

Reintroduction of food after elimination diet.
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Dietary elimination is one of the more tried and true treatments for EoE. Across numerous studies, it has one of the highest reported success rates, and carries the added advantages of safety and long-term results^{1,2}. Many patients have successfully induced a remission of eosinophilic esophagitis (EoE) by restricting their diet of certain foods. The restriction may have been based on the results of allergy testing, or may have been based on eliminating the most common foods that cause reactions, such as the “Six Food Elimination Diet” first reported by Drs. Kagalwalla and his colleagues in Chicago³. Or, perhaps they have undergone a complete elimination diet by exclusively taking an elemental formula until the inflammation in the esophagus has resolved. Regardless of what method is used to get to this point, the next steps are equally important.

What is most important to keep in mind is that any dietary restrictions necessitate a lot of sacrifice on the part of the patient and their family. It would be a shame to undo all of the progress that has been made by taking a haphazard approach to reintroducing foods. Although the best way to move forward after a dietary restriction will be different for each patient, there are some questions and principles that pertain to many people with EoE. With that in mind, here are some common questions and recommendations.

1. What foods should be introduced first?

Food choices should be made using common sense and the best available information. For instance, if there were a food that was always suspected to be a culprit because it caused symptoms when it was eaten, then that would not be the best food to introduce first. If successful food elimination was based on the results of allergy testing, then it may be advisable to try and introduce foods that resulted in smaller or borderline reactions before foods that resulted in very large reactions. There also are foods that are statistically more likely to be problematic (when looking at the whole population) than others, although this does not hold true for everyone. These may be foods that are best introduced later in the process, but keep in mind that just because many people with EoE have a reaction to milk, not everyone does. The same holds true for each and every food. Choosing the order that foods are introduced can be a challenging decision, and one that should be made with the advice of your EoE specialists including gastroenterologists, allergists, and dietitians.

2. How much of the food should be taken, and for how long?

When a food that has been eliminated from the diet is reintroduced, the reaction can be severe. For this reason, it is usually recommended to start with a small amount of the food in question and gradually increasing the amount of exposure over a period of many days. If there is a possibility of an anaphylactic type reaction (a question that should be answered before attempting any food introduction), then the first exposure to the food may need to be in a monitored setting such as a physician office, and there should be preparations made beforehand for the possibility of a severe reaction (such as Epi-pen training). It is common in EoE for food reactions to be delayed hours or even days from exposure. To address this, introducing one new food per week allows adequate time to detect a reaction before potentially confusing the picture by introducing another food. Symptoms of a failed food

trial may range from mild reflux symptoms or pains, to severe cramps, vomiting, or difficulty swallowing; even food impaction. In general, it would be expected that symptoms mimic the symptoms that led to the initial diagnosis, although that is not always the case. Any noticeable change after introducing a food should be noted and considered possible evidence of a reaction.

3. If food(s) are reintroduced and symptoms do not recur, does an endoscopy need to be performed?

It is clear that symptoms do not always correlate with the presence of eosinophils in the esophagus. That is why an endoscopy is an essential part of the evaluation after reintroducing food(s). Usually, the endoscopy is scheduled for at least 4 weeks after the food introduction. An important decision that needs to be made is how many foods to introduce prior to performing the endoscopy. Performing an endoscopy after each new food is introduced has the advantage of definitively evaluating for disease relapse after each food. The disadvantage is that it subjects the patient to many endoscopies. Introducing several foods before the endoscopy limits the number of endoscopies that are necessary, but if the results are abnormal, it is impossible to tell which food(s) are responsible for the disease relapse. In general, it is advisable to avoid introducing more than 3 or 4 foods before performing an endoscopy, but if there is a food that is identified as particularly important, it is reasonable to perform an endoscopy after that one food.

4. How much of an issue is cross-contamination and non-protein food products?

When doing a food elimination, it is important to be aware of the potential for cross-contamination with other foods. Patients with anaphylaxis to foods, such as those with severe peanut allergy, have been trained to avoid any foods processed where there is the possibility of cross-contamination, as even miniscule amounts of the food protein can lead to a severe reaction. It is less clear that cross-contamination can cause persistent symptoms or inflammation in EoE. However, it is prudent to maintain a diet as free from any potential contamination as possible. As difficult as it is to adhere to the dietary restrictions necessary in EoE, it would be a terrible waste not to reap the benefits due to a small amount of contamination. Another controversial area is the use of products that are derived from potentially allergenic foods, such as corn syrup and soy lecithin. Again, it is not entirely clear whether these foods have to be avoided. In general, corn syrup contains only very highly refined carbohydrate, and the risk of a reaction due to contamination with corn protein is very low. In most cases, patients with a corn allergy that causes EoE can safely take corn syrup, but there are isolated patients who may react to even the smallest amount of corn that remains in the corn syrup. Likewise, soy lecithin and soybean oil are often safe in those with soy allergy, but there may be isolated patients who react. In those patients who have unexplained recurrence of their disease or who have persistent problems on dietary restrictions, it would be advisable to re-evaluate whether these types of ingredients could be a cause of problems.

5. Do people outgrow allergies, and do other allergies emerge over time?

There are a limited number of studies that determine whether or not people with EoE outgrow their allergies. We know that a proportion of patients with childhood allergies tend to outgrow them over time, especially infants with milk and soy allergy. We also know that certain types of food allergies, such as anaphylaxis to peanut, tend to persist. The successful

reintroduction of foods may imply that someone has outgrown an allergy, but could also reflect that the allergy test that led to the restriction was not accurate. Even if an attempt at introducing a food is unsuccessful, there remains a chance that the food can be reintroduced at a later date. In general, a waiting period of at least 6 months is needed, and chances are that the time period before a successful reintroduction will be longer, if the food can be reintroduced at all. And, although it is generally expected that allergies improve with time, an allergy to a food can develop at any point. The unexpected recurrence of symptoms after dietary elimination should prompt the consideration of new allergy, and perhaps repeat allergy testing if none has been done for a while (a year or more).

Should everyone with EGID be on a restricted diet?

Dietary elimination is not necessarily the right treatment for everyone. Some people find the lifestyle too restrictive, and although there are some clear benefits to this approach, there are definite limitations as well. However, when someone can get through the initial restriction and achieve a remission of disease as measured by both resolution of symptoms and inflammation on endoscopy, there exists the possibility of slowly expanding the diet. Proceeding in a systematic fashion and following some of the principles outlined above will increase the likelihood of long term success.

1. Liacouras CA, Spergel JM, Ruchelli E, Verma R, Mascarenhas M, Semeao E, *et al.* Eosinophilic esophagitis: a 10-year experience in 381 children. *Clin Gastroenterol Hepatol* 2005;3:1198-206.
2. Markowitz JE, Spergel JM, Ruchelli E, Liacouras CA. Elemental diet is an effective treatment for eosinophilic esophagitis in children and adolescents. *Am J Gastroenterol* 2003;98:777-82.
3. Kagalwalla AF, Sentongo TA, Ritz S, Hess T, Nelson SP, Emerick KM, *et al.* Effect of six-food elimination diet on clinical and histologic outcomes in eosinophilic esophagitis. *Clin Gastroenterol Hepatol* 2006;4:1097-102.