

# Your quick guide to: Immunotherapy

## What is Immunotherapy?

Immunotherapy, often referred to as desensitisation, is a unique treatment for allergic diseases. It is a well-established treatment reserved for certain severe allergies such as when someone has had a serious allergic reaction to wasp or bee venom or severe allergic rhinitis that has not been previously controlled by any of the anti-allergy medication tried. New Immunotherapy products are being developed and used for specific food allergy such as peanut.

Immunotherapy usually involves the administration of increasing doses of allergen extracts over a period of time, given to patients by injection or drops/tablets under the tongue (sublingual).

Food allergen desensitisation aims to reduce reactivity to the allergen and is done under very controlled medical conditions, (currently only available privately) but newer approaches to administration (such as by a skin patch that is worn and replaced) may become available in the future. These types of approaches to food desensitisation are very new and not widely available yet, but it something to provide hope for in those at risk of severe food allergic reactions.

Allergy develops when the immune system makes IgE antibodies to 'fight off' a substance (allergen) that wouldn't normally bother us, such as pollen, animal dander, house dust mites, mould spores, foods or the venom of bees or wasps. Immunotherapy is an attempt to modify the immune system so that it no longer reacts to allergens in the same allergen way. By giving the patient increasing doses of the allergen at regular intervals (starting with a very small dose) in a carefully controlled way, it is possible to teach the immune system to tolerate the allergen and not 'fight' it. If successful, immunotherapy causes the production of 'regulatory' immune cells, which stop the production of IgE and result in less reactivity to the allergen.

All immunotherapy carries a degree of risk,

is time-consuming and expensive. In the UK, it is generally reserved for patients with specific, severe allergies, particularly:

- Treatment of potentially life-threatening allergic reactions to bee and wasp stings.
- Allergic rhinitis (hay fever) where symptoms are severe.

The evidence for immunotherapy in atopic eczema and asthma is limited, although recent advances have shown that house dust mite sublingual immunotherapy can prevent exacerbations in adults with allergic asthma.

## Will I benefit from immunotherapy?

Patients with certain allergies may be considered for it:

### 1. Life-threatening reactions to wasp or bee stings.

Severe reactions include sudden collapse (anaphylactic shock) or other life-threatening reactions such as swelling of the airways.

Venom immunotherapy is highly effective, giving 98% protection against serious wasp venom reactions and about 90% protection against serious reactions to a bee sting. Patients with severe allergy to wasp and bee stings should always carry injectable adrenaline (epinephrine), but sometimes further medical aid may be necessary after a sting. It is for this reason that patients may be offered immunotherapy, which is usually given over a three to five year period. Around 10% of patients have reactions to the immunotherapy injections during the course, which is why immunotherapy should always be undertaken and supervised by a trained specialist such as an allergist or immunologist.

Minor reactions to wasp or bee stings, such as swelling at the site of the sting, or nettle rash (urticaria), are common and can be treated simply. Such patients do not need immunotherapy.

If you have had allergic reactions to

## Key facts:

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Most allergy clinics will not accept patients for immunotherapy unless they have tried all the usual treatments first.

It is unusual for patients to receive immunotherapy for more than two allergies.

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wasp or bee stings, an allergy specialist's advice may be helpful in deciding whether immunotherapy is necessary, as the classification of reactions is complex.

There is no vaccine available for mosquito bites which rarely, if ever, cause generalised allergic reactions.

## 2. Severe hay fever

Most hay fever symptoms are well controlled with medicines such as nasal sprays, anti-histamines and eye drops. (See our hayfever/allergic rhinitis factsheet). If these measures are effective, then there is no need for immunotherapy. Most allergy clinics will not accept patients for immunotherapy unless they have tried all the usual treatments first and have taken them properly and in the right combination.

Patients often need a combination of medicines to control symptoms:

- Regular steroid nasal spray, started at least 3 weeks prior to the hay fever season (once symptoms have started, it is much harder to control nasal inflammation).
- Regular sodium cromoglycate eye drops.
- Regular steroid inhaler, if you have asthma.
- Regular anti-histamine tablets.

Where these medicines are used appropriately and yet fail to control symptoms, your doctor may recommend other medicines, such as a leukotriene-receptor antagonist, intranasal anti-histamine spray or occasionally, a short course of oral steroids. However, if you have tried the preventive treatment approach outlined above and still need steroid tablets or have very severe symptoms, then you may be a candidate for pollen immunotherapy. In other countries, desensitisation may be used in less severe cases, where the patient prefers this approach to the use of medication. Immunotherapy has been shown to both

reduce the severity of hayfever or rhinitis symptoms and also reduce the need for medication.

## 3. Animal allergies

Avoidance of the allergen is the most important step in preventing allergic symptoms due to an animal. If you keep pets to which you are allergic at home, you will not be considered for immunotherapy as it is unlikely to succeed when there is a background of continuous allergen exposure causing symptoms.

Most people who occasionally come into contact with animal allergens can treat themselves successfully by taking anti-histamines and inhalers prior to contact with the pet. For instance, if going to a friend's house where pets are kept, treatment should be started 30-60 minutes beforehand.

Immunotherapy may be indicated when a highly allergic individual is unable to control symptoms by this strategy and for those who react to the tiny quantities of allergen found on other people's clothes or in public buildings. An allergy specialist's advice is essential in this circumstance, to determine the contribution of the allergen exposure to allergic symptoms. Occupational exposure, such as in veterinary surgeons or nurses, or in patients whose job involves visiting people's homes, may also be considered for treatment.

## Conditions for which immunotherapy is unhelpful

### 1. Multiple allergies

It is unusual for patients to receive immunotherapy for more than two allergies. Where a patient has severe symptoms caused by a number of different allergens (for example nasal symptoms caused by grass pollen, house dust mites, cats and moulds) they may be given immunotherapy for one or two of these so that symptoms are reduced to the level where they can be managed by the usual drug treatments.

## 2. Allergic rashes

Rashes such as eczema and nettle rash cannot be treated with immunotherapy. Research is ongoing into whether certain forms of immunotherapy might be helpful in severe atopic eczema.

## What does immunotherapy treatment involve?

### Screening at an allergy clinic

If you and your doctor think that you may need immunotherapy, you will need to be referred to an allergy specialist. In some areas, this may mean travelling some distance, as not all hospitals have allergy specialists.

You will be asked to have some allergy tests: a skin prick test and sometimes a blood test for allergic antibodies.

You will also need a physical examination to assess your general fitness. It is important that conditions such as uncontrolled high blood pressure and asthma are stabilised prior to commencing treatment. It is sensible to get such problems sorted out before attending the allergy clinic, if possible.

If you are taking a beta blocker (a heart medicine often prescribed for controlling blood pressure) for any reason, you will need to discuss changing this for an alternative treatment.

### If you have asthma

Few asthmatics will be considered for immunotherapy. In general, the more severe your asthma, the less likely it is that you will be considered. This may seem unfair, but the reason is that severe allergic reactions to immunotherapy, although rare, are most dangerous in asthma patients. However, there are exceptions; for example, patients who develop asthma which occurs only in the pollen season can undergo immunotherapy to pollen when it is started well before the pollen season. Patients with asthma and severe allergy to bee or wasp stings can also undergo immunotherapy, as the risk

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of a life-threatening reaction to a sting outweighs the risk of any reactions during immunotherapy. However, it is important that asthma control is carefully maintained to reduce risks.

## If the specialist thinks that you need treatment

You may have to join a waiting list.

Pollen immunotherapy cannot be started during a pollen season. If your hay fever is uncontrolled by standard treatment during the current season, you may need a course of steroids from your doctor to tide you over. It is best to ask for a referral as soon as possible, in order to try and get on to the waiting list sooner. Treatment will need to be started several months in advance of the next pollen season.

Improvement with immunotherapy does not occur immediately. It usually takes at least 6 months before symptoms improve, often longer. It is recommended that immunotherapy is continued for about 3–5 years, to decrease the chance that the allergies will return. Patients undergoing immunotherapy need to continue to use their usual medications until the effects of the immunotherapy are well-established.

## Immunotherapy injections (subcutaneous immunotherapy)

Subcutaneous immunotherapy is the most common type of immunotherapy treatment and involves giving an injection to the patient containing the allergen to which they are sensitised. The injections are usually given as a course of injections of purified allergen extracts, under the skin of the upper arm. The schedule may vary at different hospitals.

At the beginning (induction phase), injections will be given at intervals of a week or less, while allergen doses are gradually increased. Once on the maintenance dose, you will be asked to continue attending for injections every few weeks for at least 2 years. You will be asked to wait in the clinic for one hour after each injection so that if serious side

effects occur they can be rapidly treated. “Rush” immunotherapy is a rapid method of reaching the maintenance dose. Several injections may be given each day, and sometimes this will require admission to hospital. This method is often used in patients with bee and sting anaphylaxis, as speeding up the protocol means the patient will be safer quicker should they be stung again. “Rush” protocols are only used in exceptional circumstances with other allergens, as allergic reactions to this type of treatment are more common.

Individual responses to immunotherapy vary and the duration of your treatment will be tailored to your needs. Skin tests and blood tests may be used to help determine how effective your treatment is.

Itching and swelling are common reactions at the injection site, although many patients experience no reaction at all. For some patients, swelling can increase over hours to days after the injection. Anti-histamine tablets and an ice pack will help ease the swelling in this situation. Some patients have tiredness or flu-like symptoms over the hours following an injection. Avoiding alcohol or strenuous activities on the day of the injection reduces the risk of side effects such as these.

There were some serious reactions to immunotherapy in the past but modern immunotherapy vaccines have a good safety record. The allergen extracts are more highly purified and are administered only by highly experienced specialists in a safe environment.

Some new injection vaccines are becoming available which produce their desensitising effect much more rapidly and can be given as one short course of four injections over 3–4 weeks before the pollen season, with few side-effects and good results. The same technique may also be used for immunotherapy to house dust mites and animals, which would greatly reduce the expense and time-consuming commitment required to undergo current immunotherapy regimes.

## Alternatives to injections - Sublingual Immunotherapy

Sublingual immunotherapy (SLIT) is being used at some specialist centres in children and adults who have airborne allergies. A standard course of this treatment involves a dose of the allergen given as a daily tablet or spray under the tongue, which is increased over time. There is a risk of some mild allergic reactions, but these generally disappear over time, and overall the treatment has shown to be successful in reducing the severity of symptoms and allowing patients to take less medication to control their allergy.

Sublingual drops are becoming more commonly used in specialist allergy clinics but are still not widely available. A tablet version for grass-pollen desensitisation is licensed for use in the UK, and a similar product for house dust mite may be introduced in the near future. Treatment is started in a specialist allergy clinic where the necessary diagnostic tests are carried out and suitable patients can be identified. Once it is established that the treatment is safe for that patient, it can be continued at home by taking one tablet daily. This type of treatment works well and generally has few side effects. The current recommendation is for a 3-year course of treatment but it may be that a shorter course will be shown to be almost as effective. At the moment this treatment is expensive and is not widely used, but availability should improve over time.

SLIT has been shown in large studies to be an effective treatment for allergic rhinitis, but good comparison studies have not yet been done to compare SLIT with injectable immunotherapy. It is very important to take the SLIT medicine regularly (usually daily), and missing out doses will cause it to fail. Therefore, many patients prefer injections as compliance is less of an issue. On the other hand, SLIT is more acceptable to children and adults who dislike needles. Your allergy specialist will be able to discuss your treatment options, as not all forms of immunotherapy are available as SLIT.

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## Clinical contributions:

### Allergy UK Health Advisory Board

Dr Adam Fox, Consultant Paediatric Allergist

### Allergy UK Clinical Team

Amena Warner, Head of Clinical Services

## Additional Resources / References

Hay Fever and Allergic Rhinitis

<https://www.allergyuk.org/types-of-allergies/hayfever/>

Asthma and Respiratory Allergies

<https://www.allergyuk.org/types-of-allergies/asthma-respiratory/>

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