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Food allergies on vacation- there and back again

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Abstract

Objective: Food allergy (FA) is an important public health concern that impacts all facets of life, and travel is no exception. We sought to provide a scoping review regarding the literature pertaining to management of food allergy while travelling.

Data Sources: Medline and Embase were queried for English language articles published in the last 20 years containing “food allergy” AND “travel.”

Study Selections: The search produced 83 references which were reviewed. Following removal of duplicates and irrelevant material, 23 references that discussed travel and food allergy remained, 13 of which were conference abstracts published as supplemental material

Results: Priorities for consideration by patient-families and their Allergist/Immunologist include concern for reactions away from home, proximity to emergency medical services, risk for various methods of travel including potential for cross-contact exposure resulting in symptoms, and considerations for international travel including language barriers.

Conclusion: Patients with FA must utilize careful planning and preparation to ensure access to safe food and emergency medications at all times while away from home.

Keywords

Food allergy; Travel; Anaphylaxis; Airlines

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Introduction

Food allergy (FA) is an important public health concern that impacts more than 30 million adults and children in the United States^{1,2}. FA prevalence appears to be increasing and may be lifelong^{3,4}. FA is responsible for significant economic and emotional burden for patients and families and can impact every aspect of life for a patient-family, and travel is no exception.⁵⁻⁸

While patient-families managing FA who travel employ their usual techniques to remain safe at home and familiar environments, leaving home either domestically or abroad presents potentially unique challenges. A questionnaire study found that 68 percent of patients managing FA limit their vacation destinations, with 90 percent saying they travel only domestically in the United States and many avoid certain types of transportation such as airplanes.⁹

To further explore the impact of FA on travel and considerations for the allergist/immunologist related to patients managing FA during travel, a scoping literature search was conducted. Medline and Embase were queried for English language articles published in the last 20 years containing “food allergy” AND “travel.” The search produced 83 references which were reviewed. Following removal of duplicates and irrelevant material, 23 references that discussed travel and FA remained, 13 of which were conference abstracts published as supplemental material (Figure 1). Several themes emerged as priorities for consideration by patient-families and their Allergist/Immunologist including concern for reactions away from home, proximity to emergency medical services, risk for various methods of travel including potential for cross contact exposure resulting in symptoms, knowledge of FA in unfamiliar environments, and considerations for international travel including language barriers (Figure 2).

Rates of anaphylaxis away from home

Travel, as with other unfamiliar environments, can be more difficult for those who live with FA and their families. A qualitative study of adults with FA noted frustration and difficulty with travel, often resulting in limiting activities and choices of destinations (to remain close to medical facilities).¹⁰ The adults surveyed described that FA played a “key role” in their choice of holiday destination. While less described specifically for travel, if extrapolating from the data regarding allergic reactions in restaurants and schools, anaphylaxis has been described as more likely to occur outside of the home.¹¹ A voluntary registry of individuals with peanut and/or tree nut allergy found that reactions due to accidental exposure to peanut or tree nut were more likely outside of the home, and in general were more severe reactions.¹¹ In the US peanut and tree nut registry, 13.7% have reported reactions within restaurants or other dining venues outside the home.¹² Various measures can be taken in advance to help mitigate the risk of accidental exposure and allow persons with FA and their families to travel safely.

Risk for methods of travel

Air travel is often associated with significant anxiety among persons with FA and their families.¹³ On the airplane, having food-safe and nonperishable foods that can be ingested prevents an accidental exposure while flying.¹³ Families should carry with them multiple unexpired epinephrine autoinjectors as well as an anaphylaxis action plan. While the Air Carrier Access Act (which covers all United States and many international flights) requires epinephrine on board, it can only be administered under the guidance of a trained medical professional.¹³ If an allergic reaction occurs while on board, any physicians on board may be helpful in managing the reaction and providing input on whether the plane should be diverted.¹⁴ Remote access to medical services and providers is another option until the plane can be landed in a location with access to medical care.¹⁴ While stock epinephrine on airlines has been shown to be cost effective,¹⁵ it may be absent when needed. All major airlines have policies for allergic passengers, but the policies can vary quite significantly.¹⁴ These include pre-boarding accommodations (buffer zones, ability to request allergen free meal, pre-boarding wiping of seats and table trays), as well as policies while on-board (announcements that there is a passenger with allergy on board, allergen free snacks or meals provided).¹⁴ In addition, airlines differ with respect to labeling of nonpackaged goods.¹³ A knowledge of specific airline policies is necessary prior to travel.

Cutaneous and inhalational contact with allergens

A common concern among travelers with FA is the risk of cutaneous or inhalational contact with allergens while onboard a plane. Several studies have documented reactions while in-flight, although there are limitations including a reliance on self-report.^{13,14,16} In contrast, many other studies have not demonstrated a significant risk associated with airborne or cutaneous peanut exposure.^{17–19} In one randomized, double-blind placebo-controlled study of children with peanut allergy, there was no systemic reaction from inhaling peanut at 12 inches from the nose nor from having peanut butter rubbed on the surface of the skin.¹⁸ Allergy societies have endorsed that it is in general oral ingestion that is required to trigger a systemic reaction to a food.²⁰ There is a theoretical risk that peanut protein on surfaces such as the seating area and tray well could be accidentally ingested, resulting in a reaction.¹³ As a result, careful cleaning of the seating area and tray is recommended on any flight.¹³

Safety measures

Food labeling laws—When purchasing foods internationally, an understanding of food labeling laws is essential to prevent accidental ingestion. Labeling laws differ with respect to which allergens are mandatory for labeling, and which terms are used for labeling.²¹ Prior to travel, investigating the local labeling requirements allows for safe purchase of foods while traveling. For example, in the United States, the Food Allergen Labeling and Consumer Protection Act of 2004 (FALCPA) mandates that milk, eggs, fish, crustacean shellfish, tree nuts, peanuts, wheat, and soybeans be preceded by the word “contains” in the ingredient list.²² The Food Allergy Safety, Treatment, Education, and Research (FASTER) Act of 2021 declared sesame as the 9th major food allergen. Effective January 1, 2023, sesame products will be subject to the same food labeling regulations of FALCPA as applied to the original “top 8” allergens.²³ In the European Union, the following additional foods

are mandated for disclosure on food labels: celery, mustard, lupin, mollusks, and sulphur dioxide and sulphites at concentrations of more than 10 mg/kg.²⁴ Authorities in Australia in New Zealand mandate declaration of lupin, sulphites, bee products (bee pollen, propolis, or royal jelly)²⁶, in addition to the top 8 allergens and sesame. Among countries in Asia, South Korea has the most expansive list of mandated allergens for declaration, with the additional inclusion of buckwheat, mollusks, beef, chicken, peach, pork, and tomato. Across the Caribbean and Central and South America, food allergen label regulations vary by country from mandatory (e.g., Brazil, Argentina, Chile) to voluntary (e.g., Cuba, Honduras, Peru). Furthermore, the widespread variation in precautionary allergen labeling – “information on the possible and unintentional presence in food of substances or products causing allergies or intolerances, provided voluntarily by the food business operator” – poses significant challenges to the traveler given current uneven legal standards and regulation. (Figure 3)^{25,26}

Notification of allergy—While not specific to travel, in a study of allergic reactions in restaurants, only 45% of those who reacted had given prior notification to the restaurant about their allergy.¹² As a result, early notification of an allergy to any food establishment frequented on travel is essential. If possible, it would be recommended to pre-print information in the language of the region about the specific allergen.²¹ Checking the menu online ahead of time may also be helpful.²¹

Those managing FA and their families must remain vigilant even if the restaurant has been notified ahead of time. Qualitative studies in general have found that employees of food establishments feel comfortable in providing safe meals to customers with FA although in multiple studies, it was identified that many believe that consuming a small amount of allergen is safe.^{27–29} In a survey of restaurant personnel in Turkey, over 50% responded that they felt customers with FA could consume a small amount of allergen without reacting.²⁹ Other misconceptions identified in other studies among restaurant personnel include a belief that fryer heat destroys allergens, and that removing an allergen after a meal is cooked (for example picking nuts off a dish) is safe.³⁰ In addition, a study of reactions in restaurants found that in 50% of incidents the allergen was “hidden” (such as in sauces or dressings) which prevented visual identification.¹² Strategies to remain safe when eating abroad include always asking about ingredients in the meal (and preparation), speaking directly with the person involved in food preparation, and avoidance of some established higher risk places for cross-contact such as buffets, bakeries and restaurants known for serving the allergen in question (such as avoidance of seafood restaurants if fish allergic).²¹ If there are multiple food allergies, staying in a place where food can be prepared by the family instead of requiring eating in a restaurant may be a preferable option.¹³

Management of reactions—In a survey by the Environmental Health Specialists Network of 278 restaurants, while most food service employees (including managers, food workers and servers) were knowledgeable about FA, many expressed lower confidence in the ability to manage an allergic reaction should one occur.²⁸ As a result, a printed anaphylaxis action plan in the local language can be helpful.¹³ In addition, persons with FA should have on their person at all times at least two epinephrine autoinjectors, medical

insurance information, information regarding how to activate emergency medical services, and information regarding the location of tertiary care centers if required.¹³

Language and cultural barriers—Perhaps among the biggest inherent challenges faced by international travelers are language interpretation and cross-cultural communication barriers. While language and cultural barriers pertain to all aspects of the travel experience, navigating food safety in potentially unfamiliar local contexts imparts a heightened degree of uncertainty on the part of the traveler, and thus may understandably be a source of distress and intensified hypervigilance. Adapting the travel diet to assure certainty (e.g., eating ‘plain’ foods) may reduce the spontaneity that often provides one source of joy in traveling. However, in the worst-case scenario, failure in recognition and/or miscommunication regarding food ingredients may result in accidental ingestions of culprit foods and subsequent allergic reactions.

The uneven global distribution of FA may also pose additional challenges to the traveler.³¹ Explicably, varying societal experiences with FA likely account for differences in sociocultural awareness of FA itself, appreciation of FA as a potentially dangerous condition, and practice patterns in identifying and managing allergic reactions. As foods and cuisines are as numerous, varied, and diverse as the regional cultures from which they emerge, the dominant food allergens of the destination region may differ from those of the traveler’s origin. Thus, in addition to navigating language barriers, there may be additional burden in seeking cross-cultural understanding of one’s FA in order to facilitate safe exchange and preparation of food. It should also be noted that even among industrialized countries, there may be regional differences in characterizing the severity of allergic reactions and clinical thresholds for using epinephrine for treatment.³²

Despite these inherent risks, travelers may wish to employ a range of strategies in order to mitigate their FA risk while abroad. In a previous qualitative study by Barnett et al., semi-structured interviews were performed in a sample of 32 UK individuals with peanut and tree nut allergies to identify strategies used to manage their FA while traveling abroad. While the overarching theme was that traveling abroad with a peanut or tree nut allergy is inherently difficult, other major themes that emerged with regard to strategies included choice of destination, familiarity with destination, air travel issues, health care accessibility, and avoidance of high-risk foods. Regarding language barriers, some individuals only considered traveling to countries where the dominant spoken language is similar to that of their home country (e.g., English) or where there was perceived language proficiency of the destination language. Yet, unfamiliarity or language barriers did not preclude other individuals with peanut and/or tree nut allergies from traveling to a foreign country. For some of these individuals, a practical strategy employed use of “translation cards” that had written statements about their FA status. For example, a statement, translated to the appropriate language, might include “I have a nut allergy. Can you cater to me?” Some also wrote cards for emergency situations, such as “My child is having anaphylactic shock. Could you ring the ambulance?” Knowing the specific words for the culprit allergen in the destination language (e.g., *cacahuète*, French word for peanut) was also deemed important and is practical. Carrying a comprehensive, encompassing list of foods that contain the culprit ingredient (e.g., *gianduja* for chocolate with hazelnut paste, *pignoli* for pine nut

[Italian language]) may be particularly relevant, depending on the travel region. Images of culprit foods, in addition to translated words, is another practical consideration to facilitate communication, rooted in both common sense and in health communication best practices (Table 1)^{33 34} FA advocacy organizations can be a practical resource for the traveler, including for translation cards (also known as “chef cards”) and lists of foods containing common culprit food allergens (Table 2).

Food accessibility—In achieving safe access to foods during meals prepared by others, the same principles and strategies apply to the traveler as they do to the non-traveler. Eating prepackaged food known to be free of culprit food allergens and that has previously been tolerated in the past may provide the most certainty regarding food safety. Even with this strategy, there will inevitably be an index experience with consuming a certain pre-packaged food for the first time and care needs to be taken to identify potential food allergens among the ingredients on the food label. Navigating written language interpretation will be necessary if traveling abroad. Communicating with local shop keepers and grocery workers might provide additional reassurance. Seeking lodging accommodations that allow one to prepare their own meals (e.g., kitchen appliances such as microwave and refrigerator, storage areas for personal groceries) may also be helpful in this regard. For those venturing to restaurants and other eating establishments, communication is key, both ahead of the visit and during the visit. Proactive disclosure of one’s food needs, including informing restaurant staff or catering staff of one’s own culprit allergens and potentially inquiring about the staff’s cross-contact practices, can be helpful in assessing personal safety and obtaining the level of reassurance needed. In the best-case scenario, this may happen ahead of time by reviewing menus and speaking directly with restaurant staff and/or event planners. Using a “chef card” (in the proper translation if needed) can provide consistent written communication in disclosing one’s FA needs and the need to avoid cross-contact of foods during meal preparation. Though not specifically empirically evaluated for communicating FA information with restaurant workers, the principle of closed-loop communication, or “teach back”, may be an additional helpful, practical strategy.

Most importantly, regardless of the traveler’s risk tolerance and choices regarding eating on holiday, they should be educated and trained to be able to recognize allergic reactions and execute their FA emergency plan with epinephrine auto-injectors and antihistamines, per usual care.

Patients currently undergoing food allergy treatment—FA treatment options including oral immunotherapy (OIT) and sublingual immunotherapy are being offered increasingly in clinical practice.³⁵ Patients managing FA who are undergoing treatment will require additional preparation to ensure a safe travel experience. Recent literature demonstrates that Peanut OIT in adults is associated with significant improvements in food neophobia which may be beneficial in the setting of travel.³⁶ In a survey study, caregivers of peanut allergic children reported a strong desire for OIT as a buffer against an unintentional reaction, although most admitted that this would not significantly change their anxiety or the family’s lifestyle.³⁷ While there is a paucity of published literature on this topic, we will

endeavor to elaborate on what we believe to be best practices related to patients undergoing food desensitization treatment with plans for travel.

Patients should be encouraged to meet with their treating allergist to discuss important considerations well in advance of their travel dates. Depending on where the patient is in the treatment course and duration of travel, it may be reasonable to consider decreasing the daily dose or even holding doses entirely to mitigate risks of reactions away from home if that risk is felt to outweigh prolongation of treatment and potential loss of tolerance while doses are held. If airline travel is planned, patients utilizing dilutions or liquid products for dosing will need to contact their airline to determine what documentation may be needed to allow them to fly with these liquids. Patients should be advised to not dose on days where airline travel is planned to avoid a reaction while in flight. Care must also be taken to plan for dosing to account for time changes.

An itinerary for travel should be reviewed to ensure that the planned dosing time can be followed by the recommended rest and observation period. Patient-families will need to research transport options to ensure appropriate food temperature during travel as well as food storage options at their planned accommodations if refrigeration of products is required.

Discussion

Managing FA with travel presents multiple unique challenges to ensure a safe and enjoyable experience. Survey studies demonstrate that FA affects vacation planning, with concern about reactions and proximity to medical care reported as being the most common considerations on selection of vacation location. Nearly all respondents said they would not vacation in a remote location. While many best practices for management of FA during travel are employed for daily FA management, a recent literature review identified the need for research to inform best practice related to children with FA and travel.³⁸

Patient-families managing FA should be reassured that, in the absence of food ingestion, an allergic reaction is unlikely, but in higher risk situations such as airline travel prepackaged meals brought by the patient-family present the safest option. All patients with FA should have up to date epinephrine autoinjectors and a FA action plan, but this is imperative prior to travel, particularly if access to rapid medical attention cannot be guaranteed. Resources including chef cards and FA action plans in a variety of languages are available for use to mitigate the challenge of language barriers in communicating dietary restrictions.

Travel preparations may seem daunting to patients-families. There are myriad patient-family focused resources dedicated to preparation for travel while managing FA (Table 1). While this is not an exhaustive or endorsed list, the allergist may choose to share these or other resources that may assist families. Discussion of evidence based situational awareness is imperative as there is much misinformation surrounding FA and travel risk promulgated on select patient-focused interfaces. Productive conversations surrounding FA and management might be facilitated by shared-decision making principles, as any of the number of decisions

a traveler may need to make are deeply personal and depend on their own values and risk tolerance.³⁹

Conclusion

Eating is both a necessary and social function and is an inherent part of the travel experience. Patients with FA must utilize careful planning and preparation to ensure access to safe food and emergency medications at all times. Additional priorities include considering the risk of reactions for each situation, method of travel, proximity to emergency medical services, and other general preparations for travel domestically and abroad. The allergist can serve as an important resource in assisting patient-families with these preparation measures to help patients achieve a safe and enjoyable travel experience. As many of these individual decisions are personal, shared-decision making principles may provide a framework that can help guide counseling discussions that strive to balance risk mitigation strategies with travel activities.

Abbreviations/Acronyms:

FA	Food Allergy
FALCPA	The Food Allergen Labeling and Consumer Protection Act
FASTER	The Food Allergy Safety, Treatment, Education, and Research Act

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Key Messages

- Travelling presents unique challenges for patients and families managing food allergy.
- Adequate preparation is imperative to ensure access to safe food and emergency medications at all times.
- Careful planning prior to travel is necessary for patients undergoing food allergy treatment.
- Proximity to healthcare resources is reported to be the most important consideration for vacation location by patients with food allergy.

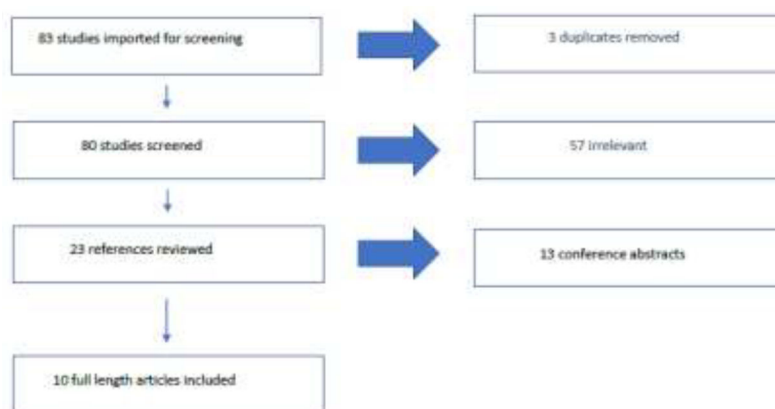


Figure 1.
PRISMA Diagram



Figure 2.
Considerations for managing food allergies during travel.



Figure 3. Selected examples of allergens subject to mandatory allergen labelling worldwide.

In shades of blue are shown countries where the eight major allergens (“The Big 8”) must be declared if present. Country-specific allergens additionally subject to mandatory labeling are depicted with dedicated icons

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Table 1.**Practical Strategies to Consider Navigating Language and Cross-Communication Barriers**

1. Learn words (written and spoken) of all culprit food allergens in the spoken language of your destination.
2. Carry a comprehensive list of ingredients and foods that contain your culprit food allergens
3. Use “translation cards” or “chef cards” that state your food allergy in plain language. E.g., I have an allergy to peanut. Peanut makes me sick. Eating food that has touched peanut is dangerous for me.
4. Carry pictures of your culprit food allergens.
5. Carry translated copies of food allergy emergency plans
6. Learn words (written and spoken) of epin phr'n., and antihistamines.

Consider requesting closed-loop communication (“teach-back”) when providing instructions regarding your food allergy.

Table 2

Select Patient-Focused Resources for Travel Preparation

Name	Description	Access
Equal Eats	Webpage with chef cards available in 50 languages for a variety of foods	www.equaleats.com
FARE travel page	Webpage dedicated to travel preparation "Road Trip" travel checklist available for download	www.foodallergy.org/resources/traveling
Allergy Travels	Facebook group of patients-families managing FA dedicated to dis-seminating best practices	https://www.facebook.com/groups/allergytravels
Kids With Food Allergies flying with food allergies page	Webpage dedicated to airline travel preparations Links to high-yield resources including the nut policies of major US airlines	https://www.kidswithfoodallergies.org/flying-with-food-allergies.aspx
University of Nebraska Food Allergy Research and Resource Program	Webpage with interactive food specific international regulations	https://farrp.unl.edu/IRChart

Abbreviation: FA, food allergy.