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## Appendix 1: Home introduction of baked (i.e. well cooked) egg as an ingredient, for children with a history of egg allergy

### Background

For children who have had a previous mild reaction to egg (e.g. facial rash or vomiting, but NOT wheezing, throat tightening or floppiness), it is appropriate to try reintroduction of baked egg products at home. Most children with egg allergy grow out of it in early life. Raw or uncooked egg is more likely to cause allergy than cooked egg. As the allergy resolves with time, many children will start to tolerate well cooked (baked egg products) followed by lightly cooked whole egg (e.g. scrambled egg) then finally uncooked whole egg. This protocol informs parents how to perform the egg challenge at home. Children who have had more severe symptoms may need to have a challenge performed under hospital supervision. Your doctor will advise when it is appropriate to try each stage of reintroduction. Use the following information only as a guide. There may be variations for individual children, which your doctor will explain. Text box (A1).

### Protocol for cooked egg re-introduction at home

1. Postpone the reintroduction if your child is unwell.
2. Have oral antihistamines available.
3. Bake a fairy cake containing egg, ensure that the other ingredients of the cake are tolerated, e.g. cow's milk. (Suggested recipe: 1 egg, 4 oz self-raising flour, 4 oz margarine, 4 oz caster sugar to make eight cakes).
4. Begin by rubbing a small amount of cake on the inner part of your child's lips.
5. Wait for 30 min and allow your child to continue normal activities.
6. Signs of an allergic reaction may include: Itching, redness, swelling, hives (nettle-sting type rash), tummy pain, vomiting or wheezing.

Text box (A1). The following children will need a supervised challenge in hospital (day case):

Children with previous egg allergy symptoms that affected breathing (cough, wheeze or swelling of the throat, e.g. choking), the gut (severe vomiting or diarrhoea) or the circulation (faintness, floppiness or shock)  
Children who also receive regular asthma preventative treatment and/or have poorly controlled asthma

7. If there have been no symptoms, give your child a pea-sized amount of cake to eat.
8. A day or two later, if there have been no symptoms; give your child twice the amount of cake to eat.
9. Repeat stage 8 until the cake is finished. Symptoms usually occur up to 2 h after the last dose (worsening of eczema may occur after some hours, or the next day). This can then be repeated using a two-egg recipe (with 4 oz flour, sugar and margarine).
10. If symptoms occur then, do not give any more cake. Give a dose of antihistamines (according to the label) by mouth. Consider attempting reintroduction again in six months time and discussion with your doctor.
11. If the cake has been tolerated, then your child should eat this regularly. Try other foods containing well-cooked egg, e.g. biscuits, pasta. Do not worry if your child does not like to eat egg products – this is quite common.

## Appendix 2: Home introduction of lightly cooked whole egg for children with a history of egg allergy

### Background

This information sheet is for children who can already tolerate well-cooked egg as an ingredient (e.g. in cakes) and wish to introduce lightly cooked whole egg at home. Do not use this protocol if your child has had a previous severe reaction to egg. Your doctor will advise you when it is appropriate to try this.

1. Postpone the reintroduction if your child is unwell.
2. Have oral antihistamines available.
3. Cook a portion of scrambled eggs, but ensure that other ingredients are tolerated, e.g. cow's milk.
4. Begin by rubbing a small amount of egg on the inner part of your child's lips.
5. Observe for 30 min, allow the child to continue normal activities.
6. Signs of an allergic reaction may include: Itching, redness, swelling, hives (nettle-sting type rash), tummy pain or vomiting.
7. A day or two later, if there have been no symptoms; give your child a small bite of scrambled egg to eat.
8. Repeat stage 7 with increasing amounts of scrambled egg at intervals of several days until a whole portion is finished. Symptoms usually occur up to 2 h after the last dose (worsening of eczema may occur after some hours, or the next day).
9. If symptoms occur, then do not give any more egg. Give a dose of antihistamines (according to the label) by mouth. Consider attempting reintroduction again in 6 months time and discussion with your doctor.
10. If all of the doses have been tolerated, then your child should continue to eat lightly cooked whole

egg. Try similar foods, e.g. boiled egg. Do not worry if your child does not like to eat eggs – this is quite common.

## Appendix 3: Patient information sheet – hen's egg allergy

### What is egg allergy?

Egg allergy is caused by an allergic reaction to egg protein. This protein is found mostly in the egg white but also in the yolk. It is common in children under 5 years and usually first noticed in infancy when egg is introduced into the diet for the first time. It is rare for egg allergy to develop in adulthood. Those who develop egg allergy as adults may also be allergic to birds or feathers that contain a protein, which is similar to that found in egg yolk.

### What are the symptoms?

Most reactions are mild. Commonly infants refuse the egg-containing food, develop redness and sometimes swelling around the mouth soon after skin contact and then vomit after eating. Stomach ache or diarrhoea may also occur. Rarely, some children also develop a more severe reaction with cough, an asthma-type wheeze or even anaphylaxis. Further reactions do not, as a rule, become increasingly severe unless a greater amount or a less well-cooked form is eaten; accidental reactions are almost always milder than the original. Accidental skin contact usually only causes a rash but no generalized or dangerous symptoms; severe reactions rarely occur unless egg is eaten.

Egg allergy may also be responsible for worsening of eczema, but this is usually more difficult to diagnose given the slower time to onset of symptoms.

### Will the allergy resolve?

Egg allergy will resolve in most children, usually by school age. Generally, as they grow out of it, children tolerate well-cooked egg (e.g. cakes) first, followed by lightly cooked (e.g. scrambled eggs) before finally being able to eat raw egg. Children who have had more severe reactions (e.g. with wheezing) may take longer to grow out of their allergy and in some cases egg allergy will persist.

### How is egg allergy diagnosed?

The diagnosis of egg allergy is based on the history of previous reactions, and can be confirmed by skin tests or blood tests.

### What is the treatment?

The best current treatment is to avoid all food containing egg for 1–2 years, allowing the allergy time to resolve. Egg may be found in a wide range of foods, including: cakes, pastries, desserts, meat products, salad dressings, glazes, pasta, battered and bread crumbed foods, ice cream, chocolates and sweets. It may also be referred to by unusual terms especially on imported foods e.g. egg lecithin or albumen (= egg white). The proteins in eggs from other birds are very similar to those

**Text Box (A3). Products useful for an egg-free diet**

Egg-free products include	Egg-free mayonnaise Egg-free cakes and muffins Egg-free puddings Egg-free omelette mix
Whole egg replacers	Whole egg replacer (Allergycare) Ener-G egg replacer (General Dietary) Loprofin egg replacer (SHS) No-egg replacer (Orgran)
Egg white replacer	Loprofin egg white replacer (SHS)

in hens' eggs and should be avoided too. This list is not exhaustive and because ingredients can change, food labels must be read carefully every time you shop. Text Box (A3).

Lists of egg-free foods can be obtained directly from many food manufacturers and supermarket chains. They are very helpful in the day-to-day management of the diet.

You should also obtain antihistamine syrup (available without prescription) and keep this available at mealtimes. Your doctor may provide an adrenaline injection, but children with egg allergy would only require this if they were considered to be at high risk of a severe allergic reaction, which is unusual. If you are provided with an adrenaline injection your doctor will show you how to use it and provide a treatment plan. You should keep a copy with your child's medication and also give copies to others, e.g. nursery/school teachers and grandparents. You should also provide emergency medication for your child's school or nursery, which your doctor can prescribe.

After a period, your doctor will provide advice on egg reintroduction. Your doctor may want to perform an allergy test on your child's blood or skin (these tests are safe), or may ask you to begin introducing well-cooked egg at home. Advice sheets are available to help you introduce egg.

If your child has had more severe reactions involving wheezing, the decision whether to reintroduce egg will be made by an allergy specialist.

**Can my child have their routine immunizations?**

All children with egg allergy should receive their normal childhood immunizations, including the MMR vaccination as a routine procedure performed by their family doctor/nurse. MMR is *not* grown on hen's egg, as widely believed. Studies on large numbers of egg-allergic children show that there is no increased risk of severe allergic reactions to the vaccine.

As with other vaccines, MMR should be postponed if children are unwell. Adrenaline should be readily available at the clinical site in all cases because anaphylaxis, although rare, can occur.

If previous vaccination (MMR or other) resulted in a severe allergic reaction (any breathing problems or collapse), then the child should be seen by an allergy specialist before further immunizations are given.

**What about other immunizations?**

Influenza vaccine is prepared on hen's egg and may contain small amounts of egg protein. There is a risk of anaphylaxis in people with severe egg allergy and they should see an allergy specialist to assess the risk. People who can eat moderate amounts of egg can have the vaccine even if they have had an allergy to egg in the past and even if their allergy tests for egg are still positive.

Yellow fever vaccine contains measurable amounts of egg protein and people with egg allergy who need it should be seen by an allergy specialist.

**Can I continue to breastfeed my baby?**

If you are breastfeeding, any food proteins, such as egg, will also be present in your breast milk. If your baby is well, with no allergic symptoms, then it is fine for you to eat egg as normal. If your baby has symptoms, such as eczema or rashes, which may be due to an allergy to the egg in your milk, then it may be worthwhile removing egg from your own diet for a couple of weeks to see whether your baby's symptoms improve. If there is no improvement in your baby's condition, then eggs can be re-introduced back into your diet.

**Does egg allergy mean my child is at risk of other allergies?**

Most children with egg allergy will already have a history of eczema. Egg allergy also increases the risk of developing asthma later in childhood, but not in all children. Allergies to other foods are more common in egg-allergic children.

**I have another child/infant to whom I have not given egg. When should it be introduced into their diet?**

The Department of Health recommends that egg should be introduced into the weaning diet from 6 months onwards. There is no evidence to suggest that delaying the introduction of egg beyond 6 months will reduce the chance of your child developing egg allergy.