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Advantages of early allergen introduction in high-risk infants



Around 3-6% of children in the Western world are thought to be affected by food allergy,¹ and the prevalence is on the rise. In England, food allergy prevalence is thought to have doubled from 2008 to 2018. However, it appears to have plateaued since 2014,² which may be linked to changes in recommendations around allergen introduction into children's diets.

Historically, prevalence of food allergy has been lower in areas where it is common practice to introduce allergens into an infant's diet at an early age, such as the Middle East, Asia and Africa. In contrast, prevalence increased in countries where government guidance stated that allergens, like peanut and tree nuts, should be avoided during pregnancy and early infancy up until more recently (e.g. the UK, USA and Australia).

There is now growing evidence to suggest that early allergen introduction in infants, especially those at high risk, is preventative against developing food allergy later in life. High-risk infants include those with eczema, a family history of allergy or existing food allergies.^{3,4}

Two landmark studies led to a change in UK guidance in 2018:

- **The Learning Early About Peanut Allergy (LEAP) study**³ aimed to determine whether early introduction of peanuts into the diet of high-risk infants (those with severe eczema and/or egg allergy) could prevent peanut allergy. Infants who were introduced to peanuts between 4-11 months of age and consumed them regularly had a lower incidence of peanut allergy at 5 years of age compared with those who avoided peanuts for the first 5 years of life.
- **The Enquiring About Tolerance (EAT) study**⁴ showed a significantly lower prevalence of peanut allergy in infants who had been breastfed and introduced to peanuts prior to 6 months of age, versus infants who were exclusively breastfed until 6 months of age and introduced to allergenic foods thereafter.

What are the current recommendations?

Guidance from the UK National Health Service (NHS) and the Scientific Advisory Committee on Nutrition (SACN) for the general population recommends exclusive breastfeeding for the first 6 months of life and introducing allergenic foods, like egg and nuts, once weaning starts around 6 months of age. The guidelines emphasise that deliberately delaying the introduction of allergens beyond 6-12 months of age may increase a child's risk of developing food allergies.^{5,6}

Like the NHS, the British Society of Allergy and Clinical Immunology (BSACI) recommends exclusive breastfeeding for the first 6 months of life, but gives specific guidance that high-risk infants, such as those with eczema or an existing food allergy, may benefit from the early introduction of allergens (like egg and peanut) from around 4 months of age, alongside other complementary foods.⁷



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How should allergens be introduced into an infant's diet?

Before commencing the introduction of solids, it is important to ensure that the child is developmentally ready to do so. They should have good head control and be able to sit up unsupported. Puréed vegetables, cereals (e.g. baby rice/porridge) and fruit should be introduced first, before attempting to introduce allergens.

BSACI recommends introducing allergens in the order shown in Table 1.

Allergens should be introduced one at a time into the diet, when a child is well, in the first half of the day and ideally at least 2 hours before a nap (to allow sufficient time to assess for any possible reactions). A small portion size (e.g. a quarter to a half of a teaspoon) should be given initially, which can then be increased daily over 3-4 days until the child can tolerate a portion size equivalent to the size of their palm. The next allergen can then be introduced.

For parents adopting a more 'baby-led weaning' approach, allergens can be offered as finger foods, e.g. strips of omelette/pieces of well-cooked scrambled egg or smooth peanut butter on rice cakes.

Whilst introducing allergens early is important, it is crucial to ensure that these allergens are then included in the diet regularly, so that the child remains tolerant of them. Introducing the allergens early and then failing to maintain regular exposure could, in fact, increase a child's risk of developing an allergy to this food. A heaped teaspoon of peanut butter a few times a week should be sufficient to maintain tolerance.³

Ideally, all of these allergens should be introduced before 12 months of age. However, for those infants at high risk of developing food allergy, evidence suggests the greatest preventative effect is achieved through allergens being introduced within a 'window of opportunity' between the age of 4 and 6 months.⁷

Table 1: Allergens to be introduced and how to introduce them








Allergen	How to introduce
Egg 	Use British Red Lion-stamped eggs. Introduce boiled egg, omelette/scrambled egg blended with formula milk or mashed into a purée of foods that are already tolerated.
Peanut 	Smooth peanut butter (ideally 100% nut butter without added salt/sugar) can be added to purées, porridge etc. Alternatively, puffed peanut snacks can be ground and added to the same foods. Whole nuts, crunchy nut butters, or crushed nuts are not suitable for infants under the age of 5 years and should be avoided as they are a choking hazard.
Tree nuts 	Includes cashew, almond, hazelnut, walnut. Pure, smooth nut butters should be used where available, or the nut can be finely ground to a powder and added into purées/family foods. Again, whole or coarsely chopped nuts should be avoided.
Cow's milk 	If a child has been exclusively breastfed, cow's milk can be introduced via dairy yoghurt (look for no added sugar options) or fresh cow's milk mixed into porridge or mashed potato.
Wheat 	Can be introduced using cereals like wheat biscuits, bread, pasta, cous cous, bulgar wheat etc.
Sesame 	Introduce using tahini (sesame paste) mixed into veg/fruit purées or porridge, or choose hummus (if child is already tolerating chickpea).
Fish/seafood 	Aim to try at least one white fish (e.g. cod/sea bass) and one oily fish (e.g. salmon). Prawn or crab are often the easiest way to introduce shellfish. These can be puréed either on their own, with vegetables, or mashed potato.

Table adapted from BSACI's *Preventing food allergy in your baby: A summary for parents*⁷

Considering ethnic/cultural preferences when advising on early allergen introduction is key. In some cultures, it is not common practice to begin weaning prior to 6 months of age, therefore clear education around the benefit of early allergen introduction in high-risk infants versus the risks of delayed allergen introduction is important within these groups. There are also some cultures where nuts are not frequently used in everyday foods, so advice will need to be given on how the nuts can be incorporated into traditional foods. Interpreters should be used to address language barriers where appropriate.

It is also important to acknowledge financial circumstances when giving advice on introducing allergenic foods. Branded pure nut butters, for example, can be expensive. Many supermarkets now offer their own brand 100% nut butters which can be a more affordable option. Nuts can also be ground using a pestle and mortar or a rolling pin – a food processor is not essential.

Tips for introducing allergens where a child is 'picky'

- Mix the allergenic food into a tolerated food that the child likes to eat regularly, e.g. mashed potato, a tomato-based pasta sauce, yoghurt, or pancakes.
- Repetitive exposure is key – it can take 10-15 exposures to a new food/flavour before it is accepted.
- Peanut puff crisps can be a good method for introducing peanuts into the diet if peanut butter is not tolerated. They can however have a high salt and sugar content, so should be used sparingly for infants.
- Once the individual nuts have been introduced and tolerance has been confirmed, a nut mix powder/mixed smooth nut butter can be made and added to everyday foods to avoid having to give each nut separately, multiple times a week
- For maintaining nut exposure in older children who are picky, consider adding crushed nuts to meatballs/burgers, mixing into breadcrumbs to coat chicken/fish, or using nut butters in homemade muffins and biscuits.

How can I help anxious parents to introduce allergenic foods into their child's diet?

Parental anxiety around introducing allergens is very common, especially where there is a family history of food allergy, or if the child has eczema. Whilst delaying allergen introduction might feel more comfortable to a parent, it is important to discuss the risks of delaying their introduction.

Anxiety often arises where a parent or a sibling has an existing food allergy. Whilst an immediate family history of food allergy can put the child at greater risk of developing food allergy, this allergy will not necessarily be inherited by the child directly. If one of the child's parents has an allergy to the food being offered, it can be helpful for someone else to lead on the introduction of this food, such as the other parent, a grandparent, or another trusted family member.

Providing advice on how to minimise cross-contamination at home, e.g. thorough hand washing, wiping down surfaces properly and using separate cutlery/crockery to serve the allergenic foods, can help families to feel more prepared if a parent/sibling is allergic to the food being offered.

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What happens if the child reacts to an allergen?

Children may react when first introduced to a new allergen. Most infants will not present with a life-threatening reaction, but they may develop hives/an urticarial rash (raised, bumpy rash), vomiting or swelling of their lips, face or eyes. As per the British National Formulary (BNF), an over-the-counter antihistamine can be given if required.

If the child has had an IgE-mediated (immediate) reaction to the allergen (see Table 1 below), they should be referred to their local Paediatric Allergy Clinic. The allergen should not be given to the child again until they have seen an Allergy Specialist.

Children with suspected non-IgE mediated food allergy, such as delayed cow's milk allergy, should ideally be referred to their local Community Paediatric Dietitian service for support with conducting a formal exclusion diet. The suspected allergenic food should be removed from the diet for around 2-4 weeks to see if symptoms improve, and then should be re-introduced to see if symptoms worsen again.⁸

Whilst introducing allergens early is important, it is crucial to ensure that they are then included in the diet regularly to maintain tolerance.

It is uncommon for infants to have severe reactions affecting the airways, breathing or consciousness; however, if any symptoms of this nature do occur, emergency medical assistance should be sought immediately.

Often, when a child has reacted to one allergenic food, they are mistakenly advised to avoid all other allergenic foods. Whilst this might appear to be the 'safer' option, it may actually increase this child's risk of developing allergies to other foods. It is therefore important that parents proceed with introducing other allergenic foods with the help of an Allergy Specialist.

There are some contraindications, e.g. if a child has reacted to cashew, then pistachio should not be subsequently introduced as there is cross-reactivity to the structure of the proteins of these two nuts. Similarly, if a child has reacted to walnuts, then pecans should be avoided.

Some children with cow's milk allergy will also react to soya. However, a child should only avoid soya if they develop symptoms when consuming it, e.g. soya yoghurt, soya milk, edamame etc.

Table 2: Presentation of IgE-mediated reactions

IgE-mediated reactions	
Timing	Usually occur within 30 minutes of ingesting the allergenic food, but can occur up to 2 hours afterwards
Symptoms	Mild-moderate symptoms include: <ul style="list-style-type: none">• Itchy skin rash/hives• Vomiting• Swelling of lips, face, eyes• Abdominal pain Severe symptoms (known as anaphylaxis): Airways <ul style="list-style-type: none">• Persistent cough• Hoarse voice/cry• Difficulty swallowing• Swollen tongue Breathing <ul style="list-style-type: none">• Difficult/noisy breathing• Wheezing Consciousness <ul style="list-style-type: none">• Persistent dizziness• Pale or floppy• Suddenly sleepy• Collapse/loss of consciousness

Are there any groups of children where this approach would not be recommended?

Whilst infants with eczema are at high risk of allergy and hence would benefit from early allergen introduction, it is important that uncontrolled eczema (i.e. widespread, itchy, or weeping eczema) is treated with the help of a specialist before allergens are introduced.⁷ Uncontrolled eczema can make it difficult to assess skin reactions when allergenic foods are introduced.

Caution should also be taken when considering early allergen introduction in infants born prematurely. Introducing solids at the age of 4 months (actual age and uncorrected) is not usually suitable for a preterm infant, as they are unlikely to be developmentally ready. Once the infant has demonstrated good head control and is able to coordinate movements from their hands to their mouth, weaning can commence.

Conclusions

Early allergen introduction in an infant's diet, particularly in high-risk infants, is key to preventing food allergy. Paediatric Dietitians play a pivotal role in facilitating timely allergen introduction, helping to address parental anxiety around introducing allergens, and advising on practical ways to ensure regular exposure to allergenic foods once they have been introduced. 🖐️

Useful resources:

- BSACI – Preventing food allergy in higher risk infants: guidance for healthcare professionals
- BSACI – Preventing food allergy in your baby: A summary for parents
- NHS Start for Life – www.nhs.uk/start-for-life/baby/weaning/safe-weaning/food-allergies

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