

# Successful Transition from Subcutaneous Immune Globulin (SCIG) Therapy to Intravenous Immune Globulin (IVIg) Therapy in Primary Immunodeficiency: A Case Report

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## ABSTRACT

For patients with primary immunodeficiency (PI), immune globulin (Ig) is a lifelong therapy. This specialized infusion therapy is a safe and practical option for patients to receive in the comfort of their own homes. Intravenous immune globulin (IVIg) and subcutaneous immune globulin (SCIG) are clinically proven effective treatments for PI and offer distinct advantages and disadvantages for each route of administration.

Using patient characteristics to help guide decisions for intravenous or subcutaneous treatment, Ig therapy must be individualized to meet each patient's specific clinical needs with consideration for patient preferences.

The following patient case report describes a successful transition from SCIG to IVIg therapy, emphasizing the importance of patient choice and individualization of treatment.

**Keywords:** *chronic variable immunodeficiency, subcutaneous immune globulin, intravenous immune globulin*

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## Introduction

For patients with primary immunodeficiency (PI), immune globulin (Ig) is a lifelong therapy. This specialized infusion therapy is a safe and practical option for patients to receive in the comfort of their own homes. Intravenous immune globulin (IVIg) and subcutaneous immune globulin (SCIG) are clinically proven effective treatments for PI and offer distinct advantages and disadvantages for each route of administration.

Using patient characteristics to help guide decisions for intravenous or subcutaneous treatment, Ig therapy must be individualized to meet each patient's specific clinical needs with consideration for patient preferences.

The following patient case report describes a successful transition from SCIG to IVIg therapy, emphasizing the importance of patient choice and individualization of treatment.

## Patient Case Presentation

In 2015, a male in his 30s diagnosed with chronic variable immunodeficiency (CVID), 1 of the more than 400 types of PI, presented to our services for home infusion of IVIG. During his treatment from 2015-2020, the monthly IVIG infusions were generally well tolerated, with no reports of severe adverse drug reactions (ADRs) or hospitalization related to home infusion therapy. The patient's IVIG treatments included premedication with orally administered acetaminophen 650 mg and diphenhydramine 25 mg. After the first dose, hydration was added to the patient's treatment plan to be administered post infusion. He received sodium chloride 0.9% 500 mL administered intravenously. Throughout treatment, the patient reported mild ADRs described as fatigue and lethargy during the infusion and for 36 hours post-infusion.

In 2020, the patient requested a transition from IVIG to SCIG to determine if SCIG could effectively treat his CVID without the ADRs he experienced using IVIG. As a result, the patient received SCIG 20% 10 gm weekly (40 grams per month, 504 mg/kg/month). In addition, before each SCIG infusion, the patient received acetaminophen 650 mg and diphenhydramine 25 mg orally to prevent and treat SCIG ADRs.

In late 2021, the patient noted numerous ADRs from his weekly SCIG infusions and stated he felt better on the monthly infusion of IVIG. The patient's ADR list from SCIG included significant local swelling and pain, fatigue, lethargy, and complaints of back pain after each SC infusion. The ADRs were evaluated, and adjustments were made to slow the infusion. Additionally, the pharmacy changed the needle length from 9 mm to 12 mm to decrease local site reactions and ensure the distribution of Ig medication within the subcutaneous tissue. Despite making adjustments to eliminate or minimize the localized ADRs, the patient discussed a treatment plan with his prescriber to transition from weekly SCIG back to monthly IVIG infusions.

In December 2021, the patient was transitioned to IVIG 10% 30 gm every 4 weeks (357 mg/kg/4 weeks), administering the same brand of IVIG product previously used for IVIG treatment. He continued oral premedication with acetaminophen 650 mg and diphenhydramine 25 mg.

Serum level monitoring of IgG reported: 494 mg/dL (March 2016), 823 mg/dL (April 2021), 1283 mg/dL (July 2022), and 1347 mg/dL (January 2023). A comparison of the IV and SC doses showed that the patient's monthly IVIG dose (30 gm) was 25% less than the total monthly SCIG dose (40 gm).

Since the transition from SCIG to IVIG, the patient denies ADRs. Nursing assessments during monthly infusion visits noted that the patient's quality of life was improved after transitioning from SCIG to IVIG. The patient has remained stable on IVIG therapy since the transition. Patient preference was accommodated and resulted in improved patient satisfaction.

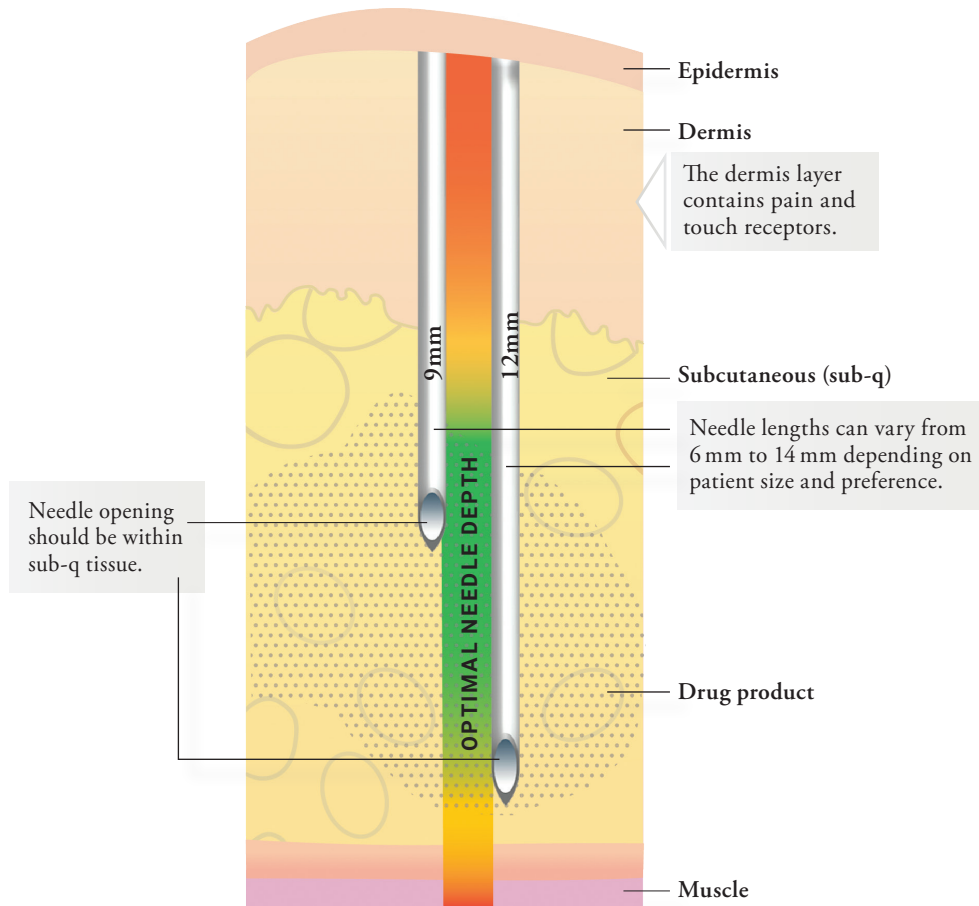
## Discussion:

This case report supports the successful transition of a patient receiving a SCIG product back to an IVIG product. Successful transition was defined as adherence to infusions, management of ADRs, and response to treatment. This patient case report provides detail on a situation where the patient care is individualized on a continuous basis in conjunction with changes in the patient's clinical or personal situations.

A literature review identified an observational study that collected patient preference data using surveys with questions related to IVIG and SCIG variables including the route of administration (IV or SC), dosing frequency, site of care, number of needle sticks, and duration of infusions. According to the study, surveys of 252 patients reported that the site of care was the most essential attribute, and the route of administration was the least important of the attributes surveyed. Patients preferred the home for the site of care and shorter, less frequent infusions. Route of administration alone did not motivate patients to switch from IV to SC, and the site of care and shorter, less frequent infusions influenced patient preferences.<sup>1</sup>

This patient case report highlights transitions between 2 routes of Ig infusions and the impact of the patient being an integral participant in the decision-making process. The start of care began with the patient receiving IV, followed by the transition to self administering SC, and then transitioned back to IV for quality-of-life preferences. The patient experienced ADRs with both administration methods. Initially, ADRs

FIGURE 1  
Needle Placement for Subcutaneous Administration of Ig



from IVIG were treated with premedication, slowing the infusion rate and hydration. When administering SCIG, the pain and swelling were managed by slowing the infusion rate and adjusting the needle length to a longer needle. The longer needle length was necessary for proper placement in the deeper subcutaneous tissue and prevented infusion into the dermis (see Figure 1). The ADRs continued despite adjusting the needle lengths and ancillary supplies. The patient underwent  $\geq 11$  months of SCIG infusions before transitioning back to IVIG. The patient's CVID was managed effectively by treatment administered either IV or SC, and both options were available to the patient. Over the 7 years in this case report, the patient's specialty pharmacy

clinical team of nurses and pharmacists assisted the patient with changes to the treatment plan. They counseled the patient on the advantages and disadvantages of IV and SC administration and communicated regularly with the patient's prescriber. The professional services of pharmacists and nurses created seamless transitions between IV and SC.

Differences in IV and SC administration play a role in ADRs. Increased prevalence of systemic reactions was expected in IVIG and more local reactions in SCIG.<sup>2</sup> IVIG is generally administered in a single monthly dose, while SCIG is divided into weekly/bi-weekly infusions. The most common systemic ADRs for IVIG are headache and nausea. Many

IVIG ADRs are manageable with interventions such as slowing the rate of administration, oral or IV hydration, and providing medications for supportive treatment (antihistamines, antipyretics, or corticosteroids).<sup>3</sup> The most common systemic ADRs for SCIG are similar to IVIG, but frequency and severity are generally less than IV. The most common ADR of SCIG is local infusion site reactions such as redness, itching, and swelling that can improve over time. This is unique to the SC route of administration and may lead a patient to transition from SC to IV.<sup>3</sup>

While IVIG or SCIG is a choice left to the discretion of each patient and their treating physician, several factors warrant consideration so that patients can make informed decisions that balance their needs, preferences, and lifestyles.<sup>3</sup> According to a prospective observational study, 304 adult Ig patients were monitored over an

18-month duration of Ig treatment. Analysis of the individual health-related quality of life (HRQoL) measures revealed that differences in route and dosing schedules did not impact HRQoL in patients receiving Ig when treatment choice is shared by the patient and prescriber.<sup>4</sup>

The Immune Globulin Nursing Standards of Practice emphasize interdisciplinary aspects of patient care and include prescribers, pharmacists, and nurses.<sup>2,5</sup> Successful treatment depends on expert clinical knowledge, experience, and a collaborative health care environment.<sup>2</sup> Clinicians and care providers can better serve patients when the decisions related to treatment variables of Ig largely remain a patient choice.

## Conclusions

This patient case report highlights the importance of recognizing patient preference when choosing the route of administration for Ig therapy.

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