# Evolution of Treating Allergies; Out with Avoidance, In With Early Exposure

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## Abstract

Traditionally, paediatric food allergy management has relied on strict allergen avoidance as the primary strategy to minimize anaphylaxis. Avoidance is effective in reducing immediate reactions and remains a cornerstone of care, particularly where access to specialist services is limited. However, evidence suggests that prolonged avoidance may increase sensitization and allergy severity.

Immunological advances have prompted a shift towards early allergen introduction. This review compares strict food avoidance and oral immunotherapy (OIT). While avoidance minimizes short-term risk, it may not address long-term disease progression. Current evidence suggests that early allergen introduction significantly reduces allergy development and increases reaction thresholds, thereby providing protection against future accidental exposures. However, sustained remission is limited, and an increased risk of certain long-term adverse conditions has been observed. Even so, OIT represents a shift from avoidance towards risk modification

## Introduction

Food allergies affect approximately 5% of young children, with prevalence gradually increasing over the past two decades.[1] Symptoms range from hives and respiratory distress to vomiting and lethargy, with peanut, egg, and shellfish being the most common paediatric food allergens.[2]

Paediatric food allergies can significantly reduce patient and family quality of life, cause considerable anxiety, and impair growth and nutrition.3 Diagnosis and management are complex, as current approaches rely largely on strict avoidance. Combined with parental overdiagnosis, this often results in unnecessary dietary restriction.3 When allergens are excluded without adequate substitution or monitoring, this can adversely affect a child's growth and nutritional status.4 Anaphylaxis is a serious and potentially fatal complication of having an allergy, affecting up to 1.8% of children globally.5

In Ireland, paediatric allergy services remain limited and are often concentrated in tertiary centres, which can delay diagnosis and access to emerging therapies.1 As a result, avoidance continues to be the most widely implemented strategy in routine care.

Current and past allergy management aims to at achieve both desensitization, the temporary state of increased tolerance to an allergen that protect against accidental ingestion while on treatment, and sustained remission, a long-lasting state that allows for the safe discontinuation of treatment and freer consumption of allergens.6 While avoidance has demonstrated clinical benefit and remains the standard approach to management, the persistent risk of accidental allergen exposure highlights an unmet need for therapies that can reduce vulnerability to unintended ingestion.3 Although lifelong tolerance cannot yet be achieved, the emergence of oral immunotherapy (OIT) shows promise in reducing disease burden and improving quality-of-life outcomes in paediatric populations.

## History of Allergies

The most common identified food allergies in Irish children are peanuts (1.7–2%), eggs (3%), and milk (<1%).1 Although the overall prevalence is relatively low, approximately 1 in 20 children with established food allergies experience an accidental severe reaction annually in an educational setting.7

Historically, management has centred on strict allergen avoidance to minimise the risk of anaphylaxis. This approach remains effective in reducing immediate allergic reactions and is relatively simple to implement, particularly in younger children or those with severe allergies. However, evidence suggests that 12-14% of food-allergic individuals experience an accidental allergen exposure, despite efforts of avoidance.8 It is clear that this approach does not modify the underlying immune response. Notably, emerging evidence suggests that accidental exposures following prolonged allergen avoidance can result in more severe reactions.9,10,11

Furthermore, strict avoidance places a significant psychosocial burden on families, requiring constant vigilance and often limiting social participation. These limitations have prompted exploration of alternative strategies that may offer both protection and long-term disease modification.

## Oral Immunotherapy in Practice

Oral immunotherapy is an intervention involving the supervised administration of increasing oral doses of a specific allergen, followed by a maintenance phase of regular exposure.12 OIT can be used prophylactically in infants to reduce allergy development through early, consistent allergen exposure, and therapeutically in older children and adults to achieve desensitization.10

This therapy aims is to induce immunological desensitisation and increase the threshold for clinical reactivity, thereby reducing the risk of life-threatening reactions from accidental exposure.12

The landmark 2015 LEAP trial demonstrated that early peanut introduction significantly reduced allergy development in high-risk infants (Relative reduction of 86.1%) and modulated immune responses in sensitized children (70.0%).13 This provided the first robust evidence supporting intentional early allergen exposure as a preventive strategy, laying the foundation for therapies such as OIT in children with established food allergies, despite limited data on long-term tolerance after cessation.

Currently, the European Academy of Allergy and Clinical Immunology emphasizes that OIT is a preference-sensitive intervention requiring shared decision-making, careful patient selection, and specialist monitoring.14 This is beneficial in the Irish healthcare context where access to paediatric allergy services remains limited and unevenly distributed.1

## Key Implications

Traditional avoidance strategies prioritise minimising exposure risk and are effective in preventing immediate allergic reactions. However, they are associated with ongoing anxiety, reduced quality of life, and sustained vulnerability to accidental ingestion.

In contrast, OIT introduces controlled exposure to allergens, aiming to increase tolerance thresholds and reduce reaction severity. Although OIT does not provide permanent immune tolerance, introducing potential allergens early through immunotherapeutic approaches has reframed management toward risk modification.13,14

Nonetheless, the gradual adoption of immunomodulatory strategies highlights a transition toward more individualised, patient-centred care models in which decisions are guided by clinical suitability and patient preference, rather than the standard avoidance-based approach

## Advantages of Oral Immunotherapy

A key paediatric benefit of OIT is increased allergen tolerance and reduced risk of reactions from accidental exposure; a significant concern for children living with food allergies. The 2022 IMPACT trial findings found that 71% of children receiving peanut OIT were desensitized to high doses of peanut protein compared to just 2% in the placebo group, with the greatest benefit observed in 1–3-year olds.15 Following the 12 month protocol, 74% undergoing OIT tolerated the 600mg challenge compared to the 7% of those maintaining strict avoidance.16

A separate randomized control trial completed in 1-4-year-olds evaluated the efficacy of parent-measured conducted OIT. Long-term follow-up studies indicate that while sustained remission is achieved in only a subset of patients, those who did achieve it experienced fewer and less severe reactions, along with improved health-related quality of life.17 The tolerability of this OIT maintenance protocol supports its long-term use to reduce risk of severe reactions in the event of accidental exposure.

This effect was found to be consistent across other allergens such as cow's milk allergy (CMA)18. One study demonstrated that OIT treated CMA was 10.2 times more likely to achieve desensitization over an avoidance diet.18 While adverse reactions to OIT were relatively common, they were primarily mild, not requiring epinephrine.18

## Disadvantages of Immunotherapy

While significant improvements in desensitization have been achieved with OIT, this therapy is associated with a higher frequency of adverse reactions compared to allergen avoidance.20 Although most documented OIT reactions have been classified as mild or moderate, anaphylaxis can still occur.21 This is particularly important to consider in patients with severe asthma and allergic rhinitis.21

Additionally, OIT has been associated with the development of eosinophilic esophagitis and peripheral eosinophilia.22,23 Given this, OIT is generally not suitable for patients with poorly controlled or severe asthma, active eosinophilic esophagitis, or severe eczema.24 OIT is also not suited for those unable to comply with daily treatments as the effectiveness of OIT relies on consistent, life-long adherence to the treatment.24 Therefore, individuals who miss more than three doses can no longer proceed with the therapy as the risk for severe reactions significantly increases.

The long-term effectiveness of OIT is also debated. A double-blind, randomized controlled trial of patients with peanut allergy found that only 21% maintained remission after OIT, despite an initial 71% achieving desensitization.15 According to current literature, OIT treatment is effective at reaching desensitization, however ongoing treatment is required to maintain this, and few studies have documented long-term remission using OIT.6 While OIT may improve outcomes for paediatric patients, each patient must be assessed individually on their OIT eligibility and educated to reduce external risk factors.

## Further Innovations

Addressing identified concerns surrounding long-term OIT effectiveness, a study investigated the efficacy of using a 30mg daily dose compared to the 300mg standard regimen.25 Upon allergen exposure, comparable tolerance was found, with both providing significant protective effects compared to avoidance. Additionally, 30mg dosing triggered significantly fewer adverse reactions, a promising result for future long-term OIT management.25

Given OIT's severe risk profile, studies have also explored the efficacy of epicutaneous immunotherapy (EPIT). This approach exposes patients to the allergy protein through a daily skin patch, allowing for allergy desensitisation.26 Studies have shown that EPIT is more tolerable and poses a lower risk of systemic reactions compared with OIT, making it the safer option.26,27 Despite EPIT's success with children aged 1-11 years old, the degree of desensitisation achieved is lower than that of OIT.26 Therefore, OIT is still preferred, but EPIT offers an alternative.

Another proposed method of reducing the safety risks associated with OIT is the addition of omalizumab, a mono-clonal anti-IgE antibody, as an adjunct to the therapy. Clinical trials conducted on multiple allergens found that when omalizumab is administered before the commencement of OIT and continued for its duration, the time needed to reach the maintenance phase of OIT and the frequency of adverse reactions were decreased.28

## Conclusion

Over the past decade, the management of food allergies has shifted from strict avoidance strategies towards approaches informed by improved immunological understanding. While strict avoidance effectively minimises immediate risk and remains essential in many clinical settings, it is associated with ongoing anxiety and does not alter long-term disease progression. Conversely, oral immunotherapy offers benefits, such as increased tolerance and improved quality of life, particularly when initiated early. However, adverse reaction risks and issues with sustained remission persist.

In the Irish healthcare context, where access to specialist allergy services is variable, both avoidance and OIT must be considered within the constraints of available resources and patient suitability. As research advances, future care should prioritize shared decision-making, equitable access to specialists, and management strategies that account for clinical risks and family preferences. In turn, the integration of these approaches will ultimately reshape paediatric allergy care on a global scale.

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