

Preparing for Oral Food Challenges

Jennifer LeBovidge, PhD
 Psychologist, Division of Immunology
 Boston Children's Hospital
 Assistant Professor, Harvard Medical School






Disclosure statement

I have no financial interests to disclose.



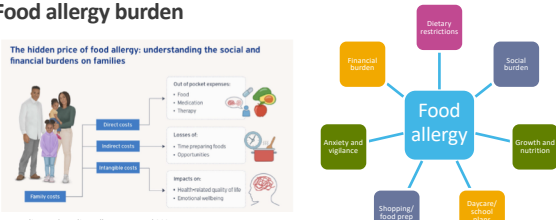
Objectives

1. Review potential benefits of oral food challenges (OFCs)
2. Discuss common barriers to completion of OFCs and of keeping the food in the diet after negative challenges
3. Identify strategies to prepare patients and caregivers for OFCs, reduce anxiety and increase confidence
4. Identify strategies to support patients and caregivers after completion of OFCs


Food allergy burden

The hidden price of food allergy: understanding the social and financial burdens on families



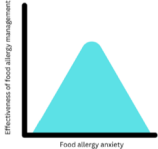
Protudjic et al., Pediatr Allergy Immunol 2025

Golding et al., Ann Allergy Asthma Immunol 2021; Golding et al., Pediatr Allergy Immunol 2022; Venter et al., J Allergy Clin Immunol Pract, 2024




Why is food allergy anxiety so common?

- Possibility of life-threatening reaction
- Effective allergen avoidance requires constant vigilance
- Management is largely preventative – anxiety about what “could happen”
- Food is part of daily life, variability in others’ knowledge (school, dining out, social events)
- Misinformation about exposures causing anaphylaxis
- Anxiety about ability to treat a reaction/fear of epi




Palloni J & Muraro A, Clin Exp Allergy, 2020; Dahlsgaard K et al, J Allergy Clin Immunol, 2020; Golding M et al, Ann Allergy Asthma Immunol, 2021; Golding M et al, Pediatr Allergy Immunol, 2022



Social burden of food allergy

- Food is a part of many social events, requires planning
- **Young children:** require careful supervision, can limit family activities and leaving child with other caregivers
- **School-aged children:** increased awareness of differences from peers, want to fit in, potential for isolation
- **Adolescents:** focused on peer relationships, want peers to understand seriousness of food allergies, but don't want allergies to be a “big deal” or “burden,” challenge of navigating intimate contact
- Children and teens are at increased risk (~ 35%) for **bullying**, occurs mostly in school setting and is associated with worse psychosocial functioning

Rouf et al, Clin Child Psychol Psychiatry, 2012; Engel et al, Pediatr Allergy Immunol, 2025; Ho et al, J Pediatr Psychol, 2024; Golding et al, Pediatr Allergy Immunol, 2022; O'Sullivan, Pediatr Allergy Immunol, 2025; Scheffel et al, Pediatr Allergy Immunol, 2025



Feeding difficulties/stress in food allergy

- Fewer food options, diet "monotony"
- Risk of nutritional deficiency/poor growth
- Caregiver anxiety with food introduction
- Food refusal/restrictive eating
- Fear of reactions
- Aversive experiences with eating
- Differentiation of reaction vs anxiety symptoms

Hill et al., *Pediatr Allergy Immunol* 2024

Proctor et al., *Int J Eat Disord* 2016; Park J et al., *J Allergy Clin Immunol Pract*, 2025; Venter et al., *J Allergy Clin Immunol Pract* 2024

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Potential benefits of oral food challenges

OFCs have the potential to reduce food allergy burden through:

- Reduced anxiety about reactions
- Increased dietary options
- Improved growth and nutrition
- Improved health-related quality of life (less daily management burden, fewer social restrictions, increased child independence, spontaneity)
- Reduced food and healthcare costs
- Greater certainty about diagnosis
- Better understanding of threshold for reaction

Kansen et al., *Pediatr Allergy Immunol* 2018; Alsogoff et al., *Glob Pediatr Health* 2019; Hsu et al., *J Allergy Clin Immunol Pract* 2020; Eriksson, *J Pediatr Nurs* 2023; Strimholm et al., *Acta Paediatr* 2017

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Importance of language

- Negative OFC (patient tolerates the food)
- Positive OFC (patient reacts to the food)

Bird et al., *J Allergy Clin Immunol Pract* 2020

"The language is negative. It's a fail. It makes you feel horrendous if you fail. This poor child has to come in and eat a food that we've told is going to kill them, and they do it and are told they've failed."

Hsu et al., *J Allergy Clin Immunol Pract* 2020

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Positive impact of OFCs on quality of life

- Systematic review
 - Improvement in food allergy-specific HRQoL (for children, adolescent & adult patients) and parent burden after an OFC *irrespective of outcome*
 - HRQoL/burden do not improve among patients that did not undergo an OFC
 - HRQoL does not improve following OFCs with uncertain outcomes

Kansen et al., *Pediatr Allergy Immunol* 2018

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Caregiver and patient perspectives on benefits of positive OFC

- Decreased uncertainty
- More information about child's allergy/threshold
- Experience of recognizing symptoms/seeing reaction treated under medical supervision/in safe setting

Theodorakakis et al., *J Allergy Clin Immunol Pract* 2024; Zijlstra et al., *Pediatr Allergy Immunol* 2010; Nguyen et al., *Pediatr Allergy Immunol* 2010; Strimholm et al., *Acta Paediatr* 2017; Knibb et al., *Clin Exp Allergy* 2012

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Patient-Caregiver epinephrine administration during OFC

Parental experience administering epinephrine for systemic reactions during infant and toddler oral food challenges

Theodorakakis et al., *J Allergy Clin Immunol Pract* 2024

Extended analysis of parent and child confidence in recognizing anaphylaxis and using the epinephrine autoinjector during oral food challenges

Solier et al., *J Allergy Clin Immunol Pract* 2019

Mixed method study of parental experience administering epinephrine for systemic reactions during infant and toddler oral food challenges

- Experience positive and helpful, despite reported anxiety
- Parents gained confidence for future EAI administration/recognizing symptoms requiring treatment with EAI
- Positive to see epi work quickly/efficiently

Survey study of parents and children undergoing OFCs invited to administer EAI under supervision of medical team if anaphylaxis occurred

- EAI administration improved perceived: ability to recognize severe reaction, confidence in EAI administration, knowledge of EAI technique; skill in EAI use

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Potential barriers to participating in OFCs

- Fear of ingesting food that has been previously avoided/considered dangerous
- Uncertainty/the unknown: "Waiting for unknown food reactions"
- Caregiver/child concerns about serious reactions
- Worry about recognizing reactions in infants/young children who cannot verbalize symptoms
- Fear of needing to use EAI
- Do not think the child will eat the food (picky eater, texture/taste aversion, feeding disorder, lack of interest, developmental stage)
- Do not think the food is important to the child's diet
- Worry about differentiating subjective allergic symptoms from physiological symptoms of anxiety (shortness of breath, dizziness, chest pain, nausea/abdominal pain)
- Fear that reaction could have negative psychosocial impact

Hsu et al., J Allergy Clin Immunol Pract 2020; Davis et al., J Allergy Clin Immunol Pract 2015; Strinnholm et al., Acta Paediatr 2017

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Facilitators of participation in OFCs

Increased anxiety on the day of the challenge is normal and common

What helps?

- Trust in the child's HCP
- Knowing reactions can be handled in the medical setting – "facing fears in a cautious environment"
- Education about the challenge procedure, knowing what to expect

What do families say they want/need?

- Time for consultation, questions
- Detailed written information about what to expect, risks/benefits
- Greater awareness and support for the emotional burden

Herbert et al. J Health Psychol 2013; Strinnholm et al., Acta Paediatr 2017; Theodorakakis et al., J Allergy Clin Immunol Pract 2024; Hsu et al., J Allergy Clin Immunol Pract 2020; Davis et al., J Allergy Clin Immunol Pract 2015

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Framing anxiety about food allergies and OFCs

Some anxiety is normal and adaptive – helps patients/families to maintain vigilance and readiness to respond to allergic reactions, motivates planning for new situations

When does anxiety become unhelpful?

- Overestimate risk
- Underestimate ability to cope

→ **Avoidance** (foods and situations beyond what is medically necessary, medical tests/interventions)

] **Modifiable!**

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How do we help patients and families to feel prepared and confident for an oral food challenge?

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Patient-centered approach to shared decision making

- Families approach OFCs with varied goals, preferences, and concerns
- Consider with patient/family:
 - Goals (diet, nutrition, anxiety, daily management, social impact)
 - Nutritional value of foods being considered
 - Potential impact on quality of life
 - Fears (reaction, epi, disappointment)
 - Feeding concerns, developmental stage, readiness for solids
 - Cost and availability of food
 - What foods are important introduce (lifestyle, culture)
- Opportunity for tailored guidance and support

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Validate and normalize anxiety

- **Normal and expected** that you may feel anxious about eating (or your child eating) a food that you have carefully avoided!
- Can help to frame the OFC as something different - we are careful to avoid the food at home, the OFC is a planned, safe way to eat the food at the allergist's office
- Many children/caregivers feel anxious and still participate in OFCs!


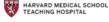
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Provide education - what do families need to know ?

- **How will this help?**
 - What will we learn from the OFC?
 - How will it affect my child's health and quality of life?
- **Why now** – why does the allergist think my child is a good candidate?
- **What happens** during the OFC- what should I expect?
- **How will my child be kept safe**- what happens if there is a reaction?



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Supporting caregivers

- Normalize that some anxiety is common and normal, particularly in the context of previous allergic reaction, uncertainty about the unknown
- Mindset matters
 - Valuable clinical tool that can improve quality of life and nutrition
 - Having the OFC because child may not be allergic to the food
 - OFC is a safe, planned ingestion under medical supervision – not an accidental exposure! (keep trauma history in mind)
 - Benefits *even if the child reacts* (increased confidence in recognizing/treating reaction, increased certainty about diagnosis, threshold information)
- Discuss the plan for managing allergic reaction and parents' role in treatment
- Encourage questions

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Preparing children



- Providing age-appropriate information about the OFC can help children feel confident
- Use language child can understand, enough information to feel prepared without overwhelming them
- Don't use words like "pass" or "fail"
- Focus on achievable goals:
 - Eating the food
 - Find out if they are allergic to the food
 - Want kids to feel proud regardless of the outcome!
- Give children enough advanced notice to feel prepared/ask questions, without prolonging anxiety
- Older children/teens should be involved in discussion with allergist in age-appropriate way

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Education - how will this help?



Purpose:

- "We are going to learn if eggs are safe for you to eat."
- "Your testing shows us you may not be allergic to eggs anymore. The OFC will tell us if you have outgrown your food allergy and can eat eggs."

Benefit:

- "If you can eat the cow's milk yogurt at the doctor's office, you will have more foods you can eat at home/more foods to help your body grow"
- For older children/teens: may discuss social benefits/independence



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Education- what to expect?

- "We are going to your doctor's office, and your job will be to eat the peanut butter. You can eat it on a spoon, or we can spread it on your favorite crackers. You will eat a little bit, then you'll have time to play and do fun activities, like color, read books and watch videos. You can help choose the toys that we bring!"
- "We will have the OFC at your allergist's office. You will drink a small amount of soy milk and then we'll wait about 15 minutes. We'll bring activities like games and videos to keep busy. If you are feeling well, you'll do this a couple more times. If you don't have a reaction, this means you're not allergic to soy."



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Education - why is it safe?

- "The nurses and doctors will watch you to make sure you are healthy and safe. I will be with you the whole time."
- "If you have a reaction, the doctors will give you medicine so you can feel better quickly."
- For older children, discuss possible treatment with epinephrine ahead of time, including the device that will be used to administer epinephrine (EAI or nasal spray).
- Talk with the teen about their role in treating an allergic reaction (participate, observe) , if this is an option

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Helping children eat the challenge food

- Talk ahead of time about accepted textures, food preferences, feeding concerns
- Discuss options for different age-appropriate textures/forms of the challenge food
- Discuss preferred (allergen-free) “buddy foods” – mixing vehicles, condiments, crackers
- Bring more than one form of the allergen and/or mixing vehicles
- Bring feeding items from home - favorite placement, bowl, cup, utensils
- Reassure families that no one will/should force the child to eat the food. The medical team will decide what to do if your child is unable to finish the challenge food.
- Practice at home with allergen-free foods that are similar to the challenge food



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Creating a coping plan

- A coping plan is a personalized, developmentally tailored plan for managing any stress or anxiety that may occur during the OFC
- Important to involve the child in developing their plan to increase control!
- Can include:
 - Food to be challenged/how will eat it
 - Reasons for doing the OFC/what is most important for the patient
 - Coping thoughts (focus on goals/motivation, safety, bravery)
 - Fun activities to keep busy
 - Calming strategies (deep breathing, distraction, comfort item, hugs)
 - Special reward to look forward to after the OFC – regardless of outcome

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Coping plan	Tips for caregivers
<p>Food I will be eating: Milk (I will try yogurt)</p> <p>Reasons for doing the challenge: More safe foods at parties, I want to try pizza and ice cream</p> <p>Coping thoughts: I’m in a safe place, I might be able to have dairy, I can do brave things!</p> <p>Fun activities: Sketch book, videos, Uno</p> <p>Coping actions: Listen to favorite music on mom’s phone, do my relaxed breaths</p> <p>After my challenge: Family game night!</p>	<ul style="list-style-type: none"> • Use positive reinforcement to encourage eating, such as a small prize or sticker after each dose • Bring along physical copy of the coping plan to remind your child of their strategies • Remember to praise your child’s bravery and use of coping strategies. • Share your child’s coping plan with their allergy care team on the day of the OFC, so that they can support you and your child.

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Involving children/practicing at home before the challenge

- Helping choose the form of the food/ “buddy food” (acceptable choices)
- Eating foods with similar textures/flavors
- Packing bag of fun activities
- Making a fun or calming playlist
- Practicing relaxation skills
- Medical play with dolls, stuffed animals
- Older children may benefit from practice with epi trainer device

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What to bring?

- Food(s)/Buddy foods
- Unexpired epinephrine
- Change of clothes (in case needed)

Infants	Young children	School-aged children	Teens
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Favorite serving bowl/ plate, spoon, bottle/cup <input checked="" type="checkbox"/> Comfort items (blanket, pacifier, teething ring, stuffed animal) <input checked="" type="checkbox"/> Activities (small toys, rattles, board books) 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Favorite serving bowl/ plate, spoon, cup <input checked="" type="checkbox"/> Comfort Items <input checked="" type="checkbox"/> Activities (small toys, puzzles, games, activity books, tablet with games or videos) <input checked="" type="checkbox"/> Small prizes for after each dose (optional) 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Comfort Items <input checked="" type="checkbox"/> Activities (puzzles, games, drawing materials, tablet with games or videos) <input checked="" type="checkbox"/> Small prizes for after each dose (optional) 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Activities and coping tools (such as books, games, phone/tablet)

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Tips for caregivers - Modeling confidence for children

- Children will pick up on adult’s cues – calm is catching!
- Support: validate anxiety + express confidence
- On the day of the OFC, preview the plan for the OFC procedure with the allergy care team and make sure that any questions you have are answered.
- Let the team know if you have any concerns and how you can best support your child through the process.
- Keep adult conversations between adults

I know you feel a little nervous, and I know you can do this.


We are prepared and it is safe

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Motivational Interviewing tools

Open-ended questions
 People have lots of feelings about an OFC. They may feel excited, hopeful, and a little nervous.
 How are you feeling about the OFC?
 What are some of your concerns or worries?
 What are the positive things that could come out of having an OFC?
 — Use open-ended questions to elicit change talk
 — Elicit concerns/barriers first – then positives (we believe what we hear ourselves say!)

Rulers
 How confident do you feel about the OFC/your coping plan?
 — Below 5- What would you need to feel more confident, how can I help?
 — 5 or above – Wow- why a 6 and not lower? What has been helpful for you?
 — Can use a “thumbs-up meter” with children



Miller & Rollnick, 2013; Rollnick et al., 2008

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Reducing about epinephrine auto-injectors

- Auto-injector is “your friend”/ “helper medicine”
- Safe, stops reactions, make you feel better fast
- Not calling 911 because epi dangerous
- Small needle size
- Experience of other children/families (felt better right away, expected it to feel it more, felt empowered!)
- Use trainers/medical play to increase comfort
- Discuss plans for managing allergic reactions during OFCs ahead of time



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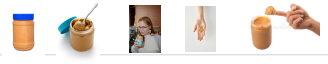
Consider proximity challenges for patients with high anxiety

The transforming power of proximity food challenges
 Chana Dinkler, MD, Jodi Shevlin, APRN, Jay M. Permay, MD
 Ann Allergy Asthma Immunol 17 (2018) 115-117

“The peanut butter didn’t attack me”
 Food allergen proximity challenges to improve quality of life
 Kaitlin B. Proctor, PhD¹, Ashley M. Ramos, PhD¹, Lisa Jones Herbert, PhD^{1,2}
 Ann Allergy Asthma Immunol 121 (2023) 9-10

A randomized controlled trial to reduce food allergy anxiety about casual exposure by holding the allergen: TOUCH study
 Thomas Wainwright, MD¹, Rachel Annunziato, PhD¹, Eric Riklin, MS¹, Eyal Shamesh, MD¹, and Scott H. Sicherer, MD¹
 J Allergy Clin Immunol Pract 76 (2019); 2039-2042.e14.

“Misinformation regarding the triggers of anaphylaxis is widespread. These myths force patients and families to live in a perpetual state of alarm, causing significant disruption in their daily activities. Often, patients, especially younger children, become psychologically conditioned to a degree of avoidance that may be unnecessary given their true sensitivity.”



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Preparing for an OFC also means preparing for after the OFC!

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Barriers and Enablers of Dietary Reintroduction Following Negative Oral Food Challenge: A Scoping Review

Gibson et al., J Allergy Clin Immunol Pract 2023


Across 22 studies, rates of successful re-introduction: 55-70%

Barriers:

- Parental and child fear (perception of ongoing allergy, do not trust OFC outcome, high pre-OFC parental anxiety)
- Symptoms on re-introduction (often subjective, mild, minimal or no treatment, no medical consultation)
- Aversion and refusal
- Lower reintroduction rates for peanut and tree nuts

Enablers:

- Guidance from healthcare team after the OFC
- Awareness of importance to reintroduce food
- Some motivation to eat the food/improve nutrition



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Factors influencing reintroduction of peanut and tree nuts after negative oral food challenges in children

Cheah & Weinstein, Ann Allergy Asthma Immunol 2022

65% introduced all nuts after OFCs, 18% some, 17% none

Reasons for not introducing nuts:

- Child refusal: 51.1%
- Difficulty incorporating into diet: 25.6%

Reasons for Not Introducing Nuts	Peanut	Peanut	Walnut	Both not	Overall
Not planned to reintroduce	6.0	6.0	6.1	3.7	12.2
Not safe to reintroduce	0.0	3.4	2.4	6.0	3.3
Not confident in accuracy of OFC	0.0	0.0	1.2	1.0	3.3
Not confident in accuracy of OFC	2.6	1.7	1.2	0.0	6.7
Allergy medication at home	3.2	3.4	4.1	1.0	12.2
Child's anxiety	1.4	1.4	1.7	0.0	4.5
Child's refusal to eat	31.9	13.4	19.3	16.1	31.1
Not allergic (holding at home)	3.3	1.7	1.2	6.0	3.2
Did not reintroduce result of OFC	2.6	1.7	0.0	1.0	2.2
Not part of family diet	1.3	3.4	0.0	3.7	3.6
Allergy in other foods	1.3	1.7	2.4	1.0	2.2

Reasons for introducing Nuts:

- Able to skip dietary restrictions: 43.6%
- Improvement in nutrition: 43.1%
- Overall dietary recurrence: 29.7%
- Not introduced in family diet: 2.8%
- Child likes nuts: 2.8%
- Medical advice to introduce: 2.3%

Reasons for introducing nuts:

- Prevent allergen recurrence: 83.8%
- Reduce dietary restrictions: 54.6%
- Improve nutrition = 43.1%
- Child likes nuts = only 2.8!

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What do families want and need?

- Understand the rationale for dietary inclusion - improve nutrition, reduce the risk for the food allergy recurring.
- Understand goals for dietary inclusion- how much, how often, ad lib?
- Check-ins, communication and support for re-introduction of foods, especially for families with greatest pre-OFC anxiety and feeding challenges
- Referrals to dietitians and mental health professionals as needed

Eriksson et al., J Pediatr Nurs 2016; Palloni et al., Allergy 2017

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Normalize the shift from avoiding to eating the food

“Some children or caregivers may experience worry about eating the food they ate during the OFC at home or in other settings. This is normal and usually gets better after eating the food a few times after the OFC. It’s also normal your child may not like the taste, smell or texture of the food right away. This is common when your child is “learning about” a new food, especially if they have previously carefully avoided the food.”

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Tips for introduction at home

- Try to remain calm when offering the food- when parents seem calm and confident the child will feel more safe and confident too
- Offer the food in small quantities at first, let the child ask for more
- Don’t pressure the child to eat the food – forcing or negotiating may cause more aversion to the food
- Encourage exploration through touch, smell, licks, “mouse bites,” play
- Encourage descriptive language (salty, smooth, crunchy) vs like/dislike
- Pair food with a “buddy,” mix-in, condiment/dip
- Eat with your child for modeling, include the food in family meals
- Offer defined choices- “would you like your peanut butter on apple or toast?”
- Involve child in cooking/prep in age-appropriate ways

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One allergen: multiple serving ideas

Peanut	<ul style="list-style-type: none"> • Peanut butter, ground peanuts, peanut flour, peanut puffed snack • Mix in: meatballs, hot cereal, breading for poultry, trail mix, muffins, pancakes, chocolate, cookies, energy bites
Milk	<ul style="list-style-type: none"> • Liquid milk (plain or flavored), yogurt, cheese (pizza, grilled cheese, cheese dip), non-fat dry milk powder, infant formula • Mix in: hot cereal, smoothies, purees, custard
Baked milk / egg	<ul style="list-style-type: none"> • Liquid milk, yogurt, non-fat dry milk powder used in baking • Muffins (pumpkin, banana, chocolate zucchini, corn), cupcakes, breads, crackers, baked pancakes • Recipes see: AAAAI Muffins and More: A baked milk and baked egg recipe and guidebook

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Post- Successful Baked Egg and Baked Milk Challenge Resource

A Baked Milk and Baked Egg Recipe and Guidebook:

https://education.aaaai.org/sites/default/files/media/2025-01/Muffins%20and%20More_Updated_20250701.pdf





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Coping after an allergic reaction

- It is normal to feel disappointed or experience a short term-increase in worry or vigilance if a child has a reaction during their OFC.
- Help children label their feelings
- Let children know you are proud of them for participating in the OFC
- Return to usual management routines – safety and security
- Focus on positive learning experiences from the OFC
 - You did a good job telling us how you were feeling
 - We learned that the medicine helped you feel better quickly
 - We are doing the right thing in taking steps to manage their food allergy
 - Possibly learning more about the amount of the food that causes an allergic reaction
- Provide clarity about what is safe. “You had an allergic reaction to egg. Your food at home and school is safe for you. It doesn’t have egg in it.”
- Ask the child if they have any questions or worries after the OFC



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Signs that more support may be needed

- Worry or behavior changes lasting more than a week or two
 - Refusing typically accepted foods
 - Increased clinginess, fussiness, irritability, anxiety
 - Needing frequent reassurance that food is safe
 - Avoiding situations involving food
 - Sleep problems
- It may be helpful to meet with a mental health professional who has experience helping families cope with food allergies or stressful medical experiences.

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Team members who can help

Mental health professionals

- Help caregivers and children prepare for OFCs, create coping plans
- Build anxiety management techniques
- Build skills for symptom differentiation (anxiety vs allergic condition)
- Help with picky eating/feeding concerns for completing the challenge/keeping food in the diet
- Support coping with allergic reactions

Dietitians

- Evaluate nutrition status/needs
- Provide developmentally appropriate and palatable food options for challenge and home introduction
- Provide resources - recipes, products

Child Life specialists

- Provide coping support on the day of the challenge

Other professionals to help with feeding concerns: gastroenterologist, feeding therapist

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Key Takeaways

1. Anxiety about oral food challenges is common for patients with food allergies and their caregivers
2. There are steps that allergists and other allergy care providers can take to help families feel more confident during oral food challenges
3. It is important to check in after oral food challenges to help patients and caregivers keep foods in the diet
4. Referrals to other professionals can be helpful to manage anxiety and feeding concerns



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Thank You!

Jennifer.LeBovidge@childrens.harvard.edu



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