

Peanut Allergy: **How Much Peanut is Too Much?**

By Michael Goldman, M.D.

Peanuts are one of the most common foods to cause allergic reactions in both children and adults and are the most common cause of fatal food allergic reactions. In peanut allergic individuals, accidental ingestion of peanut products can produce any or all of the following symptoms: hives, itching or swelling of the mouth and throat, tightening of the throat, sneezing, chest tightness, cough, shortness of breath, stomach upset, vomiting, drop in blood pressure, loss of consciousness, and even death.

Once the diagnosis of peanut allergy has been made (by a history of a reaction and/or confirmed by allergy testing), the mainstay of treatment is avoidance. If an accidental ingestion occurs, experts recommend rapid treatment with early use of epinephrine to prevent drastic outcomes. Each peanut allergic individual should have an action plan developed with his/her physician in case of accidental peanut ingestion.

The question many parents, caregivers and peanut allergic individuals themselves want to know is "how much peanut is too much?" The short answer is that any amount is too much. Microscopic quantities of peanuts may be enough to produce a reaction in some individuals. It is important to read all ingredients and to avoid obvious sources of peanut protein such as peanut butter and peanut flour. It is equally important to avoid "hidden" sources of peanuts as in baked goods, candies and certain ethnic foods (Thai, Vietnamese, Chinese and Mexican) that tend to use peanuts, peanut butter or peanut flour as ingredients in many dishes. Do not forget about cross-contamination of other foods with peanut protein. The jelly jar that is used with a knife containing peanut butter may contain enough peanut to produce a reaction.

Two recent studies published last year in the *Journal of Allergy and Clinical Immunology* underscore how small quantities of peanut protein can produce a reaction. In the first, twelve adult peanut allergic individuals were given capsules with increasing amounts of peanuts. One patient reacted to 16 mg of defatted peanut, which is equivalent to 1/27 of a peanut. The other eleven patients reacted to between 100 and 4000mg of defatted peanut (1/4 to 9 peanuts). However, since the peanuts were in capsules, they bypassed contact with the mouth and throat and so probably did not simulate the typical peanut ingestion. The second study was a closer approximation of "real life" ingestion. Fourteen peanut allergic individuals were given increased amounts of peanut protein in the form of peanut flour mixed in rice pudding. Three patients reported mild symptoms (warm feeling in the throat, lip tingling) at 0.1 to 0.25 mg of peanut protein. By my calculations, this is approximately equivalent to eating 1/2000th to 1/800th of a peanut. Five other patients had similar symptoms after ingesting 1 to 10 mg doses of peanut protein (1/200th to 1/20th of a peanut). One patient had lip swelling, hives, vomiting and wheezing after ingesting a total of 9 mg of peanut protein (~1/20th of a peanut). Five patients had no reactions after eating 90 mg of peanut protein (one-half of a peanut), the maximum dose in this study, suggesting that higher doses would be required to induce their symptoms.

What conclusions can we make from these two studies? First, minute quantities of peanut can produce symptoms. Second, the higher the dose ingested the more likely a reaction. Finally smaller quantities ingested by a single individual may produce milder symptoms while larger quantities are more likely to produce severe symptoms. However, these "larger quantities" can still be a fraction of a single peanut. I never recommend taking a "test bite" of a cake or candy for that one small bite may have dire consequences.

Careful avoidance of all potential sources of peanut protein is essential to prevent a reaction. However, accidents are likely to occur. In a study of 32 peanut allergic individuals at the National Jewish Center for Respiratory Diseases, three-fourths had accidentally eaten peanuts in the previous five years, with one-half in the preceding year. It is vitally important that all peanut allergic patients have an action plan in place to deal quickly with such an accidental ingestion. Most (if not all) peanut allergic patients should have epinephrine (EPIPEN, EPIPEN-Jr., Anakit) readily available to treat these potentially life threatening reactions. For peanut allergic children, caregivers (parents, grandparents, teachers, school nurses and babysitters, etc.) need to be aware of the seriousness of the condition and instructed what to do if an accidental ingestion occurs. It is my firm belief that all fatal reactions to food allergies can be prevented with careful avoidance and rapid use of epinephrine for accidental ingestion. You should discuss your specific action plan with your physician.

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