



THE IMPORTANCE OF PREVENTING INFECTIONS

People with chronic lymphocytic leukemia (CLL) and small lymphocytic lymphoma (SLL) are at higher risk of developing infections due to having weakened immune systems. Respiratory infections like pneumonia, COVID-19, RSV, and influenza are of particular concern, although any type of infection should be taken seriously and be closely monitored by your healthcare team. Infections are contracted more easily, there is a higher risk of developing a more severe form of any given illness, and the recovery time may be longer and more difficult compared to those with healthy immune systems.

ARE ALL INDIVIDUALS WITH CLL AND SLL CONSIDERED IMMUNOCOMPROMISED?

Yes. Everyone diagnosed with the disease is considered immunocompromised, even when symptoms are not present and regardless of treatment status. Although we know that the risks associated with infections worsen as the disease progresses and while receiving certain treatments, even those early in the disease and those that have never started treatment are immunocompromised.

WHY DO INFECTIONS TEND TO BECOME MORE SERIOUS?

CLL and SLL are a type of blood cancer, but it is also considered a cancer of the immune system. This is because B cells, which are a type of white blood cell, become cancerous and are not healthy enough to function properly. B cells play an important role in fighting off infection by producing antibodies. Dysfunctional B cells cannot fight infection like healthy cells do because they have a decreased ability to produce an adequate number of antibodies in response to both vaccines and infection. Also, the quality of the antibodies produced are often poor. Not only are B cells affected, but the presence of cancerous cells negatively influences several other aspects of the immune system including T cell activity. Additionally, some treatments commonly used to treat the disease (such as rituximab, obinutuzumab, and others) can further reduce the ability to produce antibodies and impact overall immune system function.

ARE VACCINES HELPFUL FOR THOSE WHO ARE IMMUNOCOMPROMISED?

Yes. Vaccinations are a safe and effective way to boost immunity and are one of the most important tools available to prevent infection. Non-live vaccines are considered safe to administer to those with CLL and SLL. Although we know a lot about vaccine responses in the general population, until the COVID-19 pandemic, immunocompromised individuals were largely excluded from vaccine clinical trials. The large amount of research

performed during the pandemic helped scientists gain a better understanding of vaccine effectiveness in immunocompromised individuals, but there is still more to learn.

Those with CLL and SLL may not respond as robustly to the same number of doses of vaccines that are recommended for the general public. Additional booster doses of certain vaccines may be necessary to provide an adequate amount of protection. It is important to remember that since everyone diagnosed with the disease is immunocompromised, even a partial or reduced response to vaccines can still offer some protection against serious infection, hospitalization, and death.

Those who are very early on in their diagnosis and have not yet started treatment tend to have a better response to vaccines compared to those whose cancer has advanced or who are undergoing certain treatments. This is why it is important to receive all vaccinations as recommended for immunocompromised individuals by the Centers for Disease Control (CDC) as early as possible in the course of the disease, and then continue to stay up-to-date on additional recommended doses and boosters in a timely manner.

ARE THERE ANY VACCINES THAT SHOULD BE AVOIDED?

Yes. You should not receive any vaccines that contain live particles of virus or bacteria, as these vaccines may cause the infection that the vaccine is trying to prevent. Some examples of live vaccines include:

- Adenovirus
- Tuberculosis (BCG)
- Live-attenuated influenza vaccine (delivered as a nasal spray)
- Measles, mumps, and rubella (MMR)
- Oral poliovirus (OPV)
- Rotavirus
- Smallpox
- Oral Ty21a Salmonella typhimurium (oral typhoid vaccine)
- Varicella (chickenpox)
- Yellow Fever



Always discuss which vaccines are recommended with your healthcare team. The need for travel vaccines is highly individualized and depends on the area that is being traveling to, and the length of time being spent there. If planning a trip abroad, the need for specific traveled vaccines is best discussed with an infectious disease and/or travel medicine specialist.

SHOULD ANTIBIOTICS AND ANTIVIRALS BE TAKEN PREVENTATIVELY?

The decision to start preventative medications is very personalized. Some may need preventative antibiotics or antivirals because of frequent reoccurring infections, or sometimes they are needed when the cancer is being treated with certain medications.

Antibiotics have side effects, including the possibility of developing antibiotic-resistant bacteria. Additionally, other serious infections can happen when you kill all of your body's normal bacteria, one being a severe diarrhea illness called *Clostridium difficile* (C. diff). Therefore, the decision to start a preventative antibiotic should only occur after a careful discussion of risks and benefits between you and your healthcare provider. Sometimes the antibiotic Bactrim or Septra is used to prevent the rare but serious infection known as pneumocystis pneumonia (PCP) in those who are more severely immunocompromised.

The antiviral acyclovir is sometimes given to prevent herpes infections from resurfacing that have been living dormant in the body for many years. This includes herpes zoster (shingles) and herpes simplex (cold sores and genital herpes).

WHAT ELSE CAN BE DONE TO HELP PREVENT INFECTIONS?

Hand Hygiene. Hand washing is one of the most effective ways to prevent infection, but it must be performed properly and often. Hand sanitizer containing at least 60% alcohol can also be used. However, when hands are visibly dirty, soap and water should be used instead of hand sanitizer.

Here are some tips for effective handwashing:

- First, wet hands under running water.
- Apply soap to hands and rub together vigorously for at least 20 seconds, covering all surfaces of the hands front and back, between the fingers, and under the fingernails.

- Rinse hands under clean, running water, and dry thoroughly.

Here are some tips for using hand sanitizer effectively:

- Apply the product to the palm of one hand and rub hands together vigorously, covering all surfaces of the hands front and back, between the fingers, and under the fingernails until the hands are dry (this takes approximately 20 seconds).
- Antimicrobial-impregnated wipes (i.e., towelettes) may be considered as an alternative to washing hands when you do not have immediate access to running water.
- Hand sanitizer should not be used solely in place of hand washing.
- If you only have access to hand sanitizer, wash with soap and water as soon as it is available to you.

Masking. Wear a well-fitted N95 or similar mask in high-risk situations (including indoor spaces, public transportation, or any other crowded situation). Masking is a helpful tool to prevent respiratory infections, but they must be worn consistently and fit properly.

Intravenous Immune Globulin (IVIG) Infusions.

The most common type of antibody that the immune system produces to fight off infection is called immunoglobulin G (IgG). Since those with CLL and SLL have difficulty producing healthy antibodies (including IgG), it is common to have a low level of IgG. If your levels remain low or if you are getting frequent infections (typically 3 or more within 6 months), your healthcare provider may suggest that you receive an intravenous (IV) infusion of healthy IgG antibodies known as IVIG that have been collected from thousands of blood donors. IVIG may help to protect against infection and is typically given once a month. IVIG can also be self-administered at home subcutaneously (an injection using a very small needle that is inserted just under the skin). IVIG infusions are time-consuming and have side effects, so they should only be started after a careful discussion about the risks and benefits with your healthcare team.