A Guide to Sublingual Immunotherapy

Allergy Shots vs Allergy Drops

What is SLIT? Sublingual immunotherapy (SLIT) is an alternative way to treat allergies and does not require the use of an injection. It helps the body build tolerance to allergens by administering allergens as droplets under the tongue on a daily basis with a gradual increase in the dosing.

SLIT vs SCIT Subcutaneous immunotherapy (SCIT) is a treatment option that requires the use of injections to help build tolerance to allergens. On the other hand, sublingual immunotherapy (SLIT), is an option that utilizes tablets or droplets under the tongue to help build tolerance to allergens. SCIT involves frequent injections to be done at the office. SLIT can be done at home after the first dose is administered in the office to ensure that it is tolerated well by the patient. SCIT is FDA approved for allergic rhinitis and allergic asthma. On the other hand, SLIT is only approved in the form of tablets for ragweed, northern pasture grasses, like timothy grass, and dust mites. There has not yet been FDA approved formulation for liquid drops.

How Does it Work? The first step is to receive allergy testing in order to determine which specific allergens are causing the allergic symptoms. A custom-mixed vials with different dilutions will then be created for the patient and drops will be taken under the tongue daily. The target dose for this treatment can be reached in 15 days. The first 5 days is called the build-up phase, in which the patient builds up immunity or "tolerance" to the allergen by gradually increasing the dosage of the drops. After that, it takes 10 more days to reach the maintenance level in which the patient will continue to take the same dose of drops every day for 3-5 years. The initial dose will be given at a medical office and if it is well tolerated, the following daily doses are taken at home.

Effectiveness and Risk Subcutaneous immunotherapy (SCIT) and sublingual immunotherapy (SLIT) are safe for both adults and children. When comparing SCIT and SLIT across multiple scientific studies, the analysis suggests greater efficacy of SCIT when it comes to treating allergy symptoms. Side effects can include local reactions and in very rare cases, systemic reactions may occur.

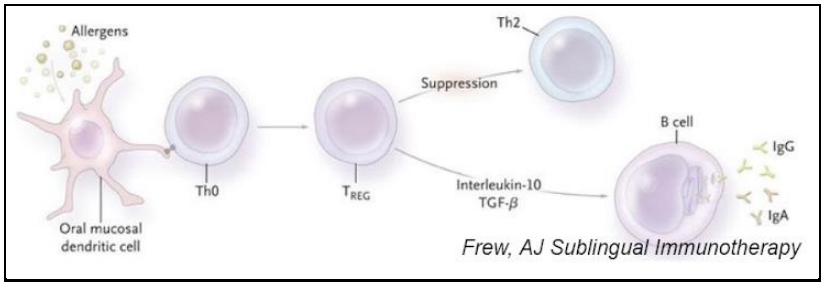
How Does Sublingual Immunotherapy Work?

What is Sublingual Immunotherapy (SLIT)? The purpose of immunotherapy is to help someone build tolerance to an allergen by giving them small doses of what they are allergic to. By building tolerance or "immunity", the person experiences less allergic symptoms. Sublingual immunotherapy is an alternative way to treat allergies without the use of injections.

How Does the Process Work? The first step would be to have the patient undergo allergy testing, like in any visit to an allergy clinic, in order to determine what the patient is allergic to. After that is complete, a custom vials of drops with different concentrations (specific to the patient) can be created. The patient takes drops under the tongue daily and as instructed. The first couple of months is called the build-up phase, where the dosage is gradually increased. Once the target dose is reached, the patient enters the maintenance phase, where the patient takes the same dose every day. After that, the patients are recommended to keep taking the drops for three to five years so that the body can build lasting immunity.

How Does Allergen Specific Immunotherapy Work in General? When the immune system comes in contact with a harmless substance and overreacts, it is known as an allergic reaction. The harmless substance is called the allergen. Our immune system is in charge of protecting us from diseases, viruses and infections. However, the body can also react to allergens (i.e.: dust mites, mold, insect stings, pollen, certain foods etc.) which can trigger the production of Immunoglobulin E (igE) antibodies. The IgE antibodies then go to cells that release chemicals which can cause symptoms that occur in nose, ears, lungs, throat, sinuses, lining of skin or stomach.

What are the Mechanisms of Sublingual Immunotherapy? This is a topic that has been studied for many decades. It is important for researchers and doctors to understand the characteristics and mechanisms for immunotherapy (IT). There are different routes of immunotherapy, such as subcutaneous immunotherapy (SCIT), oral immunotherapy (OIT) and now sublingual immunotherapy (SLIT). Therefore, understanding the mechanisms of how each works can then help the clinician figure out which method is best suited for each patient. Sublingual immunotherapy is self-administered and the allergen is kept under the tongue (1-2 min) before it is swallowed. The allergen crosses the mucosa in about 15-30 minutes and is taken up by the Langerhans' cells (via surface IgE receptors) which are located in the sublingual mucosa. The dendritic cells are then in charge of bringing the allergen to the lymph nodes or areas that are rich in T cells. Inside of the lymph nodes, the dendritic cells present the allergen to the T cells. In addition to that, IL-10 is produced. This mechanism is very similar to that of subcutaneous immunotherapy (SCIT).



Key words:

- **Langerhans' cells:** dendritic, antigen presenting cells. They are present in the epithelium of the skin as well as the mucosa, which includes the oral cavity.
- **Dendritic cells:** Antigen-presenting cells with the role of processing antigen material and presenting it on the surface of T cells.
- **T cell**: a lymphocyte that develops in the thymus gland and plays an important role in immune response. There are 4 types: cytotoxic T cells, Helper T cells, Memory T cells and Natural Killer T cells
- **IL-10**: Interleukin 10, and is also referred to as human cytokine synthesis inhibitory factor (CSIF). It is an anti-inflammatory cytokine.
- **IgE**: Immunoglobulin E are antibodies that are produced by the immune system. For a person who has an allergy, the immune system responds to an allergen by producing IgE antibodies.

How to Administer Sublingual Immunotherapy

Sublingual immunotherapy (SLIT) is a treatment option that desensitizes allergic reactions to environmental allergies with the application of drops (under the tongue) that contain allergen extracts. This type of treatment should be taken under the care of a physician who is trained to prescribe allergen vaccines and is trained to treat any possible allergic reactions. The initial dose will be given at a medical office and if it is well tolerated, the following daily doses are taken at home. For the initial dosing, it is recommended that the patient wait in the prescribing doctor's office for at least 30 minutes after the allergy drops are administered.

Drop Bottle & Dispenser A small pump dispenser can be used to apply the droplets under the tongue. It is important to remember to press the pump firmly to release the allergy extract dose. In order to take the dose, the dispensing arm of the pump is rested on the lower front teeth. Then the pump is pressed quickly and firmly until a drop is released under the tongue.

*These vials can be kept at room temperature for at least 30 days, but if it is not being used it needs to be refrigerated.

How to administer your allergy drops Apply the exact number of allergy drops (per day) that was recommended by the prescribing doctor and is on the schedule for the treatment plan. After applying the drops under the tongue, hold them for 2-3 min before drinking or eating as needed. Don't eat for 5 min after taking the drops.

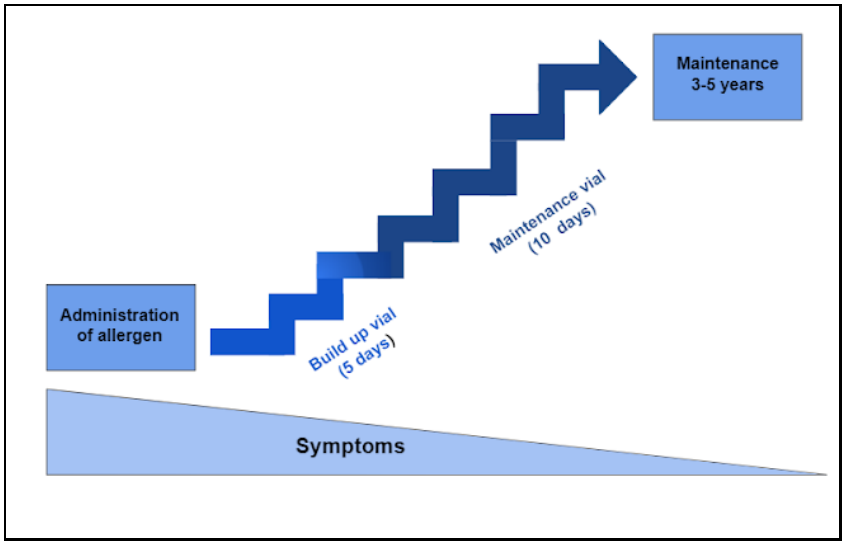
How Safe is Sublingual Immunotherapy?

In regards to sublingual immunotherapy, the U.S. Food and Drug Administration (FDA) has approved 4 allergy tablets (two for two different kinds of grass pollen, ragweed, and dust mites). There are currently no FDA approved formulations for liquid drops. The effectiveness of the mixture of allergen extract drops is still being researched.

Potential Local Adverse Reactions Local reactions are the less severe and are usually limited to itching of the mouth or upset stomach. It is more likely for these adverse reactions to occur at the start of treatment or when new bottles are started because of the increased dose of allergy extract. Reactions to the allergy drops usually occur after taking them, but it is not uncommon for a reaction to occur hours later. Most reactions will resolve on their own or with the use of antihistamines. If the adverse reactions persist, notify the doctor and adjustment to your dose or use of antihistamines can help resolve the discomfort. Please contact the office if adverse reactions last more than an hour.

Systemic Adverse Reactions Systemic adverse reactions occur less frequently than local adverse reactions. Systemic, meaning that it occurs throughout the body, can include mild to moderate urticaria (hives) or itching of the skin. It can also include angioedema (swelling) of the ears, lips, tongue, throat, intestine, hand and feet. These reactions normally occur within minutes of taking the dose. Occasionally, systemic reactions may be accompanied by symptoms related to asthma and may progress to anaphylactic shock. Anaphylaxis is a very severe, and potentially life-threatening allergic reaction which requires immediate medical attention. Call 911 and/or use your epinephrine auto-injector (Epi-pen) if this reaction is to occur. Please stop using the allergy drops and contact our office if you begin to develop any systemic reactions. Adjustment of dosing or termination of the therapy may be required.

Schedule for Sublingual Immunotherapy



Build-Up Phase After meeting with the prescribing physician, a schedule will be made for the patient in order to help them build tolerance to the allergen. This phase is called the build-up or escalation phase in which the amount of allergens the patient is exposed to is increased every day. This is done in order to help with desensitization to the allergen, or increasing allergen exposure to change the immune system's response. Patients will take the build-up vial for five days before moving onto the maintenance vial. The schedule can be modified at any point if there is any discomfort. It is advised to consult with the physician before any changes are made.

Maintenance It will take about ten days to build up to the final maintenance dose. After that, the maintenance dose (five drops per day) will be taken daily. It is recommended that these doses be taken in the morning. Unlike the build up dose, the maintenance dose is the highest dose the patient is able to tolerate without any discomfort and the same dose is taken every day. The maintenance schedule can be adjusted by the physician if the patient is unable to tolerate the full dose.

How to Start Sublingual Immunotherapy at AACB

Do I Need Allergy Testing? If you are a new patient at the Allergy and Asthma Center of Boston or would like to set up an appointment to learn more about Sublingual Immunotherapy, it is common to get allergy testing done in order to have a better understanding of your allergy profile (what you are allergic to). Once your allergy profile has been determined, it will be easier to figure out if sublingual immunotherapy is the right option for you!

What is Allergy Testing? Once the physician takes a detailed patient history, you can get tested for specific allergens. The first test that is done is the skin prick test and it can test for immediate allergic reactions to as many as 40 substances at the same time. This test can help identify allergies to mold, pollen, dust mites, pet dander and foods. Intradermal allergy testing is another technique that can be used to determine if you are allergic to a specific allergen. This is usually done if the skin prick test comes out negative (no immediate reaction). Intradermal allergy testing involves a superficial injection into the skin and it is different from prick testing which does not involve needles.

Give us a Call! Visit our website at https://www.allergyasthmaboston.com/ to learn more about us and to learn more about allergies and Sublingual Immunotherapy (SLIT). Look under the Educational Resources section for more information about SLIT. We have offices located in Boston and Needham, so come to a location most convenient for you!