Reducing SCIG Side Effects

Autoimmune Encephalitis: The ‘Brain Under Attack’

The Role of Vitamins and Minerals in PI and AD

Discrimination: What Rights Do Patients Have?
Get Connected
Your Complete Resource for Advocacy, Education and Support

On IGLiving.com

Features an easy-to-navigate design

Indepth content on IG-treated diseases and treatment

Connect with our Patient Advocate, Abbie Cornett

Read weekly blogs about issues related to living with chronic illness

Valuable Resources and more
On Facebook
Find timely and relevant information posted daily, providing a venue for connecting with others in the IG community.

On the Go
The IG Living App allows you to connect Anytime, Anywhere! And it is FREE!
Up Front

5 Editorial
Exploring the Relationship Between PI and Other Diseases
By Ronale Tucker Rhodes, MS

6 Abbie’s Corner
How Safe Are Your Health Records?
By Abbie Cornett

7 Faces of IG
From our Facebook page
By Abbie Cornett

Departments

8 Ask the Experts
Healthcare professionals’ responses to patient questions

9 Immunology 101
DiGeorge Syndrome: Restoration of Normal Immunity
By Terry O. Harville, MD, PhD

10 Clinical Brief
Reducing SCIG Side Effects
By Michelle Greer, RN

12 In the News
Research, science, product and insurance updates

Columns

40 Let’s Talk!— Jessica Goddard
By Trudie Mitschang

42 Patient Perspective — Stacey Philpot
Chronic Illness: Your Travel Companion
By Stacey Philpot

43 Life as a 20-Something — Ilana Jacqueline
When Chronic Illness Seems to Rule Out Parenthood
By Ilana Jacqueline

44 Parenting — Jessica Leigh Johnson
Are Your Children Ready for a Cell Phone?

Features

14 Cancer Risks in PI Patients
By Terry O. Harville, MD, PhD

18 Autoimmune Encephalitis: The ‘Brain Under Attack’
By Ronale Tucker Rhodes, MS

24 Discrimination and Patient Rights
By Trudie Mitschang

28 The Role of Vitamins and Minerals in Immune Deficiencies and Autoimmune Disorders
By Mindy Hermann, MBA, RDN

32 Subcutaneous Immune Globulin Maintenance Therapy for CIDP: An Idea Whose Time Has Come
By Keith Berman, MPH, MBA

Sources

46 Product Guide
Protecting Patient Privacy at the Touch of a Button
By Heather Bremner Claverie

48 Book Corner
New and useful reading

50 Resource Center
Community foundations, associations, forums and other resources

Advertising in IG Living
IG Living Magazine is read by 30,000 subscribers who are patients that depend upon immune globulin products and their healthcare providers. For information about advertising in IG Living, download a media kit at igliving.com/Advertise.aspx. Or contact advertising@igliving.com.

About IG Living
IG Living magazine brings together patients, advocates and caregivers in the immune globulin (IG) community.

IG Living, (ISSN 1949-4548), published bimonthly, is a community service provided by FFF Enterprises, 44000 Winchester Road, Temecula, CA 92590, (800) 843-7477 x1362, fax (951) 699-9655.

Subscriptions to IG Living are free, and readers may subscribe at IGLiving.com or by calling (800) 843-7477 x1351.

The opinions expressed in IG Living are those of the authors alone and do not represent the opinions, policies or positions of FFF Enterprises, the Board of Directors, the IG Living Advisory Board or editorial staff. This material is provided for general information only. FFF Enterprises does not give medical advice or engage in the practice of medicine. FFF Enterprises under no circumstances recommends any particular treatment for any individual and in all cases recommends individuals consult with a physician before pursuing any course of treatment.

IG Living accepts article submissions. Submit manuscripts in MS Word format, or submit a query letter that covers the idea in a brief paragraph and how it will be presented, to editor@igliving.com. IG Living retains the right to edit submissions. The contents of each submission and their accuracy are the responsibility of the author(s) and must be original work that has not been, nor will be, published elsewhere, without the written permission of IG Living. A copyright agreement attesting to this and transferring copyright to FFF Enterprises will be required. Acceptance of advertising for products and services in IG Living in no way constitutes endorsement by FFF Enterprises. ©2019 FFF Enterprises Inc.
Exploring the Relationship Between PI and Other Diseases

Scientists are increasingly recognizing the relationship between various diseases. In fact, in the past decade or so, much has been learned about how primary immunodeficiency diseases (PIs) are associated with higher risks of other diseases. This issue looks at two associated disease risks — one that is the second-leading cause of death in the U.S., and another that is extremely rare.

A cringe-worthy word for centuries, cancer has increasingly narrowed the gap with heart disease, the leading cause of death. And, cancer is indeed an issue for 10 of the more than 350 different types of PI. Most notably, it is associated with common variable immunodeficiency (CVID) patients who account for nearly one-quarter of all PI cancer diagnoses, and who have a five to eight times greater risk than the general population over a lifetime of developing lymphoma. Immunologist Terry O. Harville discusses the types of cancer diagnoses in PI patients in his article “Cancer Risks in PI Patients” (p.14). However, most importantly, he delves further into what the incidence rates really mean and how those risks can be evaluated and mitigated. As Dr. Harville notes, altering lifestyle issues, identifying family risks with specific gene mutations, regular screening and establishing good patient-physician relationships all can help to ensure cancer is identified and treated early.

While some autoimmune disorders appear prolific today, many of them are extremely rare. The latter is the case for autoimmune encephalitis (AE) that affects only about one in 200,000 people per year. To date, there has been only one report describing a possible link between immune-mediated limbic encephalitis, one of the main types of AE, and immune deficiency.1 But, AE and PI share a first-line treatment protocol of intravenous immune globulin. In our article “Autoimmune Encephalitis: The ‘Brain Under Attack’” (p.18), we take an in-depth look at AE’s symptoms and causes, as well as how it is diagnosed and treated.

Regrettably, individuals with PI and other concomitant chronic illnesses are often subjected to additional challenges, one of which, unfortunately, is discrimination. As we discuss in our article “Discrimination and Patient Rights” (p.24), patients are afforded many rights with the enactment of the Americans with Disabilities Act. Yet, discrimination by health insurance carriers, employers and others still occurs. We explore these concerns and detail what patients can do to protect and advocate for themselves under the law.

As always, we hope you enjoy these articles, as well as the many more educational and insightful topics presented in this issue of IG Living.

How Safe Are Your Health Records?

By Abbie Cornett

Patients eagerly awaited the day when they wouldn’t have to spend hours tracking down their health records every time they moved or went to a new doctor. That dream came a step closer to reality when the American Recovery and Reinvestment Act was signed into law by President Obama in 2010 with a goal to create more funding and a network of incentives that could be directly resourced toward healthcare professionals who were ready to adopt electronic health records (EHRs).

While the original purpose of EHRs was for billing purposes, policymakers and healthcare providers soon realized the potential EHRs hold for decreasing medical errors by providing improved access to necessary information, better communication and integration of care between different providers and visits, and more efficient documentation and monitoring. Additionally, EHRs can reduce costs by eliminating redundant or unneeded treatments.

While the goal of improved patient outcomes is a good thing, it has come with a price tag. A significant challenge is the cost of infrastructure, which includes purchasing the needed hardware and software to collect patient data and maintaining the systems once in place. Since the implementation of EHRs, healthcare organizations have seen a sharp increase in the amount of patient data available to them. Unfortunately, they did not prepare to keep these records safe.

This is especially troubling considering electronic protected health information is an extremely attractive target for hackers and cybercriminals because it contains personal information such as social security numbers, financial and health insurance information, driver license numbers and more. Besides the quality of data, the healthcare sector is of particular interest to cybercriminals because the industry lags significantly behind other sectors in terms of data security. In fact, the industry has one of the lowest rates of data encryption, with only 31 percent of healthcare organizations reporting extensive use of encryption and 20 percent reporting they don’t use encryption at all.

Further, “many organizations have not crossed the digital divide in not having the technology resources and expertise to address the current and emerging cybersecurity threat.” In addition, many organizations have unsupported legacy systems that cannot be replaced without a significant cost.

Unfortunately, patients have the common misconception that only large organizations are targeted by cybercriminals. But, this is untrue. Small practices and rural hospitals are just as much at risk. Indeed, organizations of all sizes are at risk due to the interconnectedness of healthcare. A breach of a small medical office or hospital can be a point of entry to a larger health system.

Because of the scope of the problem, the U.S. Congress established the Health Care Industry Cybersecurity that identifies six high-level recommendations and action items for the healthcare industry:

- Define and streamline leadership, governance and expectations for healthcare industry cybersecurity.
- Increase the security and resilience of medical devices and health information technology.
- Develop the healthcare workforce capacity necessary to prioritize and ensure cybersecurity awareness and technical capabilities.
- Increase healthcare industry readiness through improved cybersecurity awareness and education.
- Identify mechanisms to protect research and development efforts and intellectual property from attacks or exposure.
- Improve information sharing of industry threats, weaknesses and mitigations.

Currently, healthcare organizations have the ability to share and gather huge amounts of data that can lead to more efficient care and treatment of patients. This ability, though, has exposed them to cyberattacks they are ill-prepared to counteract. Clearly, the healthcare industry must make haste to secure their systems against attacks to protect the patients they serve and themselves.

Abbie Cornett is the patient advocate for IG Living magazine. She can be reached at advocate@igliving.com or (800) 843-7477 x1366.

References
Should I tell my employer about my illness?

I was hired by an employer four weeks after I had cancer surgery years ago, and I then had to take off time for my radiation treatment. That’s the only reason I told them, and I managed to stay employed there about a year and then quit on my own terms. But, with another employer, after I was diagnosed with another condition, I disclosed it to them and I still wound up getting fired. Nope, I would never tell the employer anything unless I absolutely have to.

— Rachel D

Do you sleep with a fan on?

I do because I have tinnitus, and the fan works the same as a white noise generator. I also like the feeling of the air as it passes over my face.

— Connie K

Yes. I have tinnitus, and it helps [detract] from that. Also, white noise is so calming. I use room purifiers during the day for allergies so fans aren’t throwing out so many allergens.

— Vicki DH

No. I find I get sick easier if there is a fan blowing in the room.

— Jane N

Do you practice self-care?

Yes, I do take care of myself. I treat myself to things I enjoy. But, even that, at times, is not sufficient. With a chronic illness, a flare-up can and will happen under the best of situations. My life has changed drastically, and because of that, I must make myself the No. 1 priority. The hardest thing for me to do was learn to say no, and that didn’t come without some resistance from people. Then, I had to learn that guilt was not going to set in. And, taking care of myself also means the people around me do not drain me physically and emotionally. Last, but most important, is having a primary care physician who is an integral part of my life so I am able to be a part of life outside of my disease.

— Judy S

Absolutely. I drastically changed my diet to whole-food plant-based with the book Super Immunity by Dr. Joel Fuhrman. I added yoga and Pilates, and I do physical therapy regularly in a hot pool. Meditation and relaxation are key in my journey, too.

— Shawna WN

Join the conversation! Connect with other immune globulin patients through IG Living’s Facebook page at www.facebook.com/IGLivingMagazine. See our daily posts of interesting articles and facts, as well as thought-provoking questions that you can chime in on. Following are some snapshots of what’s being discussed.
**Abbie** Unfortunately, headaches are a common side effect of intravenous immune globulin (IVIG) therapy. I spoke with one of our medical experts who recommends slowing the rate of your infusion even more. According to her, your infusion rate is still high for someone who suffers headaches. She advises a top rate of 100 ccs per hour. You could also consider infusing over two days (four hours each day). If the headaches continue, you should discuss changing IVIG brands with your treating physician since not all brands cause the same side effects.

**Question**
What Can Be Done Other Than Premedications to Reduce Headaches After IVIG Infusions?

I am treated with 70 grams of Gammagard every other week. My premedications include 50 mg of intravenous Solu-Cortef, 30 mg of intravenous Toradol, 1,000 mg of Tylenol, 25 mg of Benadryl, 4 mg of Zofran and 10 mg of Zyrtec. My infusion takes six hours, and the maximum rate is set at 150. At home after the infusions, I take 1,000 mg of Tylenol, 50 mg of Benadryl, 10 mg of Toradol and 4 mg of Zofran every six hours. I also drink as much water as I can. Yet, I still get bad headaches that require me to stay in bed with ice. What do you recommend to reduce the headaches down to a five or below on the pain scale?

**Abbie** According to one of our experts, a chronic lung infection increases side effects with IVIG infusions, particularly fevers, chills, back aches, body aches, loose stools and headaches, which may be worsened by more rapid infusions. Our expert says three hours is too short. Instead, he recommends an infusion time of between five and six hours.

IVIG infusions are not generally related to hair loss. Rather, some patients see improvement in hair growth with IVIG treatment. On the other hand, thyroid dysfunction is definitely a cause of hair loss. In addition, IVIG should not worsen thyroid dysfunction, but rather improve autoimmune thyroid disease. Check with your physician about increasing the dose of Synthroid.

**Question** Can IVIG Cause Hair Loss and Increase the TSH Level?

I am 68 years old and have bronchiectasis and cough blood. I also developed nontuberculous mycobacterial lung disease. My pulmonologist suggested intravenous immune globulin (IVIG), which I have been treated with for almost two years. Are my back aches, body pains, headaches, etc., related to IVIG and not just old age? Also, I have lost a lot of hair. Is that also due to the IVIG? I have been taking Synthroid for years, but in the last few months, I started experiencing thyroid-type symptoms (both physical and mental). The first tests showed my thyroid-stimulating hormone (TSH) level was low. And, I was just retested, and the TSH level is even lower. I recently changed locations where I am treated with IVIG, and the infusions are shorter. They used to take five hours, and now they only take three hours. Could the IVIG be affecting my TSH level?

**Abbie** According to one of our experts, a chronic lung infection increases side effects with IVIG infusions, particularly fevers, chills, back aches, body aches, loose stools and headaches, which may be worsened by more rapid infusions. Our expert says three hours is too short. Instead, he recommends an infusion time of between five and six hours.

IVIG infusions are not generally related to hair loss. Rather, some patients see improvement in hair growth with IVIG treatment. On the other hand, thyroid dysfunction is definitely a cause of hair loss. In addition, IVIG should not worsen thyroid dysfunction, but rather improve autoimmune thyroid disease. Check with your physician about increasing the dose of Synthroid.

Have a question? Email us at editor@IGLiving.com. Your information will remain confidential unless permission is given.

ABBIE CORNETT is the patient advocate for IG Living magazine.
DiGeorge Syndrome: Restoration of Normal Immunity

By Terry O. Harville, MD, PhD

The lack of thymus development in complete DiGeorge syndrome (CDGS) results in severe, life-threatening immunodeficiency due to lack of T lymphocyte development. From a clinical perspective, the CDGS patient will appear to have severe combined immunodeficiency (SCID), which can be cured with bone marrow transplantation (BMT) or hematopoietic cell transplantation (HCT). Fortunately for patients with SCID, there is sufficient thymus to allow for the stem and progenitor cells from the donor BMT/HCT to develop into T lymphocytes, and thereby allow for reconstitution of immunity. But, in CDGS, because there is no thymus, there is no platform for stem or progenitor cells to develop into T lymphocytes. Therefore, donor BMT/HCT is not curative in CDGS. Instead, thymus transplantation is needed.

When this procedure was first considered, similar to a routine organ transplantation, there was initial concern about rejection after a thymus transplant. However, the lack of T lymphocytes raised doubt about that concern, as well as suggested that the donor thymus would result in the development of autoreactive T lymphocytes and cause autoimmune disease. With these issues in mind, it was believed the donor thymus would require HLA-matching as is needed in BMT/HCT and as may be required in organ transplantation. Further, there was concern donor T lymphocytes carried into the patient from within the donor thymus could result in graft-versus-host disease (GVHD), which results in T lymphocytes attacking the patient as a foreign invader. An additional issue was where to place the transplanted thymus because its normal position over the heart seemed impractical.

In initial attempts at thymus transplantation, the entire donor thymus was either transplanted or ground up and injected into the patient’s abdomen. Neither of these approaches worked well. Consequently, Mary Louise Markert, MD, originated a strategy of using donor thymuses from infants undergoing heart surgery during which the thymus is removed to access the heart. With this procedure, the donor thymus needs to be at least partially HLA-matched with the patient, and treated to eliminate any passenger T lymphocytes. Then, it is cut into small strips that are inserted against the thigh muscle in the patient, allowing relatively easy access for the surgery and for a blood supply to the thymus, and the thymus tissue can be biopsied to see how well it is working. This approach has proved successful, and there are now dozens of infants with CDGS who have normal functioning immune systems.

This current method of donor thymic transplantation provided two lessons. In previous columns, we discussed the role of the thymus in the selection of T lymphocytes to provide normal immune protection. This process is based on the self-HLA components expressed in the thymus, which is why matching seemed to be a critical issue. Therefore, the first important finding is that the host’s (patient’s) fibroblast-type cells grow into the thymus, providing part of the self-HLA required for the thymic selection processes. Second, bone marrow-derived host cells also migrate to the donor thymus tissue to provide the remainder of the self-HLA needed for the selection processes. Thus, the HLA type of the donor thymus is less relevant because the thymic tissue, in essence, acts as a scaffold for the self-tissue to grow into and provide the self-HLA for the normal selection processes. Since the T-lymphocyte repertoire develops on self-HLA (from host fibroblasts and bone marrow-derived cells), autoimmunity is less of an issue. And, by depleting the thymus of donor T lymphocytes before transplantation, GVHD does not occur so normal immunity can develop.

The only major issue with this procedure is the small amount of thymus tissue that can be effectively transplanted, which is much less than a normal thymus. As a result, a bottleneck effect arises (similar to what occurs in partial DGS [PDGS]). While normal T lymphocyte development results, it takes time for the entire repertoire and full number of T lymphocytes to fill their normal niche. Similar to PDGS, by two years to three years postthymus transplantation, generally, normal numbers and function of T lymphocytes have occurred. Thanks to Dr. Markert’s pioneering approach, the way for restoration of normal immunity in DGS was implemented.

Regrettably, correction of immunity does not address the other problems in DGS (such as cardiac malformations and central nervous system issues). These still require other interventions, which we will discuss in the next issue.

Terry O. Harville, MD, PhD, is medical director of the Special Immunology Laboratory at the University of Arkansas for Medical Sciences and a consultant for immunodeficiencies, autoimmunities and transplantation.
Reducing SCIG Side Effects

By Michelle Greer, RN

For Individuals Receiving Immune Globulin (IG) therapy, the subcutaneous (SC) route of administration is often a preferred option. Many people begin SCIG with their first treatment, while others switch to SCIG after a loading dose of intravenous IG (IVIG) or after being treated with IVIG for a period of time. A primary reason for switching from IVIG to SCIG is a reduction in the incidence of systemic side effects that, for some, are intolerable. Examples of systemic side effects with IVIG include headache, nausea and blood pressure fluctuations, as well as more severe adverse reactions such as blood clots and aseptic meningitis.

With SCIG, the most commonly reported side effect is injection site reactions — swelling, redness and/or irritation — that occur at the needle insertion site and are typically localized. These reactions usually resolve within 24 to 48 hours after the infusion is completed. They are more common in the first several infusions, and their incidence normally decreases over time.

While systemic side effects occur with much less frequency with SCIG than with IVIG, in some cases, SCIG site reactions can be severe. In more severe cases, the swelling can be significant, leading to pronounced redness and increased irritation, and even pain. For the first several SCIG infusions, a nurse should train patients on all aspects of SCIG therapy, including a number of techniques discussed here to reduce the magnitude of these reactions.

SCIG Brand

There are currently several brands available for SCIG infusion (Table 1). All but one are solely IG solutions, whereas HYQVIA is a combination product. If one brand is causing site reactions and the patient is sure he or she has considered all other sources of irritation, a brand switch may be considered. Any switch should be discussed with the patient’s physician.

Needle Size

The gauge (the size of the hole in the needle) and length of the needle can be contributing factors to site reactions. SCIG needles come in 24, 26 and 27 gauges, with 24 being the largest. The larger the number of the gauge, the smaller the needle, so a larger number gauge means a thinner needle being inserted. In some cases, larger gauges are required due to the volume of drug to be administered or if a more viscous drug is required for accurate flow.

There are several layers in the skin. To ensure proper absorption of the IG, the correct needle length must be selected so that, when inserted, the needle tip is in the subcutaneous tissue and the medication is infused therein. If the needle is too short or too long, the medication will not infuse into the subcutaneous tissue.

Table 1. Subcutaneous Immune Globulin Products

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Manufacturer</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuvitru</td>
<td>Shire</td>
<td>20%</td>
</tr>
<tr>
<td>Hizentra</td>
<td>CSL Behring</td>
<td>20%</td>
</tr>
<tr>
<td>Gamunex–C</td>
<td>Grifols</td>
<td>10%</td>
</tr>
<tr>
<td>Gammagard Liquid</td>
<td>Shire</td>
<td>10%</td>
</tr>
<tr>
<td>Gammaked</td>
<td>Kedrion</td>
<td>10%</td>
</tr>
<tr>
<td>HYQVIA</td>
<td>Shire</td>
<td>10%</td>
</tr>
</tbody>
</table>
increasing the potential for a more severe reaction.

SCIG needles are available in several lengths. Based on height and weight of the patient, the correct one will be chosen for a patient upon initiation of therapy. Needle length can also be changed at any time if it’s determined inappropriate or if a patient’s weight fluctuates. This is especially important for children as they grow.

Needle Set
The subcutaneous needle is not just a needle alone; it is referred to as a needle set. The set consists of a needle, a backing that sits up against the skin and a short piece of tubing extension that attaches to the longer infusion tubing. In some cases, the material or shape of the backing may contribute to the irritation of the skin. There are many brands of these sets, so if one isn’t comfortable, there are options.

Infusion Site
It is important to choose the proper infusion site. Typical locations for SCIG injections include the abdomen, posterior upper arms and anterior thighs. However, for HYQVIA, the recommended infusion sites are upper to mid abdomen and upper thigh. HYQVIA should not be administered in the arms. Most people who self-administer SCIG do not typically select the upper arms because insertion of the needle requires two hands; however, if someone is assisting them, it is an appropriate site. SCIG should not be administered in the buttocks.

Injection sites should be at least 2 inches from the umbilicus. If multiple sites are required for infusion, the sites should be 2 inches or more apart. The skin over the insertion site should be free from scars, varicose veins, bruising and other types of skin irritation or breakdown. It’s also helpful to not choose the same insertion site over and over (although some believe that using the same site helps reactions dissipate over time).

Infusion Volume
The total volume of IG infused in relation to the number of sites is also important. A patient can choose to infuse in only one site or up to six sites. It may be better to infuse in a greater number of sites to reduce the volume infused in each site, which can decrease the chance for irritation.

Insertion Technique
Learning how to properly insert a subcutaneous needle, especially if there are multiple sites, is vital to the success of the infusion. The first step is to ensure the skin is properly cleaned. Typically, the site is cleaned with an alcohol wipe. Sufficient time should be given to allow the alcohol to dry before piercing the skin with a needle. When the tubing and needle are primed, meaning the IG is run through the tubing, care should be taken to not let even a drop of IG come through the tip of the needle. The goal is to have a “dry stick,” which means no IG is on the skin or the needle (both should be dry and sterile). This will reduce the chance of the layers of skin being irritated with alcohol or IG solution. Any allergies or sensitivities to latex or adhesives also need to be considered.

Once the needle is in place, it should be secured properly, since excessive movement can also contribute to site reactions. After the infusion is complete, the needle should be carefully removed and discarded. The sites can typically be left uncovered after removal. However, if there is any bleeding, a gauze or bandage can be applied for a short time.

Proper Technique Is Key
SCIG infusions can eliminate the many side effects that often accompany IVIG infusions. However, even with SCIG, reactions can occur. But with training and an understanding of proper techniques, successful SCIG infusions are possible.

MICHELLE GREER, RN, is senior vice president of sales for NuFACTOR Specialty Pharmacy.

Editor’s Note: This article is an updated version from the August-September 2015 issue of IG Living.
IN THE NEWS

Education
IDF Introduces New Podcast for Patients

The Immune Deficiency Foundation (IDF) has debuted a new podcast for primary immunodeficiency disease (PI) patients, with each episode featuring a special guest physician, nurse, life management expert or patient. The podcast series provides online learning opportunities, allowing people of all ages with PI to learn about managing PI from the comfort of their home. The podcast format, which includes a digital audio file made available for downloading to a computer or mobile device, supplements current IDF educational resources.

Hosted by John G. Boyle, IDF’s president and CEO, the debut podcast episode kicked off the beginning of the IDF Young Adult Online Education Series developed especially for students and/or young professionals diagnosed with PI. It features Jennifer Heimall, MD, assistant professor in the division of pediatric allergy and immunology at the University of Pennsylvania Medical School and medical director of the Day Medicine Unit at Children’s Hospital of Philadelphia, who discusses taking control of healthcare management, including advice on switching from a pediatric to adult doctor, setting aside time for treatments and more. The debut episode can be downloaded at itunes.apple.com/us/podcast/primary-immunodeficiency-q-a-an-idf-podcast/id1437167809?mt=2.

Individuals can subscribe to IDF’s new podcast to receive updates on the latest episodes as they’re released at primaryimmune.org/news/introducing-new-idf-podcast.

Medicines
FDA Approves New IVIG 10% for PI and ITP

In August, the U.S. Food and Drug Administration (FDA) approved Octapharma’s Panzyga (immune globulin [human] 10%) to treat primary humoral immunodeficiency (PI) in patients 2 years of age and older and chronic immune thrombocytopenic purpura (ITP) in adults. Panzyga comes in 10 mL, 25 mL, 50 mL, 100 mL, 200 mL and 300 mL vial sizes.

Approval for the PI indication was based on a Phase III study of 50 subjects who received Panzyga at a dose between 200 mg/kg and 800 mg/kg body weight every three or four weeks, consistent with the subject’s previous dosage regimen. Participants ranged in age from 2 years to 65 years, and the study period lasted 360 days. Infusions were initiated at a rate of 1 mg/kg/minute for the first 30 minutes, and if tolerated, could be advanced to a maximum tolerated rate not exceeding 4 mg/kg/minute. The study met its primary efficacy endpoint of 0.08 serious bacterial infections per patient per year (four infections over 50.2 patient-years).

Approval for the ITP indication was based on a Phase III study of 36 patients aged 18 years and older with chronic primary ITP. Panzyga was administered at a dose of 1 gm/kg/day for two consecutive days, and subjects were followed up for safety through day 63. The primary endpoint was platelet response rate defined as the proportion of enrolled subjects meeting eligibility criteria who demonstrated an increase in platelet count to greater than or equal to 50x10^9/L within seven days after the first infusion. Key secondary endpoints included maximum platelet count, time to platelet response, duration of response and hemostatic outcome in subjects who had bleeding at baseline. The trial met its primary endpoint with 29 of 36 enrolled subjects responding to Panzyga. Median time to response was two days, and duration to response was 14 days. Eighty percent of subjects with a response attained a normal platelet count. Mean maximum platelet count after the start of treatment for all subjects was 237x10^9/L. Overall, the primary efficacy of 81 percent compared favorably with response rates reported with approved IVIG products that range between 70 percent and 82 percent.

Panzyga will be marketed in the U.S. by Pfizer.


IN THE NEWS

Research

Study Finds CVID Patients More Fatigued with IVIG Than SCIG

Patients with common variable immunodeficiency (CVID) treated with intravenous immune globulin (IVIG) have increased fatigue compared to those treated with subcutaneous IG (SCIG), which has a significant impact on quality of life and productivity.

In the study, data were analyzed from 873 CVID patients who responded to the 2013 Immune Deficiency Foundation treatment survey. Six hundred seventy one (76.9 percent) reported fatigue, of which 400 (83.7 percent) were receiving IVIG and 271 (68.6 percent) were receiving SCIG. Dose and frequency of IG replacement therapy did not affect fatigue prevalence. However, fatigued patients on IVIG reported greater infection rates and required more antimicrobials during the wear-off period. In addition, fatigued patients reported worse health status than non-fatigued patients, and they had lower rates of employment, education, household income and school attendance than the nonfatigued counterparts.

The researchers recommend further studies to identify the mechanisms of fatigue to help advance therapeutic measures to treat CVID and improve patients’ quality of life and well-being.


SUB-Q Needles and Skin Force Penetration

What Does it Really Mean to Patients?

Studies show EMED Soft-Glide® Needle Infusion Sets provide

- Easier needle insertion
- Facilitates 90 degree insertion
- Decreased insertion pain
- Decreased removal pain
- Minimization of tissue damage

*If you would like a copy of the needle comparison report please contact sales support.
Some PI patients are at higher risk of certain forms of cancer compared with the general population, but understanding risk factors and screening appropriately can help reduce risks.

By Terry O. Harville, MD, PhD, D(ABMLI), D(ABHI)

A COMMONLY HELD concept is that when the immune system malfunctions, “immunosurveillance” (the ability of the immune system to look for infections and cells developing into cancer) declines and, thereby, the risk increases for a developing cancer to go undetected. Hence, an increased risk for cancer in patients with primary immunodeficiencies (PIs) seems logical. This article explores the risks for cancer in PI patients. (For greater depth on this subject, refer to the articles in the bibliography.)
Types of PIs and Cancer Risks

Currently, there are more than 350 known PIs, many with now-defined genetic causes. Yet, fewer than 10 PIs account for nearly all cancer diagnoses. Unfortunately, the most common form of PI, common variable immune deficiency (CVID), accounts for nearly one-quarter of cancer diagnoses.

PI can be divided into different categories. One classification is humoral and another is cellular. Humoral immunodeficiencies include complement deficiencies and antibody deficiencies. Cellular immunodeficiencies include phagocytic cells, B lymphocytes, T lymphocytes and NK cells. There are also overlaps between the categories. B lymphocyte deficiencies go along with antibody deficiencies, T and B lymphocyte-combined immunodeficiencies occur, and T and B lymphocyte immunodeficiencies may also have NK cell deficiencies. Cancer risk increases as cellular immunodeficiency increases, which is thought to be a consequence of reduced immunosurveillance. Thus, the overall rarer forms of combined immunodeficiencies may have among the highest risks for developing cancer.

The following are cancer risk findings reported from a study conducted by Resnick et al, looking at the demographics, immunologic parameters, medical complications and mortality statistics from 473 subjects with CVID who were followed over four decades in New York:

- Overall, some form of lymphoma is the most common cancer (approximately 49 percent of all cancers) in PI patients. In the study, lymphoma was diagnosed in approximately one in 12 (around 8 percent) CVID patients whose adjusted lifetime risk would be approximately one in 6 (about 16 percent). Compared to the expected rate in the general population of approximately one in 42 (2 to 3 percent), CVID patients have a five to eight times greater lifetime risk for developing some form of lymphoma.

- In many cases, Epstein-Barr virus (EBV) infection of B lymphocytes is a driving force behind the development of lymphoma because immunosurveillance doesn’t control EBV or its infected B lymphocytes. Any of the B lymphocyte and T lymphocyte immunodeficiencies increase risk for lymphoma. Indeed, it is considered that the greater the T lymphocyte immunodeficiency, the greater the risk for lymphoma. B lymphocytes reside in areas known as “Peyer’s patches” in the intestinal wall. It is common for lymphoma to originate in Peyer’s patches in the gastrointestinal (GI) tract. Thus, an inciting force may be the immune system interaction with organisms from inside the GI tract. Better stated, a malfunctioning immunity that should be tolerized to normal organisms of the GI tract may be responding in an abnormal fashion, especially since it may be underresponding to actual pathogens. This overdrive of B lymphocytes in the intestinal wall may then allow for mutations, which in turn result in lymphoma. And, overdrive is worsened if EBV infection is present.

- The second most common cancer in CVID patients in the study was breast cancer. The adjusted risk for females was approximately one in 29 (about 3 to 4 percent), and the adjusted lifetime risks for females was approximately one in 15 (about 7 percent) compared with approximately one in eight (about 12 to 13 percent) for the general population. Because the genetic risk factors for breast cancer (such as the inheritance of specific mutations in BRCA1 and BRCA2 genes) have not been well studied in PI patients, it is unknown how these may affect the risks.

- Some form of GI cancer occurred in approximately one in 79 (about 1 to 2 percent) of CVID patients in the study. Adjusted for lifetime risks, it occurs in approximately one in 40 (about 3 percent), and the incidence can be as high as approximately one in 23 (about 4 to 5 percent) in the general population.

- Melanoma was found in approximately one in 158 (about 0.6 percent) of CVID patients in the study. And, the adjusted lifetime risk was approximately one in 79 (about 1 to 2 percent), whereas the lifetime incidence in the general population may be as high as approximately one in 38 (about 2 to 3 percent).

- Approximately one in 237 (about 0.4 percent) of CVID patients developed lung cancer. Adjusted for lifetime risk, it was approximately one in 119 (about 0.8 percent). The lifetime risk in the general population is reported to be approximately one in 16 (about 6 percent).
Therefore, in CVID patients, risks for certain forms of cancer may be no greater than the general population. In contrast, higher risks for lymphoma are found, with a lifetime adjusted risk five to eight times greater than the general population. What has not been explored is whether the rates correspond to known genetic risk factors.

Other forms of PI rarer than CVID have an even higher risk for cancer. Some of these have a more severe T lymphocyte deficit, which results in poorer immunosurveillance, so that developing cancer cells go undetected. Still others such as ataxia-telangiectasia (AT) and Nijmegen breakage syndrome have abnormalities that hinder their ability to repair damaged DNA. For example, if DNA is damaged by X-rays, it cannot be appropriately repaired, allowing mutations that result in cancer.

Patients with AT are at risk for essentially any form of cancer, but GI tract cancer followed by breast cancer are the most common forms. Indeed, the cancer risks may be approximately six times that of the general population. Unfortunately, relatives of patients who may be carrying the genes responsible for disease are at an overall higher risk to develop cancer. Patients with other forms of DNA repair abnormalities have similar profiles.

As specific mutations responsible for causing different types of PI are found, there will be a better understanding of the genetic risk factors specific for cancer development in these patients.

What Do the Incidence or Occurrence Rates of Cancer in PI Really Mean?

Based on data, the risk for developing some form of cancer in CVID patients may be no greater than the general population, except for the five-to-eight-times increase in lifetime risks for the development of lymphoma. And, risks may be even higher for those with poorer T lymphocyte function. In forms of PI in which DNA repair is affected, the rates may be approximately six times the general population for any form of cancer.

What is missing, though, is information about other risk factors. We now know of many specific genetic risk factors for the development of cancer in the general population. For example, patients diagnosed with lymphoma will frequently have a panel of specific genes analyzed because they can have bearing on prognosis, specific interventions and therapies. Further, in conditions with DNA repair abnormalities, cancer risk is greater regardless of whether an immunodeficiency is present. Until we have determined the presence or lack of additional genetic risk factors, it remains difficult to fully attribute the development of cancer to only having the presence of an immunodeficiency (with lymphoma the exception).

What Can Be Done to Ameliorate the Risk of Developing Cancer?

Tobacco smoke exposure remains one of the greatest risk factors for developing many forms of cancer. Stopping smoking and avoiding exposure to cigarette smoke can be very helpful. Alcohol intake promotes GI cancer. Drinking in moderation or not imbibing in alcohol reduces these risks. Infection of the stomach with helicobacter pylori bacteria increases the risk of stomach cancer. But, undergoing treatment may reduce the risk. Unfortunately, other infectious agents may not be so readily avoided or treated. Once an EBV infection has occurred, it remains within the person’s B lymphocytes, along with the risk for developing lymphoma. Therefore, knowing whether one has EBV can be a starting point for awareness about the potential risk of developing lymphoma and for maintaining a higher vigilance for disease development.

Avoiding as best as possible events that result in radiation exposure can reduce risks for damaging DNA, which reduces cancer potential. For those with known DNA repair abnormalities, minimizing exposure to X-rays is imperative. In addition, minimizing flying at high altitudes (estimated to be equivalent to a chest X-ray exposure of radiation, or approximately one two-hundredths of the acceptable annual exposure to radiation
with each flight) can reduce some radiation exposure.

Drinking clean water that is free from impurities that promote cancer (trichloroethylene, benzene, etc.) can also decrease cancer risk. Using a water filter containing activated charcoal may be necessary to remove such items. Lastly, eating a diet with many natural antioxidants may be helpful.

**What Can Be Done to Evaluate for Cancer?**

Any changes in fatigue (energy level), temperature, achiness, lymph nodes, stool or stooling patterns, rashes, headaches, etc., could represent changes associated with cancer. An obvious problem is these signs may represent inflammation, which can be caused by an infection or autoimmunity. Therefore, appropriate judgment must be used in evaluating clinical features for distinguishing the source of the inflammation, infections, autoimmunity and/or cancer.

Blood tests may be helpful for some. Changes in white blood count, platelet count and hemoglobin/hematocrit can be useful screening tests. The serum LDH and uric acid levels may go up with lymphoma. Thus, some simple blood tests can be useful in screening for the presence of cancer.

Since GI cancer and lymphoma of the GI tract may represent nearly 60 percent of cancers found in PI patients, annual endoscopies may be quite worthwhile, especially once a patient has reached 40 years of age. Some have advocated an initial PET-CT scan as a baseline, which is repeated when there is suspicion of cancer since it does a relatively good job of cancer detection. However, caution is always necessary about the potential radiation exposure.

Routine breast and cervical examinations in women remain important screening tools.

For those with DNA repair abnormalities, using alternative testing such as magnetic resonance imaging or ultrasound can reduce radiation exposure.

Family history of cancer may be a very useful indicator of risks, since gene mutations associated with these may be different from those causing the PI. For example, a family history of breast cancer may be a good indication to check for BRCA1/BRCA2 mutations and to treat as appropriate.

As more gene mutations are identified with risks for specific cancers, these too may be evaluated. One major dilemma remains, however, that while the risks may be greater for development of cancer from specific gene mutations, there is no guarantee cancer will develop. The tests merely identify risk. For some individuals, knowing a risk is present can be psychologically difficult. Thus, individuals should be screened for cancer genetics only after appropriate counseling and acknowledgment that they can psychologically deal with the results.

**Summary**

In general, the risk for cancer in PI patients varies from the general population depending on the type of cancer and the type of PI. Overall, some form of lymphoma is the most commonly diagnosed in PI patients, with the risk in CVID patients five to eight times that of the general population over a lifetime.

Altering lifestyle issues can be helpful for reducing risks. Identifying family risks with specific gene mutations may be quite useful for assessing an individual’s risk. Any inflammatory illness should be reasonably assessed. While infection would be most highly considered, risk for cancer should not be ignored. Simple blood tests obtained at appropriate intervals may be helpful for screening. Annual endoscopies beginning at age 40 years are reasonable for assessing the GI tract. Some would recommend a baseline PET-CT scan useful as a reference for future evaluations. Other general screening, breast examination, Pap smears, etc., should be routinely performed. And, testing for gene mutations as they become identified with risks for specific cancers may be useful, but only in patients who can psychologically handle the information.

Finally, the most important thing is for PI patients to have a good working relationship with the physicians providing their care. For their part, physicians should listen to patients’ concerns and evaluate them with appropriate measures.

**TERRY O. HARVILLE, MD, PhD,** is medical director of the Special Immunology Laboratory at the University of Arkansas for Medical Sciences and a consultant for immunodeficiencies, autoimmunities and transplantation.

---

**Bibliography**


Autoimmune Encephalitis: The ‘Brain Under Attack’

Individuals afflicted with this newly described group of disorders require swift and aggressive treatment, which often isn’t possible due to misdiagnosis.

By Ronale Tucker Rhodes, MS

IN 2017, DUKE Health, a world-class academic and healthcare system, posted an article titled “Brain Under Attack.” It chronicles the four-year journey to diagnosis of a 14-year-old boy, Lucas Quinones-Reed, who began developing baffling symptoms, including trouble speaking, walking and reading, a plummeting IQ, anxiety and violence. Lucas’ parents took him to numerous hospitals on the East Coast, but because of an inability to diagnose his symptoms, he was repeatedly admitted to psychiatric wards. Fortunately for Lucas, his father, who has an advanced degree in psychology, was convinced Lucas’ symptoms were neurological rather than psychological. So, when doctors at a hospital in Washington, D.C., recommended they “go to Duke,” it was the turning point in their nightmare. After meeting with Heather Van Mater, MD, a pediatric rheumatologist, and William Gallentine, DO, a pediatric neurologist, Lucas was diagnosed with Hashimoto encephalopathy, a rare and often misdiagnosed autoimmune disorder that causes brain inflammation.1

Lucas’ story isn’t unusual. It has been told before in a book released in 2013 about a 24-year-old reporter, Susannah Cahalan, who in 2009 was struck by autoimmune encephalitis (AE), a confounding illness that ravaged her mentally and physically. Her story became a New York Times best-selling book titled Brain on Fire;2 which was made into a movie in 2016.

Yet, despite the attention these stories received, AE is still commonly misdiagnosed. The reason: It mimics so many other psychiatric disorders. And, because individuals afflicted initially present with psychiatric symptoms, an inflammatory process is not suspected. What’s more, AE generally occurs sporadically in people with no family history of the condition.3

The term “autoimmune encephalitis” appears in the medical literature in the 1970s and 1980s. The first specific AE antibody was identified in 2005 when Joseph Dalmau, MD, described the anti-NMDA-receptor encephalitis type. Since then, the field of AE has expanded rapidly with more than 15 known types of AE today, including autoantibodies directed against NMDA, LGI1, CASPR2, VGKC-complex antibodies, AMPA and GABA.4

AE’s occurrence rate is about one in 200,000 per year. However, the true incidence of these syndromes is difficult to determine because the diagnosis may not be considered, many cases go unreported or a specific viral cause is never confirmed.5 AE can affect patients of all ages, including infants and the elderly, with some types occurring more often in children and young adults. Like many autoimmune diseases, AE also occurs more frequently in women than in men, and it has been reported to be higher among African-Americans than Caucasians.6

What Is AE?
Encephalitis is inflammation (swelling) of the brain. While there are different types of encephalitis, AE is a group of neurological diseases that occur when the immune system responds to a previous infection and inadvertently damages the brain through collateral damage or through direct effect by molecular mimicry (brain tissue similar to offending
micro-organism). Damage and inflammation can also occur when resident cells (microglia and dendritic cells are activated) (also known as the secondary or postinfectious type) or when specific antibodies (immunoglobulins) present that cause the body to mistakenly attack healthy nerve cells in the brain, which disrupts synaptic processing and causes the nerve cells to no longer function properly.6,8

There are six main types of AE:9

• Acute disseminated encephalomyelitis (ADEM) accounts for approximately 10 percent of known cases. ADEM usually affects children and begins after a childhood exanthem (break out) or other viral infections and immunizations. Terminologies used to describe this include postviral, postinfectious or parainfectious. With ADEM, the white matter of the brain (that contains nerve fibers and myelin) is predominantly affected, and microscopically, there is invasion with immune cells egressing from the blood vessels that have destroyed the myelin.

When ADEM occurs in children, they may have a history of infection such as a cold, sore throat or tummy upset two weeks to four weeks before they become ill, which inappropriately activates the immune system causing inflammation of the nerve coverings, disrupting function.

• Anti-NMDAR encephalitis occurs when antibodies react with the N-methyl-D-aspartate (NMDAR) protein receptor, which may result in disruptive mood and movements.

• Hashimoto’s encephalopathy is a rare condition that can affect all age groups but typically affects females around 50 years old. Recent insight about this disorder shows it may not represent a single diagnosis, but rather a syndrome that includes a number of specific conditions. In Hashimoto’s encephalopathy, the antithyroid antibodies are thought to be the likely biomarker.

• Rasmussen encephalitis, also called Rasmussen’s syndrome, is a rare, progressive, chronic encephalitis that occurs mainly in children (mostly in 6- to 7-year-olds) but 10 percent of cases can occur in adolescents and adults. It typically strikes healthy individuals, and no more than an estimated two new cases per year are identified in large epilepsy centers.

• Limbic encephalitis is a condition in which limbic areas of the brain are inflamed, resulting in improper function. The limbic system includes the hippocampus and amygdala, which is responsible for memory, learning and emotions such as aggression. Most forms of limbic encephalitis fall into two main categories: 1) infectious encephalitis caused by direct invasion by a virus and 2) autoimmune encephalitis caused by the person’s own immune system reacting against part of the limbic system.

• LGI1/CASPR2-antibody encephalitis occurs when the immune system produces antibodies that target leucine-rich glioma inactivated 1 (LGI1) or contactin-associated protein 2 (CASPR2) in the brain. Unlike most autoimmune diseases, men are affected twice as often as women.

AE’s occurrence rate is about one in 200,000 per year.

Symptoms of AE

With AE, a wide range of neuropsychiatric symptoms can be exhibited depending on the intensity of the inflammation and the areas targeted. And, these symptoms may appear at different times and different levels of intensity. Commonly associated symptoms include:4,10

• Cognitive impairment
• Memory difficulties
• Seizures
• Ataxia
• Involuntary movements
• Slowed or loss of ability to speak
• Rapid, pressured or involuntary speech
• Behavioral changes such as agitation
• Loss of inhibition
• Hallucinations (visual or auditory)
• Paranoid thoughts
• Severe anxiety
• Sleep disruption, including severe insomnia
• Partial or complete loss of appetite for extended periods
• Food and drink tasting inedible or triggering nausea
• Excessive eating without feeling sated
• Decreased level of consciousness (to the point of unresponsiveness, catatonia or coma)
• Weakness or numbness of part of the body
• Loss of balance
• Vision changes
Signs and symptoms of AE often occur two to three weeks after the initial infection and progress rapidly over several weeks or months. In the classic presentation, there is often a distinct phase known as the prodromal stage in which the illness is developing. In AE, prodromal symptoms, if they occur, are flu-like symptoms that include headache, fever, nausea, vomiting, diarrhea or upper-respiratory tract symptoms.

Following the prodromal phase, seizures are the dominant feature seen in children, whereas in adults, psychiatric symptoms are the dominant feature. In addition, common behavioral and personality changes early on include psychosis, aggression, inappropriate sexual behaviors, panic attacks, compulsive behaviors, euphoria or fear.

Psychiatric symptoms may fluctuate in severity and duration. Cognitive impairments or abnormalities such as thinking, memory loss and, especially, the ability to retain new information may be impaired, and seizures, problems with concentration and reasoning are severe enough that they interfere with daily functioning.

Eventually, AE leads to a progressive decrease of level of consciousness that can progress to coma. All these signs and symptoms are often occurring within the first few days to several weeks of the disease appearing.11

Causes of AE

Encephalitis is usually caused by a virus (i.e., measles and rubella), but other infectious agents (including bacteria) can also be the cause. In fact, infection with many different viruses can lead to encephalitis, and AE can be caused by complications resulting from viral infection. However, in more than 50 percent of encephalitis cases, the exact cause of the illness is not tracked down.7

Some types of AE “termed postinfectious encephalitis” such as ADEM are caused by infection. Other forms of AE are associated with detecting specific antibodies (that help remove foreign antigens such as viruses and bacteria) in blood such as voltage-gated potassium channels (VGKC) complex (anti-LGI1 and Caspr2), NMDA receptor, GAD, AMPAR and GABA antibodies. The reason these antibodies are produced by the immune system in people with AE is not known in most cases, but sometimes a tumor (benign or cancerous) may generate the antibody.9

Diagnosing AE

In patients whose symptoms are consistent with AE, testing used to aid in its diagnosis has historically included MRI of the brain with contrast, electroencephalogram (EEG), blood and cerebrospinal fluid (CSF) analysis for markers (autoantibodies) of inflammation. However, because criteria for AE relied on antibody detection and response to immunotherapy, which could delay accurate diagnosis, a team of researchers published a position paper in 2016 establishing three levels of clinical evidence for AE: possible and probable for which the autoantibody status is not needed in most cases, and definite for which the autoantibody status is often needed.12

For instance, for possible AE, diagnosis can be made when all three of the following criteria have been met:

1) Subacute onset (rapid progression of less than three months) of working memory deficits (short-term memory loss), altered mental status (defined as decreased or altered level of consciousness, lethargy or personality change, or psychiatric symptoms);
2) At least one of the following:
   • New focal central nervous system findings
   • Seizures not explained by a previously known seizure disorder
   • CSF pleocytosis (elevated white blood cell count of more than five cells per mm³)
   • MRI features suggestive of encephalitis; and
3) Reasonable exclusion of alternative causes.

For probable and definite AE diagnoses, the researchers published additional criteria. According to the researchers, in these patients “diagnosis of a definite autoimmune encephalitis greatly depends on the results of autoantibody tests. By contrast, disorders exist in which the clinical syndrome and MRI findings allow for classification as probable or definite autoimmune encephalitis before the autoantibody status is known.” Diagnostic criteria for these are extensive and can be found in their position paper titled “A Clinical Approach to Diagnosis of Autoimmune Encephalitis” published in the April 1, 2016, issue of *The Lancet*.12

**Treating AE**

First-line treatment for AE includes removal of the tumor (if identified), high-dose corticosteroids (anti-inflammatory), intravenous immune globulin (IVIG) (immunomodulatory and anti-inflammatory) or plasmapheresis (removal of harmful autoantibodies). If a cell-surface or synaptic antibody has been detected and symptoms are suggestive of AE, immunotherapy is initiated in various sequences. However, if it is not known whether the cause is due to a tumor or infection, steroid therapy can complicate matters in the case of a cancerous tumor, whereas IVIG and plasmapheresis will not exacerbate the infectious condition.

If a tumor is identified, removal is essential to remove the source of the antibodies and improve the prognosis of the tumor. One study showed 50 percent of patients with a specific AE (anti-NMDAR) improved with first-line treatment and, when tumor removal was present, there was almost full recovery of 97 percent after two years.13

When a synaptic or cell-surface antibody has been detected,
first-line therapy is given aggressively and early with escalation if improvement is not satisfactory, meaning it leads to better outcomes and fewer relapses. Unfortunately, in approximately 50 percent of cases, first-line therapy fails to reverse symptoms, so second-line therapy is required. This includes rituximab, CellCept and cyclophosphamide. Rituximab is a monoclonal (which destroys B-cells that produce antibodies including harmful ones) anti-CD20 antibody given weekly for four weeks to rapidly deplete CD20/CD19 B cells from the blood to undetectable levels. Cyclophosphamide, which suppresses the immune system, is an antimetabolite used in chemotherapy regimens. CellCept is an oral immunosuppressant that interferes with the formation of DNA in certain immune system cells that become overactive in cases of autoimmune disorders.

**RECOVERY FROM AE IS DIFFERENT AND UNIQUE FOR EACH PATIENT.**

Approximately 20 percent to 50 percent of patients with AE show inadequate responses to second-line therapies. In these cases, readministration of first-line immunotherapeutic agents, extended use of second-line immunotherapy and long-term maintenance of prednisolone or steroid-sparing agents such as azathioprine and mycophenolate mofetil are options. Mycophenolate mofetil (CellCept), in particular, has better results for inducing remission and a more favorable side effect profile than cyclophosphamide in other autoimmune disorders, supporting its use as a safer alternative to cyclophosphamide. A small number of studies reported a more targeted therapy with monoclonal antibodies such as Tocilizumab or direct infusion of immune mediators such as low-dose IL-2 therapy, Treg modulation and Bortezomib.14

Patients who respond to first- and second-line therapies often recover well or at least partially, but then show acute worsening (relapse) of symptoms that mirror the initial attack but may be milder. Approximately 12 percent of patients relapse over the first two years, but patients who receive second-line treatment have the lowest rate of relapse. Relapse treatment is typically with second-line therapy, but first-line treatment may be tried first.13

Recovery from AE is different and unique for each patient. Early diagnosis with early and aggressive treatment is the best path to quicker recovery. According to studies, about half of patients with AE have substantial improvement within a month of starting treatment and continue to show improvement after getting discharged from the hospital. In addition, more than half of patients with AE will slowly have partial or complete recovery, but the average time toward recovery is about 14 months.15

**Clinical Outlook**

There are many forms of AE, which is difficult to diagnose due to its shared symptoms with other disorders. Fortunately, because earlier criteria for AE often resulted in a delay of diagnosis, researchers have developed improved diagnostic guidelines, and it is now known that early and aggressive first- and second-line treatments ensure the best outcomes.

In a 2013 study of 577 anti-NMDA-receptor AE patients, 53 percent who received immunomodulation therapy showed improvement within four weeks. Eighty-one percent of patients showed substantial or complete recovery. On average, patients continued to improve for 14 months after onset of acute AE. And, while 12 percent of patients who recovered from a first acute episode had at least one relapse in the next two years, overall mortality associated with the disease was approximately 6 percent,16 which is a hopeful outcome for those afflicted with this life-threatening disease.

**RONALE TUCKER RHODES, MS, is the editor-in-chief for IG Living magazine.**

**References**


Ronal Tucker Rhodes, MS, is the editor-in-chief for IG Living magazine.
Making a difference in Our Patients’ Lives.

Specialty Solutions in Chronic Care

- Immune Globulin
- Factor
- Infliximab

NuFACTOR is committed to exceptional customer service, product and patient safety, and secure product availability and affordability. Excellence is our standard, and we’ve earned the most respected name in homecare. Our customers know we care about them, and that makes all the difference.

NuFACTOR
Specialty Pharmacy
(800) 323-6832 • www.NuFACTOR.com

©2018 NuFactor, Inc. is the specialty pharmacy subsidiary of FFF Enterprises, Inc., the nation’s most trusted distributor of plasma products, vaccines and other biopharmaceuticals.
Discrimination and Patient Rights

Living with chronic illness has many inherent challenges. When discrimination occurs, it not only adds insult to injury, in some cases, it can put patients’ lives at risk.

By Trudie Mitschang

ANYONE DIAGNOSED with an invisible chronic illness has likely had to confront the perception that they don’t look sick. When the sentiment is expressed by family or friends, it is undoubtedly frustrating. But, when doubt about diagnosis creeps into conversations about job performance, access to care or the need for special accommodations or medical leave, the repercussions can have far more serious consequences for both chronically ill patients and their families.

According to the Chronic Disease Coalition, patient discrimination comes in many forms. At its root, discrimination is about treating someone differently because they have a particular trait. For patients, discrimination means being treated differently because of their disease or disorder. One of the most dangerous forms of discrimination against patients is often doled out by health insurance carriers. The Coalition reports cases in which insurers have attempted to force kidney patients off their plans; documented fibromyalgia and cancer patients who have had their financial assistance payments rejected; and denied care to patients with health issues such as functional neurological disorders because the insurance company did not believe their disease existed.¹

Obviously, being denied access to care is the most extreme form of patient discrimination, but more subtle forms of bias can also impact patients’ quality of life. For example, chronic disease patients may find themselves excluded from participating in certain professions and occupational activities because of their condition. One such example existed until recently: Patients with diabetes were prohibited from obtaining a commercial trucking license. In other instances, employers’ lack of sick leave protection can require chronic illness patients to make an impossible choice between the financial security of a job and their basic health needs.¹
Patient Rights Under the ADA

The Americans with Disabilities Act (ADA) was enacted by the U.S. Congress in 1990. Akin to the Civil Rights Act of 1964, the ADA is designed to protect individuals from any form of discrimination based on disability. In addition, it requires covered employers to provide “reasonable accommodations” that allow employees with disabilities to perform their jobs effectively, and it imposes accessibility requirements to address the needs of those with physical limitations.2

In 2008, the original language within certain sections of the ADA was amended to address the need for a broader interpretation of the term “disability.” The changes were needed because in its previous draft, the courts had defined what constitutes a disability so narrowly that hardly anyone could qualify. The amended language now states a disability is “any physical or mental condition that substantially limits a major life activity.”2 Under the law, what constitutes a major life activity includes basic functions such as walking, reading, bending and speaking, as well as an array of bodily functions, including the immune system, cell growth, digestive, bowel, bladder, neurological, brain, respiratory, circulatory, endocrine and reproductive functions.

As members of Congress explained, “The ADA Amendments Act rejects the high burden required [by the Supreme Court] and reiterates that Congress intends that the scope of the Americans with Disabilities Act be broad and inclusive. It is the intent of the legislation to establish a degree of functional limitation required for an impairment to constitute a disability that is consistent with what Congress originally intended.”3

In a nutshell, the ADA Amendments Act makes it easier for individuals seeking protection to establish they actually have a disability. The amended guidelines cover the following individuals:

• Employees with a physical or mental impairment that substantially limits a major life activity
• Employees with a history of impairment (One cannot be discriminated against based on a previous disability.)
• Employees whom the employer regards as disabled (This protection is applicable if the employer discriminates against an employee based on its incorrect belief that the employee has a disability.)

What Patient-Centered Discrimination Looks Like

The Patient Protection and Affordable Care Act (PPACA) was passed by the 111th Congress and signed into law by President Obama in March 2010. Often referred to as the ACA, it was designed in part to prevent health insurers from discriminating against patients with chronic or pre-existing conditions. Yet, despite progress, there are many types of discrimination the chronically ill continue to face.1

Step therapy or “fail first”: Patients are forced to try and fail cheaper treatments before being allowed to obtain the treatment prescribed by their doctors. Here is what this looks like: A doctor prescribes a specific treatment to ease a patient’s health condition symptoms, but the insurer refuses to cover the drug and instead requires the patient to try a different, cheaper option. If the cheaper option fails to ease symptoms, only then can the patient obtain the treatment originally prescribed.

Premium assistance bans: Insurance companies target patients with chronic diseases by rejecting their premium payments if they rely on financial aid from nonprofit organizations.

Co-pay assistance bans: Insurers reject coverage to patients who rely on financial aid from hospitals, nonprofits such as CancerCare or other organizations to cover their co-pays.

Nonmedical switching: Insurance companies limit prescription drug coverage to less-expensive medications, requiring patients to use a different one than prescribed or forcing them off current, effective treatments.

Effective self-advocacy begins with knowing one’s rights and understanding the laws that help define those rights.

Workplace discrimination: People with chronic conditions frequently must worry not only about their health but about their jobs since employers’ policies may be murky or unfair when it comes to sick leave or other time off. They might be made to take unreasonable tests because of their disease, or face barriers to taking their needed medications.

School-based discrimination: Students with chronic diseases may face discrimination in the types of activities they are allowed to participate in, or how and whether they’re able to access their prescribed medical treatments.
PI-Specific Concerns in the Workplace

Primary immunodeficiency diseases (PIs) and other invisible chronic conditions present a unique challenge for both employees and employers. These challenges are highlighted by statistics from a study conducted by researchers at Cornell University’s Employment and Disability Institute, which found that of the employment disability discrimination charges filed with the Equal Employment Opportunity Commission (EEOC) between 2005 and 2010, the most commonly cited conditions were invisible ones.

Despite laws in place to protect them, many individuals with invisible illnesses such as PI choose not to disclose the illness, either during the hiring process or after diagnosis. Some fear being viewed with pity or being judged “incapable,” while others assume it will affect their chances of being hired or promoted. But, experts say one of the main reasons it may be a wise decision to disclose any disability is for employees to put themselves in a position to request a reasonable accommodation. Obviously, if employees feel they can perform the essential functions of the job without accommodations, they may not want to disclose the nature of their illness.

Once time off is used, patients might be able to invoke the Family Medical Leave Act.

Here are some factors patients might consider:

• Under the ADA, employees must disclose they have a disability in order to be protected.
• Employees need to disclose only those medical conditions that require an accommodation.
• Employees do not need to disclose their disability to coworkers.
• Employees should be prepared to discuss with their employer what reasonable accommodations they need, including a modified work schedule, assistive devices and technology, or the need to sit rather than stand to perform a job.

Employees can disclose their chronic illness at any time during the hiring process. If they decide to disclose during the interview process, they should be prepared to provide examples of how they have performed job duties in the past, especially tasks related to the job for which they are applying. If they decide to wait until an offer has been extended, the ADA states the employer “cannot withdraw the job offer solely because you revealed you have a disability. Instead, the employer can withdraw the job offer only if it can show that you are unable to perform the essential functions of the job (with or without reasonable accommodation), or that you pose a significant risk of causing substantial harm to yourself or others.”

You Suspect Discrimination: Now What?

When individuals suspect an employer has denied them a job or an equal opportunity to apply for a job due to a visible or invisible disability, has refused a request for reasonable accommodation or has made illegal medical inquiries or required an illegal medical examination, they should contact the EEOC. Employees are required to file a complaint of discrimination within 180 days of the alleged offense. They may have up to 300 days to file a charge if a state or local law provides relief for discrimination on the basis of disability, but to protect their rights, it is best to contact the EEOC as soon as possible to discuss all options.

According to the EEOC, if it is determined an employee has been discriminated against, that employee is entitled to a remedy that will place him or her in the position he or she would have been in if the discrimination had never occurred. This means the employee may be entitled to hiring, back pay or reasonable accommodation. The employee may also be entitled to reimbursement for attorney’s fees.

Understanding the Family Medical Leave Act

If individuals have a chronic illness and are still able to work, there’s a good chance that between the illness and the number of medical appointments required, they will quickly use up any accrued sick or paid time off. Once time off is used, patients might be able to invoke the Family Medical Leave Act (FMLA).

FMLA applies to all public agencies, including state, local and federal employers, local education agencies (schools) and private-sector employers who employed 50 or more employees in 20 or more workweeks in the current
or preceding calendar year, including joint employers and successors of covered employers. Small businesses with a handful of employees are not required to provide FMLA benefits.

To be eligible for FMLA benefits, an employee must:
• Work for a covered employer;
• Have worked for the employer for a total of 12 months;
• Have worked at least 1,250 hours over the previous 12 months; and
• Work at a location in the United States or in any territory or possession of the United States where at least 50 employees are employed by the employer within 75 miles.

A covered employer must grant an eligible employee up to a total of 12 workweeks of unpaid leave during any 12-month period for one or more of the following reasons:
• For the birth and care of a newborn child of the employee;
• For placement with the employee of a son or daughter for adoption or foster care; and/or
• To care for a spouse, son, daughter or parent with a serious health condition.

An employer is required to maintain the employee’s group health insurance during FMLA. In addition, the employer is required to make whatever contribution to that insurance that he or she was making prior to taking leave. When the employee returns to work, he or she has rights to job restoration. Upon return from FMLA leave, an employee must be restored to the employee’s original job, or to an equivalent job with equivalent pay, benefits and other terms and conditions of employment.

Becoming One’s Own Advocate

Self-advocacy is a concept that has gained momentum in recent years. Becoming empowered to speak up for oneself, make one’s own decisions about life and treatment plans, learn how to get information and understand it, and know one’s rights and responsibilities can seem daunting at first.

Following are steps toward self-advocacy:
1) Understand how health insurance works. Many Americans don’t understand the basics of their coverage, and understandably so since health insurance is complicated. A recent survey from the Kaiser Family Foundation found more than four in 10 respondents don’t understand basic health insurance terms, and even fewer could calculate how much a patient would owe under certain hospitalization circumstances. Knowing how insurance works helps patients navigate the healthcare system with less chance of ending up with costly, unexpected medical bills.

2) Review medical bills for errors. An estimated eight in 10 medical bills contain errors that go undetected without the sharp eye of an empowered patient. Medical bills can be difficult to decipher. Patients should be sure to ask questions as they arise, even if they seem “obvious or ridiculous.”

Effective self-advocacy begins with knowing one’s rights and understanding the laws that help define those rights.

Knowing One’s Rights

Effective self-advocacy begins with knowing one’s rights and understanding the laws that help define those rights. Patients are encouraged to familiarize themselves with the ADA and the specific laws that relate to their condition. Information about the ADA can be found at www.ada.gov.

The truth is, whether engaging in discussions with policymakers, choosing to have a medical procedure, applying for a job or negotiating a special accommodation in the workplace, self-advocacy can dramatically enhance self-confidence and minimize chances patients will be subjected to unfair discrimination.

TRUDIE MITSCHANG is a contributing writer for IG Living magazine.

References
The Role of Vitamins and Minerals in Immune Deficiencies and Autoimmune Disorders

Can taking vitamin and mineral supplements benefit those with compromised and overactive immune systems? Here’s what the research shows.

By Mindy Hermann, MBA, RDN
ADMITTEDLY, VITAMINS and minerals are extremely popular in the United States. The 2017 Council for Responsible Nutrition Annual Survey on Dietary Supplements shows a majority of American adults takes supplements and three-quarters report taking a vitamin and mineral supplement at least once in the prior year.

The benefits of vitamin and mineral supplements, however, are being challenged. A widely publicized systematic review in the May 28, 2018, issue of the Journal of the American College of Cardiology concluded multivitamin supplements, as well as single supplements of vitamin D, calcium or vitamin C alone, did not help prevent heart disease, heart attack, stroke or death at a young age. But, they did not cause harm either. Numerous other vitamin and mineral supplements likewise had no positive or negative effects, with the exception of folic acid (positive) and niacin and antioxidants (potentially negative).

Because certain vitamins and minerals are required for a healthy immune system and deficiencies of these nutrients can weaken the immune response, is it possible vitamins and minerals can help people with immunodeficiency diseases and autoimmune disorders?

Several Vitamins and Minerals Support Everyday Immune Health

Vitamin A and compounds related to vitamin A take part in both innate and adaptive immunity. This vitamin helps protect the health of cells in the skin, eye, lungs, gastrointestinal tract and urinary tract. They also help block infections. In addition, vitamin A is required for healthy function of natural killer cells, macrophages and neutrophils that are part of the body’s innate response. On an adaptive level, T and B lymphocytes and the body’s antibody response need vitamin A.

People who have a vitamin A deficiency are more likely to contract infections that affect the eye and respiratory, urinary and gastrointestinal tracts since the cells in these locations rely on vitamin A for normal function. Deficiency also affects the functioning of B and T cells.

Since vitamin A is a fat-soluble vitamin, it is stored in the body and can be toxic in high doses, so supplementation generally is not recommended unless a deficiency has been proven.

Vitamin B6 takes part in biochemical reactions related to protein amino acid production and immune system functioning. Deficiency of this vitamin adversely affects the immune system, and correction of a deficiency helps restore affected functions.

Vitamin C functions as an antioxidant that protects cells from damage by immune system activity against harmful bacteria and viruses. It stimulates production of several types of white blood cells, and it builds up in these cells to help them withstand damage caused by reactive forms of oxygen that form when the body fights off pathogens.

Vitamin D, in the form of 1,25-dihydroxyvitamin D3, helps to regulate several types of cells in the immune system, including monocytes, macrophages, dendritic cells and activated T cells, and it helps prevent autoimmune responses. It also protects against infection by helping to regulate proteins that kill harmful bacteria. Adequate vitamin D intake through diet and exposure to sunlight is thought to help prevent and treat autoimmune diseases such as insulin-dependent diabetes, multiple sclerosis, systemic lupus erythematosus and rheumatoid arthritis. In studies, people with low blood levels of a form of vitamin D show increased disease activity. Adequate vitamin D intake through food and supplements is recommended for overall health, bone strength and other health benefits.

Vitamin E is an antioxidant that protects cells from attack by highly reactive compounds in the body. Deficiency affects immunity, and supplementation may help protect against infections.

Selenium, a mineral, is a component of several enzyme reactions related to normal immune functions. One reaction, for example, neutralizes potentially damaging oxygen compounds that can affect immune response and can also increase the risk of cancer. Selenium deficiency adversely affects innate and adaptive immunity and can lead to more severe reactions to viral infections. Low selenium levels have been associated with autoimmune thyroid diseases such as Graves’ and Hashimoto’s. A selenium supplement may help improve immune response in individuals who are deficient in the mineral.

The Internet offers plenty of advice on vitamins and minerals for immune health, but much less science to back it up.
Zinc, a mineral, aids the development and function of immune system cells. It is not stored in the body and must be supplied regularly in the diet. Zinc deficiency affects the immune system in many ways, including reducing immune cell production and activity.

Studies on Supplementation for Immune Deficiency Are Limited

The Internet offers plenty of advice on vitamins and minerals for immune health, but much less science to back it up. The most promising studies pertain to vitamin D and selenium.

Vitamin D:
• Low vitamin D levels are associated with several autoimmune diseases, including rheumatoid arthritis, systemic lupus erythematosus, systemic sclerosis, type 1 diabetes mellitus, multiple sclerosis, inflammatory bowel diseases, autoimmune thyroid diseases (i.e., Hashimoto’s thyroiditis and Graves’ disease) and autoimmune gastritis. Data are inconclusive, however, regarding the role of vitamin D in autoimmune thyroid diseases. Additional studies are needed to show a relationship between vitamin D and the cause, prevention or treatment of autoimmune thyroid diseases.¹
  • The optimal blood concentration of vitamin D to prevent or treat autoimmune diseases is being evaluated. Experimental studies suggest vitamin D supplementation could reduce the severity of the diseases.²
  • A review of studies on vitamin D and systemic lupus erythematosus shows while vitamin D insufficiency is common, vitamin D levels do not correlate with disease activity, and benefits of supplementation are not clear.³
  • The role of vitamin D in preventing and treating rheumatoid arthritis is not clear.⁴
  • It has been suggested low vitamin D levels might be caused by autoimmune disease, and supplementation could make symptoms worse rather than better.

Selenium:
• Results from studies looking at selenium supplementation for thyroid diseases have been inconclusive and inconsistent, without evidence of a benefit for autoimmune thyroid disease.⁵

---

Table 1. Dietary Guidelines for Americans, Recommended Amounts of Food from Each Food Group, 2,000 Calories/Day

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Healthy U.S.-Style Eating Pattern</th>
<th>Healthy Mediterranean-Style Eating Pattern</th>
<th>Healthy Vegetarian Eating Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables</td>
<td>2½ c-eq/day</td>
<td>2½ c-eq/day</td>
<td>2½ c-eq/day</td>
</tr>
<tr>
<td>Dark green</td>
<td>1 ½ c-eq/week</td>
<td>1 ½ c-eq/week</td>
<td>1 ½ c-eq/week</td>
</tr>
<tr>
<td>Red and orange</td>
<td>5 ½ c-eq/week</td>
<td>5 ½ c-eq/week</td>
<td>5 ½ c-eq/week</td>
</tr>
<tr>
<td>Legumes (dry peas, beans)</td>
<td>1 ½ c-eq/week</td>
<td>1 ½ c-eq/week</td>
<td>1 ½ c-eq/week</td>
</tr>
<tr>
<td>Starchy</td>
<td>5 c-eq/week</td>
<td>5 c-eq/week</td>
<td>5 c-eq/week</td>
</tr>
<tr>
<td>Other</td>
<td>4 c-eq/week</td>
<td>4 c-eq/week</td>
<td>4 c-eq/week</td>
</tr>
<tr>
<td>Fruits</td>
<td>2 c-eq/day</td>
<td>2 ½ c-eq/day</td>
<td>2 c-eq/day</td>
</tr>
<tr>
<td>Grains</td>
<td>6 oz-eq/day</td>
<td>6 oz-eq/day</td>
<td>6 ½ oz-eq/day</td>
</tr>
<tr>
<td>Whole</td>
<td>3 oz-eq/day</td>
<td>3 oz-eq/day</td>
<td>3 ½ oz-eq/day</td>
</tr>
<tr>
<td>Refined</td>
<td>3 oz-eq/day</td>
<td>3 oz-eq/day</td>
<td>3 oz-eq/day</td>
</tr>
<tr>
<td>Dairy</td>
<td>3 c-eq/day</td>
<td>2 c-eq/day</td>
<td>3 c-eq/day</td>
</tr>
<tr>
<td>Protein Foods</td>
<td>5 ½ oz-eq/day</td>
<td>6 ½ oz-eq/day</td>
<td>3 ½ oz-eq/day</td>
</tr>
<tr>
<td>Seafood</td>
<td>8 oz-eq/week</td>
<td>16 oz-eq/week</td>
<td>Eggs 3 oz-eq/week</td>
</tr>
<tr>
<td>Meat, poultry, eggs</td>
<td>26 oz-eq/week</td>
<td>26 oz-eq/week</td>
<td>Legumes 6 oz-eq/week</td>
</tr>
<tr>
<td>Nuts, seeds, soy products</td>
<td>5 oz-eq/week</td>
<td>5 oz-eq/week</td>
<td>Soy products 8 oz-eq/week</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nuts, seeds 7 oz-eq/week</td>
</tr>
<tr>
<td>Oils</td>
<td>27 g</td>
<td>27 g</td>
<td>27 g</td>
</tr>
</tbody>
</table>

(The terms c-eq and oz-eq refer to cup- and ounce-equivalents; these incorporate foods that can substitute for each other in different amounts.)
inflammation. While the benefits of routine supplementation have not been proven, correction of a selenium deficiency may benefit the treatment of autoimmune thyroid diseases.

- In groups of individuals with autoimmune thyroid diseases, supplementation with selenium plus myo-inositol, a vitamin-like compound, improved thyroid function after six months of treatment.
- Selenium supplementation in study subjects with chronic autoimmune thyroiditis reduced thyroid autoantibody levels, but benefits for alleviating symptoms and treating the disease are not known.

Lack of Evidence for Supplementation Means a Sensible Diet Is Best

Research has not yet identified a clear relationship between key vitamins and minerals and the cause, prevention and treatment of autoimmune diseases. For this reason, a sensible diet is more advisable than supplementation, particularly of vitamins and minerals that may also pose a health risk. The Dietary Guidelines for Americans 2015-2020, coordinated by the U.S. Department of Agriculture and U.S. Department of Health and Human Services, suggests dietary patterns that are associated with health and can be customized based on calories and food preferences. These include foods rich in vitamins and minerals that help support the immune system:

- Vitamin A: liver, milk, eggs, leafy greens, carrots and other orange and red-orange vegetables, tomato products
- Vitamin B6: fish, beef liver and other organ meats, potatoes and other starchy vegetables, fortified breakfast cereals
- Vitamin C: citrus fruits and their juices, bell peppers, kiwifruit, broccoli, potatoes, tomatoes
- Vitamin D: higher-fat fish such as salmon, trout and swordfish; fortified dairy products; fortified breakfast cereals; eggs
- Vitamin E: vegetable oils, nuts and seeds, leafy greens, broccoli
- Selenium: Brazil nuts, fish and seafood, organ meats, poultry, grains, eggs
- Zinc: red meat, poultry, seafood, fortified breakfast cereals, beans, nuts, whole grains

The sample diet patterns in the Dietary Guidelines for Americans (Table 1) list recommended amounts from each food group in terms of daily and weekly totals. Following one of the recommended patterns and choosing a variety of foods from each category will provide adequate amounts of nutrients important to immune and overall health.

MINDY HERMANN, MBA, RDN, is a food and nutrition writer and communications consultant in metropolitan New York.

References
Subcutaneous Immune Globulin Maintenance Therapy for CIDP:  
An Idea Whose Time Has Come

By Keith Berman, MPH, MBA

MOST OFTEN DIAGNOSED in people between 40 years and 60 years of age, chronic inflammatory demyelinating polyneuropathy (CIDP) is a relatively rare immune-mediated peripheral nervous system disorder that results in variable loss of grip strength and upper and lower limb weakness. Patients may find themselves unable to get up from a sitting position, maintain balance or handle small or delicate items. If left untreated, irreversible axonal damage can occur, with cumulative disability that eventually leads to wheelchair dependence in about one-third of patients.

While its exact mechanism of action remains unclear, intravenous immune globulin (IVIG) has consistently been shown in well-designed clinical trials to be effective in durably reducing disability in roughly one-half of affected patients. As maintenance therapy to prevent disease relapse, IVIG is preferred.
over corticosteroids, plasma exchange or immunosuppressive drug options.

But the benefits of long-term IVIG administration often come with significant downsides. Even after employing available strategies such as slowing the infusion rate or switching product brands, some patients suffer systemic reactions that can include headache, fatigue, fever, chills, hypotension, tachycardia, myalgia, lower-back pain, rash, flushing, nausea and vomiting. Particularly in patients with predisposing risk factors, IVIG administration has also been associated with serious systemic adverse events, including renal insufficiency and, in rare instances, thrombosis or anaphylactoid reactions. In the clinic or home setting, IVIG must be infused by a specially trained nurse, and the patient must adhere to a set scheduled infusion regimen.

As documented in several recent pivotal clinical trials, a potential solution for CIDP patients with these IVIG-related issues is the same one that works for many primary humoral immunodeficiency (PI) patients who require IgG replacement therapy: self-administered subcutaneous immune globulin (SCIG).

A recent investigation randomized 30 CIDP patient responders to IVIG for a switch to a corresponding total dose of SCIG administered thrice-weekly at home or to thrice-weekly subcutaneous saline. The SCIG group experienced a modest 5.5 percent mean improvement in isokinetic muscle strength, versus a 14.4 percent mean decline in the placebo group.4 More recently, a meta-analysis of eight studies comparing the efficacy and safety of IVIG and SCIG in patients with CIDP or multifocal motor neuropathy (MMN), another chronic inflammatory demyelinating neuropathy, found no significant differences in muscle strength outcome; SCIG therapy was associated with a significantly reduced risk of moderate and/or systemic side effects.*

In March 2018, based on results from the double-blind, placebo-controlled Phase 3 PATH trial,5 CSL Behring’s 20% SCIG product (Hizentra), approved in 2010 for the treatment of PI, became the first to secure an additional indication for the treatment of adults with CIDP as maintenance therapy to prevent relapse of neuromuscular disability and impairment. Another SCIG product already approved for PI, Shire’s HyQvia, is currently being investigated for use as CIDP maintenance treatment. By all accounts, SCIG is already gaining popularity among patients and physicians as the IgG maintenance treatment of choice.

Division SCIG Doses Reduce Systemic Reactions

Following a typical 2 gram per kilogram (g/kg) induction dose of IVIG, most responders receive maintenance therapy infusions of greater than or equal to 1 g/kg of body weight every three to four weeks,* under the management of a nurse infusion specialist in the home or in the clinic setting. IVIG administration results in immediate (within six hours) or delayed systemic adverse reactions in

*A potential solution for CIDP patients with these IVIG-related issues is the same one that works for many primary humoral immunodeficiency patients who require IgG replacement therapy: self-administered subcutaneous immune globulin.

* Some CIDP patients may require IVIG infusions as often as every two weeks or as infrequently as every eight weeks.
roughly 5 percent to 15 percent of infusions, affecting as many as 20 percent to 40 percent of all patients. By contrast, across five case series evaluating SCIG in PI patients, the reported rates of systemic adverse reactions ranged between zero and less than 1 percent. The largest of these studies, monitoring 33,168 SCIG infusions in 158 patients, documented a systemic adverse reaction rate of just 0.3 percent: 100 mild and six moderate events in 28 patients with no severe or anaphylactoid reactions.

“Patients on SCIG therapy experience far fewer systemic side effects such as headache, nausea, chills and fatigue because the IgG is administered subcutaneously in frequent, much smaller doses than IVIG,” explained Vaughan. While local swelling, itching, heat, pain and erythema reactions at the SCIG infusion site are common, they generally resolve within 12 hours to 24 hours without treatment and tend to diminish over time. These typically mild local reactions are rare with IVIG infusion.

SCIG therapy delivers a similar quantity of IgG as IVIG over the same three- or four-week period, but the peak serum IgG level is much reduced by dividing the IVIG dose into one or more doses a week; a common twice-weekly SCIG infusion schedule, for example, divides a monthly IVIG dose into eight much smaller doses. The serum IgG peak following each of these small subcutaneous infusions is additionally moderated by its relatively slow absorption into the bloodstream. Because the large IgG protein is unable to cross capillary endothelial walls to directly enter the circulation, it instead slowly transits through the lymphatic system. The serum IgG level peaks between 48 hours and 72 hours following an SCIG infusion.

A combination of small divided doses and slow absorption appears also to diminish the severity of the infrequent systemic events that occur with SCIG. Danish investigators recently examined two of the most common side effects of IVIG — headache and nausea — in 59 patients diagnosed with CIDP, MMN or post-polio syndrome treated with IVIG, and 27 CIDP and MMN patients treated with SCIG. Patients reported symptom severity on a visual analog scale (VAS) from 0 mm to 100 mm. In the SCIG group, headache reached a median peak value of just 1 (range 0 to 13) mm at day six, versus a median peak value of 11 (range 0 to 96) in the IVIG group at day four. Nausea experience in the SCIG group had a stable median value of 0 (range 0 to 21) at all days, compared to a peak value of 3 (range 0 to 90) reached at day four in the IVIG group. For both headache and nausea, this reduced median severity favoring SCIG was highly significant (p < 0.0001). Just as important, the peak severity experienced by any patient was also sharply lower in the SCIG group.

A Better Alternative to Ports or Catheters

A small percentage of CIDP patients prescribed maintenance IVIG therapy either have pre-existing venous access problems or develop them with repeated peripheral intravenous access. Permanent indwelling venous catheters or infusion ports implanted under the skin were once a very popular means to resolve this venous access problem.

Intravenous and Subcutaneous Immune Globulin Products Approved for CIDP or in Clinical Testing

<table>
<thead>
<tr>
<th>Product</th>
<th>Delivery Form(s)</th>
<th>Indication</th>
<th>Approval/Study Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAMUNEX- C Immune Globulin Injection (Human), 10%</td>
<td>IV SC</td>
<td>Treatment of CIDP to improve neuromuscular disability and impairment and for maintenance therapy to prevent relapse [IV administration form only]</td>
<td>Approved September 2008</td>
</tr>
<tr>
<td>Privigen Immune Globulin Intravenous (Human), 10%</td>
<td>IV</td>
<td>Treatment of adults with CIDP to improve neuromuscular disability and impairment</td>
<td>Approved September 2017</td>
</tr>
<tr>
<td>Hizentra Immune Globulin Subcutaneous (Human), 20% Liquid</td>
<td>SC</td>
<td>Treatment of adult patients with CIDP as maintenance therapy to prevent relapse of neuromuscular disability and impairment</td>
<td>Approved March 2018</td>
</tr>
<tr>
<td>GAMMAGARD LIQUID Immune Globulin Infusion (Human), 10%</td>
<td>IV SC</td>
<td>Treatment of CIDP [IV administration form only]</td>
<td>Phase 3 clinical testing</td>
</tr>
<tr>
<td>HyQvia Immune Globulin Infusion (Human) 10% with Recombinant Human Hyaluronidase</td>
<td>SC</td>
<td>Maintenance therapy to prevent relapse of CIDP</td>
<td>Phase 3 clinical testing</td>
</tr>
</tbody>
</table>

1 IV = intravenous; SC = subcutaneous
2 GAMMAGARD LIQUID (administered intravenously) is also indicated as a maintenance therapy to improve muscle strength and disability in adult patients with multifocal motor neuropathy (MMN).
Unfortunately, these venous access devices inherently present a significant risk of infection. Localized tissue reaction produced by these devices makes it easier for bacteria and other microorganisms to become established and develop into an active infection. Some types of infections, in particular colonization with Candida albicans, frequently require removal of the port or catheter. Skin bacteria can also gain entry to the port through the needle puncture site, then travel down the catheter lumen to the vein, potentially causing a systemic infection.

A second significant concern is the potential for ports or indwelling catheters to promote thrombus formation, amplifying the risk of a thromboembolic event rarely associated with administration of IVIG itself.\textsuperscript{19}

**Reduced Wearing-Off Effect**

Exogenous IgG therapy is known to be effective only as long as the supplemental IgG serum level is maintained in the therapeutic range. Some patient responders on maintenance IVIG therapy experience a diminution in muscle strength over the days immediately preceding their upcoming scheduled IVIG infusion. This “wearing off” effect is attributable to a drop-off in serum IgG to below the therapeutic threshold level prior to the next scheduled IVIG infusion — a phenomenon that is averted by frequent IgG dosing used by patients on SCIG therapy.

In a recent crossover study, one-quarter of subjects who reported a preference for SCIG cited the advantage of less fluctuation in muscular strength than they experienced on IVIG therapy. This is unsurprising as small, frequent SCIG doses result in a more consistent serum IgG level, in particular a higher IgG trough level than the trough level shortly prior to the next IVIG infusion (Figure). While the problem of waning muscle strength in the days prior to the next IVIG infusion can also be addressed by increasing the IVIG dose or reducing the interval between IVIG infusions, both of these strategies have downsides that can be averted by switching to SCIG therapy.

**Customizing the SCIG Infusion Regimen Is Key**

Whether the product is IVIG or SCIG, CIDP patients on maintenance therapy are typically prescribed a total dose of at least 1 g/kg of IgG every three to four weeks. Thus, an 80 kilogram adult prescribed 1 g/kg of 20% SCIG product each four weeks must use an infusion pump to self-administer a total of 400 mL of fluid under the skin over that period. Prescribing instructions for Hizentra specify that, as tolerated, up to a maximum of 50 mL may be infused in each site (abdomen, thigh, upper arm or side of upper leg/hip). In a given session, patients can concurrently infuse their product through up to eight needles placed in different areas of the body. So, in theory, a patient able to tolerate 50 mL in a single infusion site could self-administer 100 mL in just one session each week using just two needles placed in two separate sites on the body. But for most CIDP patients, the maximum tolerated single-site infused volume is much lower than 50 mL.

To meet their prescribed weekly SCIG volume, patients face a choice: They can elect either to 1) increase the number of needles and sites they use in each infusion session, or 2) use fewer
Important Safety Information

WARNING: Thrombosis (blood clots) can occur with immune globulin products, including Hizentra. Risk factors can include: advanced age, prolonged immobilization, a history of blood clotting or hyperviscosity (blood thickness), use of estrogens, installed vascular catheters, and cardiovascular risk factors.

If you are at high risk of blood clots, your doctor will prescribe Hizentra at the minimum dose and infusion rate practicable and will monitor for signs of clotting events and hyperviscosity. Always drink sufficient fluids before infusing Hizentra.

See your doctor for a full explanation, and the full prescribing information for complete boxed warning.

Hizentra is a prescription medicine used to treat:

- Primary immune deficiency (PI) in patients 2 years and older
- Chronic inflammatory demyelinating polyneuropathy (CIDP) in adults

Treatment with Hizentra might not be possible if your doctor determines you have hyperprolinemia (too much proline in the blood), or are IgA-deficient with antibodies to IgA and a history of hypersensitivity.

Tell your doctor if you have previously had a severe allergic reaction (including anaphylaxis) to the administration of human immune globulin. Tell your doctor right away or go to the emergency room if you have hives, trouble breathing, wheezing, dizziness, or fainting. These could be signs of a bad allergic reaction.

Inform your doctor of any medications you are taking, as well as any medical conditions you may have had, especially if you have a history of diseases related to the heart or blood vessels, or have been immobile for some time. Inform your physician if you are pregnant or nursing, or plan to become pregnant.

Infuse Hizentra under your skin only; do not inject into a blood vessel. Self-administer Hizentra only after having been taught to do so by your doctor or other healthcare professional, and having received dosing instructions for treating your condition.

*Ig=immunoglobulin

Hizentra is manufactured by CSL Behring AG and distributed by CSL Behring LLC. Hizentra® is a registered trademark of CSL Behring AG. Biotherapies for Life® is a registered trademark of CSL Behring LLC. IgIQ®, Premier Start®, and CSL Behring Assurance® are service marks of CSL Behring LLC.

©2018 CSL Behring LLC 1020 First Avenue, PO Box 61501, King of Prussia, PA 19406-0901 USA www.CSLBehring.com www.Hizentra.com HIZ-0605-AUG18
Immediately report to your physician any of the following symptoms, which could be signs of serious adverse reactions to Hizentra:

- Reduced urination, sudden weight gain, or swelling in your legs (possible signs of a kidney problem).
- Pain and/or swelling or discoloration of an arm or leg, unexplained shortness of breath, chest pain or discomfort that worsens on deep breathing, unexplained rapid pulse, or numbness/weakness on one side of the body (possible signs of a blood clot).
- Bad headache with nausea; vomiting; stiff neck; fever; and sensitivity to light (possible signs of meningitis).
- Brown or red urine; rapid heart rate; yellowing of the skin or eyes; chest pains or breathing trouble; fever over 100°F (possible symptoms of other conditions that require prompt treatment).

Hizentra is made from human blood. The risk of transmission of infectious agents, including viruses and, theoretically, the Creutzfeldt-Jakob disease (CJD) agent and its variant (vCJD), cannot be completely eliminated.

The most common side effects in the clinical trials for Hizentra include redness, swelling, itching, and/or bruising at the infusion site; headache; chest, joint or back pain; diarrhea; tiredness; cough; rash; itching; fever, nausea, and vomiting. These are not the only side effects possible.

Before receiving any vaccine, tell immunizing physician if you have had recent therapy with Hizentra, as effectiveness of the vaccine could be compromised.

Please see brief summary of full prescribing information for Hizentra on adjacent page. For full prescribing information, including boxed warning and patient product information, please visit Hizentra.com.

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch, or call 1-800-FDA-1088.
HIZENTRA®, Immune Globulin Subcutaneous (Human), 20% Liquid
Initial U.S. Approval: 2010

BRIEF SUMMARY OF PRESCRIBING INFORMATION
These highlights do not include all the information needed to use HIZENTRA safely and effectively. See full prescribing information for HIZENTRA.

WARNING: THROMBOSIS
See full prescribing information for complete boxed warning.

- Thrombosis may occur with immune globulin products, including HIZENTRA.
  Risk factors may include: advanced age, prolonged immobilization, hypercoagulable conditions, history of venous or arterial thrombosis, use of estrogens, indwelling vascular catheters, hyperviscosity, and cardiovascular risk factors.
- For patients at risk of thrombosis, administer HIZENTRA at the minimum dose and infusion rate practicable. Ensure adequate hydration in patients before administration. Monitor for signs and symptoms of thrombosis and assess blood viscosity in patients at risk for hyperviscosity.

INDICATIONS AND USAGE
- Treatment of primary immunodeficiency (PI) in adults and pediatric patients 2 years and older.
- Maintenance therapy in adults with chronic inflammatory demyelinating polyneuropathy (CIDP) to prevent relapse of neuromuscular disability and impairment.

CONTRAINDICATIONS
- Anaphylactic or severe systemic reaction to human immune globulin or components of HIZENTRA, such as polysorbate 80
- Hyperprolinemia (type I or II) (HIZENTRA contains the stabilizer L-proline)
- IgA-deficient patients with antibodies against IgA and a history of hypersensitivity

WARNINGS AND PRECAUTIONS
- IgA-deficient patients with anti-IgA antibodies are at greater risk of severe hypersensitivity and anaphylactic reactions.
- Thrombosis may occur following treatment with immune globulin products, including HIZENTRA.
- Aseptic meningitis syndrome has been reported with IGIV or IGSC, including HIZENTRA treatment.
- Monitor renal function, including blood urea nitrogen, serum creatinine, and urine output in patients at risk of acute renal failure.
- Monitor for clinical signs and symptoms of hemolysis.
- Monitor for pulmonary adverse reactions (transfusion-related acute lung injury [TRALI])
- HIZENTRA is made from human plasma and may contain infectious agents, e.g., viruses, the variant Creutzfeldt-Jakob disease (vCJD) agent and, theoretically, the Creutzfeldt-Jakob disease (CJD) agent.

ADVERSE REACTIONS
The most common adverse reactions observed in ≥5% of study subjects were local infusion site reactions, headache, diarrhea, fatigue, back pain, nausea, pain in extremity, cough, upper respiratory tract infection, rash, pruritus, vomiting, abdominal pain (upper), migraine, arthralgia, pain, fall and nasopharyngitis.

To report SUSPECTED ADVERSE REACTIONS, contact CSL Behring Pharmacovigilance at 1-866-915-6958 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

DRUG INTERACTIONS
The passive transfer of antibodies may interfere with the response to live virus vaccines, and lead to misinterpretation of the results of serological testing.

Based on March 2018 revision
For many patients, SCIG is also valued for the freedom it offers to self-treat on their own schedule, or for independence from reliance on nurses and other medical professionals.

Independence and Scheduling Flexibility

While relief from systemic side effects is an important reason patients cite for switching from IVIG to SCIG, for many patients, SCIG is also valued for the freedom it offers to self-treat on their own schedule, or for independence from reliance on nurses and other medical professionals. This has been documented in multiple PI patient studies, including a seminal 2006 investigation of the impact of SCIG on health-related quality of life (HRQoL) in 28 PI patients previously treated with IVIG in a clinic setting (group A) and 16 others previously on IVIG therapy at home (group B). After switching to SCIG therapy, group A reported significantly less limitation in their work and daily activities, better general health and improved treatment satisfaction; more than 80 percent preferred the subcutaneous route, and 90 percent preferred the home treatment setting. Two-thirds of group B patients treated at home with IVIG followed by SCIG stated their preference for the subcutaneous route.

Results from a more recent IVIG-versus-SCIG preference study in a CIDP patient cohort echo the PI study findings. Twenty of 29 CIDP patients who crossed over from efficacious IVIG to SCIG stated their preference for the subcutaneous route. But the experience of the PI population might provide some insight about the prospects for SCIG as maintenance therapy for CIDP: Little more than a decade after the 2006 approval of the first SCIG treatment, SCIG is now the IgG replacement therapy of choice for more than one-half of PI patients in the United States.

References

Trudie: When were you diagnosed with CVID?

Jessica: I was diagnosed with CVID at the age of 13. Before I tell you how I came to be diagnosed with CVID, it is worth noting the average years between onset of symptoms and diagnosis is nine years. This is not necessarily due to misdiagnosis, but because CVID sometimes takes a while to present itself. Thanks to my doctors, I was diagnosed and began antibody treatment much earlier than the average age of diagnosis.

Trudie: What were your symptoms?

Jessica: The first physical signs of having an immune system defect arose at the age of 2 when several large lymph nodes were identified in my neck. After ruling out possible causes such as mononucleosis and other infections, it was decided to remove the largest node when I was 4. I was diagnosed with immune thrombocytopenia (ITP) before the surgery because my platelets were at 12 microliters (normal is 150 to 400 microliters). From age 4 to age 10, I took a combination of high-dose steroids and a continued low-maintenance dose to stabilize my platelet counts. During that same time, I was treated with antibiotics for 23 diagnosed ear or sinus infections. I had tubes put in my ears at age 8. I also had chronic sinusitis at the same time.

Trudie: Were you initially misdiagnosed?

Jessica: My immunologist first tested me for CVID at age 6 with the vaccine challenge that involves testing four weeks after getting the pneumococcal, DTP (diphtheria, tetanus and pertussis) and HIB (Haemophilus influenzae type B) vaccines. Tests revealed I had protective titers to all of the vaccines but almost no titers to the pneumococcal vaccine, and my immunoglobulin (IgG) levels were continuing to decline, but couldn’t conclude if they were artificially reduced by the steroids. Six months later, after suspending steroid use, I was retested for the pneumococcal vaccine response and IgG levels, and the pneumococcal titers had an improved response and my IgG levels increased. At that time, CVID couldn’t be conclusively diagnosed.

Trudie: What finally led to a diagnosis?

Jessica: I continued to take steroids until age 10 to maintain adequate platelets, but due to concerns over long-term steroid use, I was treated with three doses of Rituxan. For the next two years, my ITP was in remission, and I had limited ear infections. But, then, at age 12, I proceeded to have ear and sinus infections almost every month. I returned to my immunologist to investigate further, and testing indicated a very low IgG level and almost non-existent IgA level, as well as undetectable vaccine titers. CVID was then the official diagnosis.

Trudie: What was your initial treatment plan?

Jessica: I was started on intravenous immune globulin (IVIG) infusions once a month in the hospital for the next 18 months. After starting infusions, the occurrence of ear and sinus infections dramatically declined.
Jessica: I transitioned when I was 14 to SCIG. I have been treated with SCIG at home for the past two and a half years. I started high school during my second year of IVIG at the hospital, and I had to miss a whole day of school each month. I experienced scarring in my veins from the frequent IVs (plus blood draws). I did not want to have to get a port to prevent future vein scarring. It was hard to make up the work and miss the lectures in the classroom. Additionally, I hadn’t yet told many people about my diagnosis, so I had to make excuses or avoid the questions from kids at school about why I was out of school again and why I had bruises on my arms. It is much more comfortable and flexible to do my infusions at home and on my own time.

Trudie: What do you wish people understood about your illness?
Jessica: Chronic fatigue has a large impact on my daily life and makes it hard to focus in school. I need 10-plus hours of sleep every night to feel awake. Also, I work very hard to get the grades I do considering the impact fatigue has on my life. I’m in the top 12 percent of my class and will graduate with honors in STEM, National Honors Society and a score of 1400 on my SAT.

Trudie: Where does dance fit into your life?
Jessica: I have been dancing for 14 years, eight competitively. Until this past year, I have danced ballet (pointe), jazz, hip hop and lyrical; however, this year, I will continue pointe and tap. I am also a teaching assistant with one of the younger ballet classes. I cannot entirely keep my illness from interfering with dancing, but I do my best to work around it. I always inform my dance teachers of days I will be missing and why, and they understand I may not be able to come to class because I am not feeling well.

Trudie: What are your goals for the future?
Jessica: I want to go to school to become either a clinical pharmacist specializing in immunology or an immunologist. I also want to continue with PI advocacy work.

Trudie: What type of advocacy do you do?
Jessica: Participating in Immune Deficiency Foundation Advocacy Day really opened my eyes, especially on legislative issues that may impact those dealing with a rare and chronic disease. I am a plasma awareness coordinator and visit a few local plasma donation centers. Plasma cannot be manufactured in a lab, so thanking the donors for their lifesaving donations is very important. My favorite volunteer role is being a member of the Teen Council where I attend Teen Escapes and other events and help mentor youth living with chronic illness.

Trudie: What advice do you have for other teens living with chronic illness?
Jessica: Don’t force yourself to tell anyone about your disease until you are comfortable, including nonimmediate family members. Take control of your health, and stand up for yourself when you are in an uncomfortable situation. Do your infusions on your own time; don’t feel pressured to stick yourself or set up your infusions until you are ready. My parents still help me with my infusions, and I know other people who do the same. It’s OK to ask for help and support.

Thanks to my doctors, I was diagnosed and began antibody treatment much earlier than the average age of diagnosis.

Trudie Mitschang is a contributing writer for IG Living magazine.

Jessica volunteers for the Immune Deficiency Foundation as a plasma awareness coordinator to thank donors and on the Teen Council where she mentors youth living with chronic illness.
PATIENT PERSPECTIVE

Chronic Illness: Your Travel Companion

By Stacey Philpot

YOUR BAGS ARE packed, the boarding passes are in hand, the pets have had their last snuggles and you’ve double-checked the lights and locks. You scan the itinerary and emergency numbers one last time. You are officially ready. It’s going to be just like the movies!

Go ahead and laugh now. You know the chronic-illness version of travel is nothing like this. Yet, while it might look nothing like the movies, with the right preparations and precautions, it can still be legendary. So, don’t let your illness hold you captive. You know your illness is traveling with you, which means you have to plan for the worst and hope for the best. Here are a few tips to increase your chances of having more time to enjoy that view from paradise with your toes in the sand.

Prior to the trip:

● Clear your trip with all of your appropriate physicians. It’s important to make sure you’re currently healthy enough to make the journey, and your physicians feel comfortable the journey won’t set your progress back too far. Is there anything in particular they’d like you to do before or after to prepare or help you recover? Ask your physicians to refill all of your prescriptions and to consider medicine for nausea or anything else you may struggle with during prolonged travel.

● Pack sanitizers such as Lysol hand sanitizers and wipes for surfaces on trains and planes, as well as a face mask.

● Consider packing a travel fan to avoid getting overheated and bringing supportive walking shoes and any assistive devices you may need.

● Bring the phone numbers for all of your physicians in case a doctor at your destination needs to coordinate your care with them.

● Pack a current list of medications, treatments and allergies.

● Complete any regular treatments such as your immune globulin infusion.

During the trip:

● Make time to rest and recuperate! Resist the urge to push your body so hard you compromise your ability to get home or function upon return. Schedule time for rest.

● State your limits. If you’re traveling with others who are less limited, it may be tempting to try to keep up with them. Don’t! Be honest and up-front about what you can and cannot do.

● Be aware of the schedule and when it’s time to eat and take medications. Set the alarm on your phone, if needed, so you don’t forget. You’ll be pushing your body hard. Missing doses of your medications or meals will only make it harder on your body.

● Download an app on your phone that will alert you to the closest public restrooms.

● Before you go anywhere, study the transportation options in the location you’ll visit. If you should become very ill quickly, you’ll know how to get back to a place you can rest immediately.

● Download the Uber and Uber Eats apps in case you’re too sick to go out for food or cook.

● Take enough pictures to drive everyone in your location crazy.

● Have the time of your life.

After the trip:

● Wash everything that touched another location.

● Sanitize phones, laptops and handbags.

● Check in with your doctors.

● Rest, and then rest some more.

Just because you have a constant companion you’d rather leave at home, doesn’t mean you can’t have a fabulous trip. It does mean it will require more planning, and it will probably look a little different than it would for your healthy counterparts. It’s all about thinking ahead of your illness and planning for the ways it might affect you.

Most importantly, start small, but begin. Take a day trip. Take a trip to Target. Just go, and enjoy!

You know your illness is traveling with you, which means you have to plan for the worst and hope for the best.

STACEY PHILPOT is an author, goofball and avid reader. You can find her blog at chronicallywhole.com, where she shares her journey of making the most of a life touched by common variable immunodeficiency, Lyme disease and rheumatoid arthritis.
When Chronic Illness Seems to Rule Out Parenthood

By Ilana Jacqueline

HAVE YOU EVER been asked: “So why haven’t you had kids yet?” While there are many great articles and posts citing witty responses (or devastating ones) to this question, the issue is a common and complex challenge for chronically ill patients. I believe the “ifs” and “whens” of starting a family are your business. But, since I’ve delved deep in this column about decision-making and life planning with chronic illness, I wanted to broach this subject and reassure you your anxieties, hope and options are all real and valid.

Even if chronic illness doesn’t impact your ability to have children biologically, it may influence your timeline and ability to care for them in the way you want. Whether you’ve taken longer than others to finish school and establish careers, move out of your parents’ home and gain independence, find the energy to focus on your social life, date and choose your significant other — a life with children and family may seem decades out of reach.

I could reassure you this isn’t a reality, and that if you want it badly enough, you can snap your fingers and parent-hood will appear. But, it isn’t always that simple. Chronic illness may mean you have to wait your turn or turn the idea of what it means to explore parenthood on its head. And that’s OK. Why? Because you have options.

If you are unable to carry a child, you aren’t alone. There are plenty of options for those who aren’t healthy enough to sustain a pregnancy. These include surrogacy (having a third party carry your child), fostering and adopting a child. Nearly half a million American children are currently in the foster care system looking for adoptive parents, and surrogacy laws in the U.S. are some of the most responsible and advanced in the world.

If you wait until later in life to have children, you won’t be the only 40-year-old bringing a child to elementary school. In fact, at this rate, you’ll be in good company. According to a 2016 report by the Centers for Disease Control and Prevention, birth rates declined among women under age 30 in 2016, and rose for women aged 30 to 44. With improved fertility education and care, getting pregnant later in life is a much stronger possibility. So if now is not the time, it doesn’t mean the ticking clock is against you indefinitely.

There is no shame or abnormality in not starting a family in your 20s, and if it is still something you dream of pursuing, it isn’t time to quit dreaming just yet. Having children later in life allows you to become more established in your career, to prepare financially and have more flexibility with your work schedules. Most importantly, you have had more opportunities to learn coping mechanisms for the unpredictability of chronic illnesses.

Living child-free may be the reality for those whose illnesses have progressed to a point where they don’t feel physically well enough to take care of children. And, while there are many benefits to living child-free, they may not be comforting enough to patients who yearn for a family. However, if having or adopting children doesn’t fit into your life’s current design, it doesn’t mean you have to be alone. Just as patients need a village, so do parents. So find ways to be a part of the village.

Being an uncle or aunt (biological or otherwise) is an important role in a child’s life (if you choose to make it one). Many couples are also choosing to give and receive love as pet parents by adopting cats and dogs.

For those who can have children but are fearful low energy levels may leave them struggling to keep up with their needs, there’s no shame in receiving help. Even if you have a healthy spouse, it is important to have support, which can come in many forms. It can be paid child assistance such as a full- or part-time nanny or baby nurse, or even a mother’s helper. It can also be support from your family. Some couples move back in with one set of in-laws or have them (or just one grandparent) move in with them to help bear the load. Multigenerational households can be a great experience for children who will always have someone around to lean on.

You don’t have to make a decision about the future of your family at the peak of your illness, and you don’t have to hold the burden of fear that it may never be possible. Keep your eyes open and look around at the unconventional merged and unconventionally timed formation of the families around you and consider the alternatives that would work for you.

ILANA JACQUELINE is a 28-year-old dysautonomia and primary immune deficiency disease patient from South Florida. She’s been writing professionally since 2004 on everything from health and wellness to celebrities and beauty. Her blog www.letseybetter.com is both a personal collection of anecdotes about life with chronic illness, as well as a resource for patients of all ages.
As the mother of two teenagers, a “tweener” and a 9-year-old, I’m no stranger to kids who who have their own cell phones and those who want them. My oldest was 14 when she got her iPhone, and at the time, she was the last of her friends to get one. We held out as long as we could, until it made more sense for her to have one than not. With sports and traveling to out-of-town games, it’s almost a necessity to be able to communicate with kids via a text message or quick call.

Our second oldest was 13 when he got his phone. Now, our 11-year-old thinks it’s only fair he gets one, too. I’m not sure he can give me a good enough reason to add him to our monthly cell phone bill just yet. He has a tablet for playing games, and he can talk to his friends at school. Does he really need his own phone?

It can be hard for parents to decide when the right time is for their children to have a phone. If you ask your children, they’ll say they are the only one of their friends who doesn’t have one. But, in reality, that probably isn’t the case. It’s true: Cell phones do make many facets of life easier. But it isn’t all about convenience. Other factors should be considered when deciding if your children are ready for a cell phone.

When a Cell Phone Might Be a Good Idea

For some kids, having a phone is nothing but a liability. But, these days, it seems kids are involved in so many activities, going from one place to the next, it’s hard for parents to keep track of them — especially once they start driving. Easy access to our children gives parents peace of mind. For that, a cell phone might be worth getting. There are also kids who need to be in touch with their parents for safety or health reasons. For them, a phone could be a lifeline.

For kids who have life-threatening illnesses such as type 1 diabetes or severe allergies, when immediate medical attention could be the difference between life and death, a cell phone at an early age is a must. Even if it’s a simple flip phone or pay-as-you-go phone, the ability for those children to call for help could save their life.

For children and teens who suffer from chronic conditions, some exciting new apps make tracking symptoms and sharing information with health providers easier than ever. Mobile and computer-based apps are available to help patients, families and providers work together to improve the health of patients. Some apps are still being designed and tested in clinical trials for pediatric patients with chronic conditions such as cystic fibrosis and inflammatory bowel disease.1 These apps could benefit patients with many conditions, including primary immunodeficiency diseases (PIDs).

One of the advantages of using a health-tracking app is it gives children a tool to start managing their own health condition in a way they understand and feel comfortable. As adults,
we may have log books and paper charts to record infusion dates, lot numbers and site reactions, but kids today are very tech-savvy. If there’s an app to help them keep track of their chronic condition, they’re more likely to do it. And, that’s a habit parents should want to instill in their kids as early as possible.

The Downside of Cell Phones

Once children have their own phone, it’s only a matter of time before they become connected to social media. With social media comes the potential for cyberbullying, which is “social harassment via text, instant messaging or other social media.” To combat this, parents need to be aware of every social media site their children are on, and frequently check the activity on their children’s page.

Should parents go so far as to check who their children are calling and texting, and what they’re tweeting? “Absolutely,” says Caroline Knorr, parenting editor with the nonprofit group Common Sense Media. “I know that kids consider mobile devices to be personal property. And, they don’t want their parents snooping around. But I think parents are justified in saying, ‘I understand this can be used for good, but it also can be misused. So every new and then, I’m going to check to make sure you’re using it responsibly and respectfully.’ Then, make it an ongoing dialogue: ‘Have you gotten weird texts? Any calls that made you uncomfortable? Who are you texting?’”

Cell phones have also been linked to sleep problems in children. According to Susan Davis at WebMD, pediatricians are seeing growing evidence that cell phones — more specifically, notifications of texts and messaging apps — can disrupt children’s sleep patterns. “In a recent survey, four out of five cell-owning teens sleep with their phone on or by their beds, and teens who text were 42 percent more likely than those who don’t to keep their device close at night in case they got a text,” says Davis.

Sleep is important for growing kids, and it’s especially important for children who suffer from chronic conditions such as PI. Without enough sleep, the body gets run down and it becomes harder to fight off infections. It’s important for parents to set a phone curfew to ensure their children get enough sleep. At our house, when the kids go to bed, their phones stay downstairs to charge. That way, if a late-night text comes in, they’re not tempted to check it. It’ll still be there in the morning.

When to Say No

Depending on the children’s maturity level and their ability to handle the responsibility of owning a phone, it may be best to say “not yet” when the question arises. Some of the most important factors to consider involve the children’s overall sense of responsibility in other areas of life. Here are some questions for parents to ask themselves when making this decision:

- Do the children let parents know where they are going when leaving the house? Do they come home when they say they will?
- Do the children tend to lose things such as gym shoes, toys they bring to a friend’s house or library books? If so, they could possibly lose a phone, too. And that’s a much bigger expense!
- Does the children’s behavior fall within the limits set by their parents, or are they constantly testing those limits? If so, it may be hard for them to adhere to limits on minutes spent talking/texting, or data limits that could cost the family money if exceeded.
- Have the children ever acted like a bully to other children? If so, they may use the phone’s text, photo and video functions in a negative way to embarrass or harass others.

Starting Simple May Be Best

As children become more independent, especially once they reach middle school, it’s time to consider getting them a phone of their own. But if the mere thought of them having so much access at their little fingertips causes warning bells to go off in your head, then maybe it’s best to start out with a simple phone that does nothing more than allow them to talk and text. If children show they can be trusted with that responsibility, then maybe they can work up to a smart phone with more features later.

References

3. Common Sense Media. What’s the Right Age for Parents to Get Their Kids a Cell Phone? Accessed at www.commonsensemedia.org/cell-phone-parenting/whats-the-right-age-for-parents-to-get-their-kids-a-cell-phone?gclid=Cj0KCQjwlK7cBRCnARIsAJiE3Mht1ADNG7y59eUUSqBjJCUC2ZwQg6AlJR2ZrY2D6uKQ7cyYt6ACD84sABWTfALw-wF8.

JESSICA LEIGH JOHNSON is a stay-at-home mom and mother of four kids, three of whom have X-linked agamaglobulinemia. She is a member of American Christian Fiction Writers and has written one book about the loss of her son to a primary immunodeficiency.
Protecting Patient Privacy at the Touch of a Button

By Heather Bremner Claverie

NOT LONG AGO, file cabinets and fax machines were the high-tech vehicles used to store and share medical records. Then, healthcare providers began moving records to in-house servers. But, these days, most medical records are stored in the metaphorical sky or, in technological terminology, the cloud. In other words, electronic health records (EHRs) now live in web-based servers and are maintained by companies that provide the security and other administrative tools necessary to maintain patient privacy.

Storing medical data in electronic databases has its advantages. Physicians claim it helps reduce medication errors and enables them to quickly and easily send records. In addition, the cost to pay a cloud computing company is usually more affordable than hiring in-house personnel.

Yet, while paper files could be protected by alarms, security guards and lock and key, EHRs are susceptible to cybercriminals who can hack into the systems and steal this private information. Fortunately, companies that provide medical data storage are tightening their cybersecurity. In fact, a variety of storage options are available depending upon the healthcare company, hospital or physician’s needs.

Storing Patient Data: The Regulations

There is no single format for EHRs that healthcare providers are required to use. However, there are security measures they must take. And, if auditors determine they failed in this respect, they can be fined.

The U.S. Department of Health and Human Services (HHS) has extended the medical privacy act known as the Health Insurance Portability and Accountability Act (HIPAA) to include specific cybersecurity regulations for cloud-computing databases. Any healthcare provider, from a small-town doctor to a medical HMO to a billing company, must follow HIPAA guidelines. In addition, under the 2009 Health Information Technology for Economic and Clinical Health (HITECH) Act, anyone, even a subcontractor such as a cloud-computing company, that creates, receives, maintains or transmits protected health information falls into the covered-entity category. This act also significantly increased the penalties from a previous rate of $100 per violation and a maximum of $25,000 to a range of $100 to $50,000 per violation and a maximum of $1.5 million depending on the severity of the claim and the determined liability of the institution.

Cloud Computing

With the widespread proliferation of cloud computing, HHS has enacted specific rules to ensure entities strive to maintain secure patient medical data and limit breaches. HIPAA requires that when physicians or other covered entities use companies to store their medical data, they must enter into a contract with the business associate that specifies the safeguards they must follow to protect patients’ health information:

• Covered entities must identify and analyze any potential risks to the security of the documents.
• Measures to address any identified risks must be implemented.
• A designated security official must be appointed to develop and implement all security measures.
• Covered entities should not use or disclose protected health information, unless permitted by their agreement or are legally required to do so.
• They must use all appropriate safeguards to comply with the privacy act with respect to electronic medical records.
• If a breach is discovered, the entity must disclose the incident.

The Good News

In the old days when paper was king, transmitting and receiving healthcare documents often took weeks or longer. With the use of technology, medical records can now be sent to various sites and to patients, healthcare workers and hospitals immediately. Also, with the popularity of mobile access, many companies now offer packages that allow access on devices such as iPads and iPhones.

Many of the HIPAA violations boil down to improperly executed or nonexistent business associate agreements. Therefore, when signing up with a medical data storage company, make sure the agreements are properly executed to protect all parties.

HEATHER BREMNER CLAVERIE is a contributing writer for IG Living magazine.
One of the major benefits of Microsoft’s OneDrive is that many healthcare organizations are already using Microsoft Office. The software company’s enterprise cloud services are HIPAA- and HITECH-compliant and are billed as one of the most secure in the industry. Prices start at $35 a month for the Enterprise E5 system, which includes storing 1 terabyte of files and advanced security management that assesses risks and threats.

onedrive.live.com/about/en-us/business

**Carbonite for Office users can enjoy perks like backup recovery for disasters and compliance with the Massachusetts Data Security Regulation, which they claim offers the most secure data nationwide. Carbonite offers data encryption in both the cloud and locally. Plans range from $269.99 to $1,299.99 per year. The first two include 250 GB of storage and the enterprise version has 500 GB of storage.**

www.carbonite.com/backup-software/buy-carbonite-safe

**Dropbox is a familiar brand name to many healthcare workers, and since becoming HIPAA- and HITECH-compliant in 2015, it can now be used for confidential medical records. Customers who are already using Dropbox Business can sign a business associate agreement electronically. Prices vary depending upon the package.**

www.dropbox.com

**Carry It On**

Google has jumped into the medical sector with its G Suite for healthcare businesses by Google Cloud. Customers can now opt to store their patient data in a HIPAA-compliant sector of Google Drive. The company offers mobile device management and specialty encryption software for its service. The enterprise account, which includes all the necessary security measures and unlimited storage, is $25 a month per user. Potential customers can sign up for a trial run.

gsuite.google.com/industries/healthcare

**Just Google It**

**Sky’s the Limit**

CareCloud was established as an electronic medical record application for the healthcare industry in 2009. At a beginning rate of $628 a month, this company is pricier than its competitors, but many users give it high marks for versatility and ease of use. It’s designed to meet a variety of practices, from a one-physician office to a large hospital.

www.carecloud.com/ehr

**Shopping Guide to Medical Data Storage**

**Key for Convenience**

**Boxing Day**

Box for Healthcare, a cloud storage company, began marketing its services in the healthcare sector six years ago when they became HIPAA- and HITECH-compliant. Doctors can use Box to store a patient’s medical records or clinical summary in the cloud, and share clinical documents, images and medical records with other healthcare providers and patients. Contact them for pricing.

www.box.com/industries/healthcare

**Back It Up**

**Back It Up**

Carbonite for Office users can enjoy perks like backup recovery for disasters and compliance with the Massachusetts Data Security Regulation, which they claim offers the most secure data nationwide. Carbonite offers data encryption in both the cloud and locally. Plans range from $269.99 to $1,299.99 per year. The first two include 250 GB of storage and the enterprise version has 500 GB of storage.

www.carbonite.com/backup-software/buy-carbonite-safe

**Dropbox**

**Just Drop It**

Dropbox is a familiar brand name to many healthcare workers, and since becoming HIPAA- and HITECH-compliant in 2015, it can now be used for confidential medical records. Customers who are already using Dropbox Business can sign a business associate agreement electronically. Prices vary depending upon the package.

www.dropbox.com

**Google has jumped into the medical sector with its G Suite for healthcare businesses by Google Cloud. Customers can now opt to store their patient data in a HIPAA-compliant sector of Google Drive. The company offers mobile device management and specialty encryption software for its service. The enterprise account, which includes all the necessary security measures and unlimited storage, is $25 a month per user. Potential customers can sign up for a trial run.**

gsuite.google.com/industries/healthcare

**Google has jumped into the medical sector with its G Suite for healthcare businesses by Google Cloud. Customers can now opt to store their patient data in a HIPAA-compliant sector of Google Drive.**

**Google has jumped into the medical sector with its G Suite for healthcare businesses by Google Cloud. Customers can now opt to store their patient data in a HIPAA-compliant sector of Google Drive. The company offers mobile device management and specialty encryption software for its service. The enterprise account, which includes all the necessary security measures and unlimited storage, is $25 a month per user. Potential customers can sign up for a trial run.**

gsuite.google.com/industries/healthcare
Waiting for Good News: Living with Chronic and Serious Illnesses

Sally Wilke has lived with and through the serious chronic illness of someone for whom she cared deeply. She organizes this book around seven questions those who face serious illness often ask, from “What is the diagnosis?” to “Where do I find more help?” The heart of the book is the stories, including Wilke’s own, those of others who have struggled with severe illness and accounts from the Bible. Wilke offers tools, tips, ideas and resources for reflection and for obtaining additional support. Chapters conclude with questions that may be used for personal reflection and discussion with family members, patients and support groups.

It’s Grief: The Dance of Self-Discovery Through Trauma and Loss

Edy Nathan, a licensed therapist, offers a unique approach to dealing with trauma and loss. She introduces the 11 phases of grief that identify the dark and unfamiliar effects on self. The book features a mix of science-based knowledge with heart-centered compassion. Included are workable tools from two decades of experience to help readers actively shift moods, crippling thoughts and behavior. According to Nathan, this book is supportive without sugar-coating. A corresponding workbook features practical exercises to help without preaching or dictating how to grieve.

100 Tips and Tools for Managing Chronic Illness

Written by a licensed psychotherapy social worker and chronic fatigue syndrome patient, this book offers an incisive supplement to her previous book (Living Well with Chronic Illness) with 100 tips composed of 10 chapters, each containing a common theme of encouragement. The author’s advice focuses on those managing chronic illness; however, the timely affirmations serve a much wider audience seeking positive resolutions to daily life pressures. A recurring thread throughout emphasizes the importance of living in the moment and finding creative solutions in challenging circumstances.

Lab Values: Everything You Need to Know about Laboratory Medicine and Its Importance in the Diagnosis of Diseases

While this book is written to help medical students differentiate between normal and abnormal laboratory results, as well as to help place them in proper clinical context, it can also serve as a useful tool for the layperson wanting to understand their own lab results. For easy understanding, this book has been categorized into various sections based on the similarity of lab tests. The last section deals with grouping of tests that are performed routinely, in emergencies and in special healthcare situations. At the end of the book, there is an exercise section that contains multiple-choice questions followed by detailed answers.

New and Useful Reading
Download the IG Living eBook today—now available for iPad, Nook and Kindle!

“You can lament what is lost to you, whether it’s opportunity, a person or your health, but clinging to anger is no way to experience life.” — Rebecca Zook in “Life Lessons,” excerpted from Chronic Inspiration.

Download a daily dose of inspiration with this heartfelt compilation of writings on life with chronic illness. From coping strategies and parenting tips to “from the trenches” advice on dealing with family and friends who simply don’t get it, these personal stories are sure to uplift, challenge and inspire. Honest and candid, Chronic Inspiration: Heartfelt Perspectives on Life with Chronic Illness gives voice to those who refuse to let their diagnosis define who they are or what they can accomplish.

“For the patient community, this was invaluable. When I downloaded it, I knew this would be something I would refer to over and over again.”

— Jenny Gardner

Chronic Inspiration can be purchased on iTunes, Amazon and Barnes and Noble.com
Ataxia Telangiectasia (A-T)

**WEBSITES**
- A-T Children’s Project: www.atcp.org

Chronic Inflammatory Demyelinating Polyneuropathy (CIDP)

**WEBSITES**
- GBS/CIDP Foundation International: www.gbs-cidp.org
- The Foundation for Peripheral Neuropathy: www.foundationforpn.com

Evans Syndrome

**ONLINE PEER SUPPORT**
- Evans Syndrome Research and Support Group: www.evanssyndrome.org

Guillain-Barré Syndrome (GBS)

**WEBSITES**
- GBS/CIDP Foundation International: www.gbs-cidp.org
- The Foundation for Peripheral Neuropathy: www.foundationforpn.com
- GBS Support Group: www.gbs-support.org.uk
- GBS/CIDP Foundation International Discussion Forums: forum.gbs-cidp.org/forum/main-forum

Idiopathic Thrombocytopenic Purpura (ITP)

**WEBSITES**
- ITP Support Association – UK: www.itpsupport.org.uk
- Platelet Disorder Support Association: www.pdsa.org

Kawasaki Disease

**WEBSITES**
- American Heart Association: www.heart.org/HEARTORG/Conditions/More/CardiovascularConditionsOfChildhood/Kawasaki-Disease_UCM_308777_Article.jsp#.T1T2boePWE0
- Kawasaki Disease Foundation: www.kdfoundation.org
- KidsHealth: kidshealth.org/parent/medical/heart/kawasaki.html

Mitochondrial Disease

**WEBSITES**
- United Mitochondrial Disease Foundation: www.umdf.org
- Mitochondrial Action: www.mitoaction.org

Multifocal Motor Neuropathy (MMN)

**WEBSITES**
- The Foundation for Peripheral Neuropathy: www.foundationforpn.com

Multiple Sclerosis (MS)

**WEBSITES**
- All About Multiple Sclerosis: www.mult sclerosis.org/index.html
- Multiple Sclerosis Association of America: mymsaa.org
- Multiple Sclerosis Foundation: www.msfocus.org
- National Multiple Sclerosis Society: www.nationalmssociety.org

Myasthenia Gravis (MG)

**WEBSITES AND CHAT ROOMS**
- Myasthenia Gravis Foundation of America (MGFA): www.myasthenia.org
- ONLINE PEER SUPPORT
- Genetic Alliance: www.geneticalliance.org

Myositis

**WEBSITES**
- The Myositis Association: www.myositis.org
- International Myositis Assessment and Clinical Studies Group: www.nih.gov/research/resources/imacs
- ONLINE PEER SUPPORT
- Juvenile Myositis Family Support Network: www.curejm.org
- The Cure JM Foundation: www.curejm.org
- Myositis Association Community Forum: www.myositis.org.uk

Pediatric Autoimmune Neuropsychiatric Disorder Associated with Streptococcus (PANDAS)

**WEBSITES**
- PANDAS/PANS Advocacy and Support: www.panscare.org
- PANDAS Network: www.pandasnets.org
- Midwest PANS/PANDAS Support Group: www.midwestpandas.com

Peripheral Neuropathy (PN)

**WEBSITES**
- Neuropathy Action Foundation: www.neuropathyaction.org
- Western Neuropathy Association: www.pnhelp.org
- Neuropathy Alliance of Texas: neuropathyalliancetx.org
- The Foundation for Peripheral Neuropathy: www.foundationforpn.com

Primary Immune Deficiency Disease (PI)

**WEBSITES**
- Immune Deficiency Foundation: www.primaryimmune.org
- Jeffrey Modell Foundation: www.info4pi.org
- The National Institute of Child Health and Human Development (NICHD): www.nichd.nih.gov/Pages/index.aspx
- American Academy of Allergy, Asthma & Immunology: www.aaaai.org
- International Patient Organisation for Primary Immunodeficiencies (IPOD) — UK: www.ipodi.org
- New England Primary Immunodeficiency Network: www.nepin.org
- Rainbow Allergy-Immunology: www.uhospitals.org/rainbow/services/allergy-immunology
- ONLINE PEER SUPPORT
- IDF Friends: www.idffriends.com
- Jeffrey Modell Foundation Facebook Page: www.facebook.com/JMFworld
- IDF Peer Support Program: www.primaryimmune.org/idf-peer-support-program
- Michigan Immunodeficiency Foundation: www.primaryimmune.org/en/nonprofit/2432ea2b2a15942e506e6c38a88703c83e-michigan-immunodeficiency-foundation-monroe

Scleroderma

**WEBSITES**
- Scleroderma Foundation: www.scleroderma.org
- Scleroderma Research Foundation: www.srfcure.org
- Johns Hopkins Scleroderma Center: www.hopkinsscleroderma.org
- ONLINE PEER SUPPORT
- International Scleroderma Network: www.sclero.org/support/forums/a-to-z.html

Stiff Person Syndrome (SPS)

**WEBSITES**
- American Autoimmune Related Diseases Association Inc.: www.aarda.org
- Genetic Alliance: www.geneticalliance.org
- Living with Stiff Person Syndrome (personal account): www.livingwithspss.com
- Stiff Person Syndrome: www.stiffpersonsindrome.net
BioSupply® is the online product ordering platform by FFF Enterprises, Inc., the largest and most trusted distributor of plasma products, vaccines, biosimilars and other specialty pharmaceuticals and biopharmaceuticals. Visit www.ffenterprises.com to learn more about us.

BioSupplyOnline.com makes ordering your products easy, fast and convenient!

Available Products
- Albumin/Plasma Protein Fraction
- Coagulation Products
- Hyperimmune Globulins
- Immune Globulins
- Influenza Vaccines & Treatment
- Specialty Biopharmaceuticals & Pharmaceuticals
- Other Vaccines
- Surgical Sealants
- Ancillary Products
- Oncology
- Biosimilars
- Generic Injectables

We are proud to be an accredited NABP® Verified-Accredited Wholesale Distributor for all authorized U.S. plasma products manufacturers.

BioSupply is a quick and easy-to-use platform offering instant access to the critical-care products you need when you need them. Our customer-driven online portal empowers you to order what you want, when you want it, with just one click so you can better manage your inventory. With over 28 counterfeit-free years, you know you are buying from a trusted leader in the industry. BioSupply offers:

- At-a-glance access to your account information
- Links to view open orders and ordering history
- Shortcuts to frequently purchased products
- FFF Sales Team contact information
- Detailed product pages
- Product alternatives if products are back-ordered or unavailable
- Convenience and accessibility to drop-ship products
- Shopping Cart feature displays account number and shipping address to minimize purchasing errors
- My Favorites feature for frequently ordered products
- BioVision reporting tool provides analysis of purchasing patterns

For ordering support, contact our Wow! Customer Care team:
P: (800) 843-7477 | Emergency Ordering available 24/7/365
F: (800) 418-4333
E: customerservice@ffenterprises.com
Want **priority access** on **FLU VACCINES** for the **2019-2020 season**?

Then take advantage of our **NEW inclusive MFV Loyalty Program** and enroll for the 2019-2020 season when you go to book your flu vaccine orders for the 2018-2019 season through MyFluVaccine.com.

- Priority access on advance released flu vaccines
- No minimum purchase
- Hassle-free
- Guaranteed booking for the products you need

**YOU PICK THE PREFERRED DATE • YOU PICK THE QUANTITY • WE DELIVER**

(800) 843-7477 | MyFluVaccine.com