure at school, and their infusion scheduling difficulties continued to cause discontent. Eventually, the family decided that home-based therapy for Eddie would be more appropriate for their busy schedules. Eddie's immunologist suggested SCIG.

Amanda and John quickly learned SCIG infusion techniques and are now very pleased with their ability to administer Eddie's IG therapy at home on their own schedule. They don't need to take time off work, and Eddie and his brother are able to participate in additional extracurricular activities. At first, Eddie experienced mild to moderate redness and swelling at the site of subcutaneous infusion, but this has decreased substantially with subsequent infusions. His IgG level increased, and his rate of infections decreased with his change of therapy.

### Case 2

**Catherine is a 45-year-old international consultant** with common variable immunodeficiency (CVID) who has received monthly IVIG therapy for eight years. She responded well to therapy, but her extensive, unpredictable travel schedule conflicted with her monthly IVIG infusions. Her infusions generally took four to six hours and were tolerable only when administered at a slower than normal rate. Further, the headaches and nausea that accompanied the infusions sometimes forced her to cancel important meetings.

Catherine's physician was concerned about the side effects of IVIG, and the possibility that her business travel and professional demands would interfere with her monthly infusions. He noted that she had either missed or rescheduled infusions, extending the time between treatments. Typically after missed treatments, she experienced repeated upper respiratory infections. So, at her physician's recommendation, Catherine switched to SCIG. She adapted quickly and has been very happy with her ability to infuse at home and on business trips. And, she is pleased that she can easily transport her infusion therapy products on business trips. Catherine has told her friends that she is less stressed about traveling because her trips no longer conflict with her IG therapy. She has not experienced systemic adverse events, and while she has experienced mild to moderate infusion site reactions, they decrease substantially after 24 hours, and have not disrupted her work schedule. With regular home therapy, she noticed a significant reduction in her rate of infections.

## *SCIG therapy offers an alternate route of administration for patients with poor venous access.*

## Vivaglobin SCIG Treatment

**Vivaglobin is the first and only 16 percent subcutaneous immunoglobulin therapy approved by the Food and Drug Administration for the treatment of primary immunodeficiency patients in the United States. Weekly subcutaneous therapy with Vivaglobin helps provide consistent protection against infections by maintaining consistent blood levels of immunoglobulin.**

### Case 3

**Margaret, a 77-year-old woman**, was diagnosed with CVID nine years ago and began receiving monthly IVIG therapy. She has been pleased with her overall health since starting IVIG therapy. However, since she does not drive, she incurred additional cost for transportation to and from the infusion clinic. Her IVIG treatments caused frequent headaches and resulted in pain in both arms due to her “poor” veins, making it difficult for her to take care of herself at home. Although she received medication prior to infusions and the infusion rate was slowed, Margaret continued to experience adverse events. She was unhappy with the lengthy infusion time, side effects and travel costs.

Margaret has limited peripheral vascular access after episodes of inflammation of her veins (phlebitis). Because she is often mildly dehydrated, her veins tend to collapse upon venipuncture. She was recently diagnosed with type 2 diabetes, and is now taking an oral antidiabetic drug and following a restricted diet. Because of the adverse reactions, Margaret required professional observation during infusions. After complaining to her physician about the adverse reactions, the difficulty of accessing a vein for injection and the duration of IVIG therapy, Margaret learned about SCIG.

Margaret has not experienced any systemic adverse events with SCIG. She has reported mild itching, redness and some swelling at the injection site, but these side effects decrease substantially within a day after the infusion. Margaret no longer requires professional observation of her therapy and is pleased with her ability to self-infuse at home on her own schedule. Because she is no longer distracted by the side effects she experienced with IVIG therapy, Margaret has been able to focus on managing her diabetes.

### Case 4

**Daniel is a 32-year-old building tradesman** with CVID who received monthly IVIG therapy for three years. Since his early 20s, he has suffered from increased frequent and unusual infections, including pneumonia. While IVIG therapy reduced Daniel’s recurrent bacterial infections, the therapy also caused consistent side effects, including headaches, chills, fever and severe nausea and diarrhea. His monthly IVIG therapy required six or more hours to infuse, plus an additional day of recovery. Because he is a non-union tradesman, Daniel does not receive paid days off. Thus, his lost wages and the out-of-pocket costs for treatment were both a financial burden for his family.

Daniel’s immunologist tried to reduce the systemic adverse events by switching Daniel to an IVIG product with a low IgA content. However, the reactions persisted. Because of these problems, Daniel decided to try SCIG.

Daniel adapted to self administration in one month and is very satisfied with SCIG. He has not experienced systemic adverse events. The injection site reactions are relatively mild and almost disappear after one day. Daniel is now able to maintain a full work schedule.



## Summary

As these cases illustrate, SCIG therapy, which is administered subcutaneously, offers the convenience of in-home administration and may benefit patients who face transportation challenges or who have a busy lifestyle. SCIG therapy carries a lower risk of systemic side effects for some patients than does IVIG therapy.<sup>8,11</sup> Finally, SCIG therapy offers an alternate route of administration for patients with poor venous access, a condition that may be particularly problematic for young children and elderly individuals. The above cases describe patients with ideal profiles for moving to SCIG therapy. However, it should be noted that SCIG is not appropriate for all patients, and IVIG remains an effective and well-tolerated alternative for many patients with PID. The choice to infuse intravenously or subcutaneously is personal. There are many factors that may lead the patient or physician to favor one or the other, and these factors should be carefully reviewed by the patient and physician together. At times, a patient will start one form of therapy and switch to the other based on side effects or inconvenience. ■

## References

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## Types of PID Described in Case Studies.<sup>1,4</sup>

The four people discussed in the case studies in this article are affected by two of the more common types of PID. Following are brief descriptions of each.

**Common variable immune deficiency.** This antibody deficiency typically presents with recurrent sinopulmonary infections with encapsulated or atypical bacteria. Laboratory results show a reduction in one or more classes of immunoglobulins (e.g., IgA, IgG, IgM) and an inability to produce sufficient antibodies in response to pathogen exposure. B cells (the white blood cells that play an important role in the antibody-mediated immune response) may also be reduced.

**Agammaglobulinemia.** This is an antibody deficiency that usually presents with recurrent sinopulmonary infections (particularly otitis media, sinusitis and pneumonia) in the first two years of life. The defining laboratory features are reduced or absent B cells, resulting in an almost total lack of immunoglobulins (antibodies) in the blood.

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*Editor's Note: This article presents successful case studies of SCIG. However, IG Living magazine does not endorse any particular method or product. Those decisions should be made by the individual patient in consult with his/her physician.*