



RESIDENT ARTICLE

# Evaluating Knowledge and Implementation of Early Peanut Introduction Guidelines: A Cross-sectional Survey

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## BACKGROUND

Peanut allergy is a growing public health concern. Not only is peanut the leading food-related cause of fatal anaphylaxis, but the prevalence of peanut allergy appears to have tripled in the past ten years.<sup>1,2,3</sup> Various studies have shown a significant impact on patients' and families' quality of life due to fear of life-threatening allergic reactions.<sup>4,5</sup> In an effort to reduce peanut allergy and decrease the burden on the healthcare system, clinical trials by allergists over the past two decades have revealed novel evidence, leading to drastic changes in the approach to peanut allergy prevention. In 2000, the American Academy of Pediatrics (AAP) guidelines recommended the delay of peanut introduction until three years of age.<sup>6</sup> By 2010, these guidelines were rescinded, and both the AAP and the National Institute of Allergy and Infectious Disease (NIAID) suggested that there was insufficient evidence to support either early or delayed introduction.<sup>7,8</sup> The landmark Learning Early About Peanut Allergy (LEAP) trial published in 2015 showed an 86.1% relative reduction in the prevalence of peanut allergy in a high-risk (severe eczema and/or egg allergy), early consumption group, providing strong evidence suggesting that early and regular consumption of peanut could reduce peanut allergy.<sup>9</sup> This robust finding prompted NIAID guidelines to officially shift in 2017 from late to early introduction of peanut.<sup>10</sup> As of 2019, the AAP recommends the introduction of peanut as early as 4 to 6 months of age in infants with severe eczema and/or egg allergy.<sup>11</sup>

Due to the profound changes that these guidelines have undergone over the past decade, implementation of infant screening and early peanut introduction remains inconsistent among pediatricians.<sup>11,12</sup> Basic understanding and clinical application of updated guidelines is paramount for pediatricians, who play a key role in preventive medicine, including identifying at-risk infants and preventing them from developing peanut allergy.

## OBJECTIVE

This pediatric resident quality improvement project aimed to assess knowledge, implementation, and barriers to implementation of early peanut introduction guidelines among physicians in the outpatient pediatric clinic setting.

## METHODS

Assessment of baseline knowledge and practice habits among University of South Florida (USF) pediatric attending physicians (AP), community pediatricians (CP), and USF pediatric resident physicians (RP) was conducted using an anonymous survey in January 2020. The survey had 6 questions (Qs) which consisted of demographic information, implementation, assessment of knowledge, and barriers to implementation (Table 1).

CATEGORY	QUESTION
1.	Post-graduate year of training/practice
2.	Frequency of self-reported use of anticipatory guidance for early peanut introduction at the six-month well-child checks
3.	Risk factor for peanut allergy: Severe eczema and egg allergy;
4.	Peanut IgE level of >0.35 kU/L as an indication for allergist referral
5.	Recommended dosing/frequency of peanut protein introduction of approximately two grams, three times weekly
6.	Lack of time, parent refusal, lack of parental understanding, forgetting to discuss, and/or lack of awareness of guidelines

*Table 1: Anonymous survey design*

The RP group received knowledge enhancement interventions following the initial survey, which included a lecture given on the NIAID Addendum Guidelines for early peanut introduction, electronic medical record (EMR) template phrases for the 6-month well child check (WCC) created by and shared with the residents, and reminders posted in resident clinic workrooms. Eight weeks following the interventions, residents completed a post-intervention survey.

We conducted descriptive analyses of relevant variables including median, range (for continuous variables) and frequencies (for categorical variables). We created a composite knowledge score (maximum value of three and a minimum of zero points) by including responses from the three specific knowledge questions (Figure 1, Q 3-5). The distribution of knowledge score was investigated across participant characteristics (e.g., level of training, the use of anticipatory guidance, etc.) with Kruskal-Wallis test at the 0.05 level of significance. All statistical analyses were conducted using SPSS version 26.0 software.

## RESULTS

Pre-intervention surveys were completed by 12 AP, 8 CP, and 27 RP. Percentages of correct answers in three survey categories were: risk factors for peanut allergy (42% vs. 13% vs. 48%); peanut IgE level as an indication for allergist referral (83% vs. 25% vs. 48%); and recommended dosing/frequency of peanut protein per week (25% vs. 25% vs. 11%), in the AP, CP, and RP groups, respectively. The pre-intervention median composite knowledge score was 1 (range 0-3). Knowledge was similar across the AP, CP and RP groups regardless of the physician's duration of experience since graduating medical school ( $p = 0.08$ ). The implementation of anticipatory guidance regarding early peanut introduction at the six-month WCC was 33%, 13%, and 11% in the AP, CP, and RP groups, respectively. There was no difference observed in knowledge of subjects who used anticipatory guidance versus who did not ( $p = 0.26$ ).

Following knowledge enhancement interventions, RP showed improved knowledge in all three areas assessed: risk factors for peanut allergy (percentage of correct answers increased from 48% to 64%); peanut IgE cutoff level for allergist referral (48% to 50%); and suggested dosing/frequency of peanut protein introduction (11% to 64%) in the pre- and post-intervention surveys, respectively. The post-intervention median composite knowledge score was 2 (range 0-3). Resident self-reported implementation of anticipatory guidance regarding early peanut introduction at the 6-month WCC also improved from 11% to 36%.

Collectively among all three groups, the most commonly reported barriers to implementation were forgetting (62%), not having enough time in the WCC (56%), and being used to the old guidelines of late peanut introduction (21%).

## DISCUSSION

Our study findings suggest that insufficient knowledge of published guidelines for early peanut introduction exists across both resident and attending physicians in academic and community settings, reiterating findings of prior research.<sup>12</sup> Knowledge enhancement interventions including resident education and various reminder methods led to improved proficiency in identifying risk factors for peanut allergy, indication for specialist referral, and the weekly recommended dose of peanut protein, as well as self-reported implementation of the guidelines.

As medical practice guidelines are continually evolving, physicians are often left with gaps in their knowledge. Pediatricians are actively involved in patients' lives from an early age, and thus play a pivotal role in promoting preventive healthcare. Despite strong evidence that early introduction of peanut leads to the prevention of peanut allergy in high-risk infants, many pediatricians and resident physicians reported under-implementation of the most recent guidelines. Furthermore, the self-reported practice of the guidelines did not correlate with greater knowledge, as one would expect, reinforcing the need for additional interventions to spread awareness among the pediatrician community.

The limitations of this study include a small sample size; limited knowledge enhancement intervention methods; unpaired resident participants in the before and after-intervention groups; and potential demand characteristic bias during survey completion. EMR chart review could be used to directly measure the rate of documented implementation versus self-reported data in order to eliminate any selective memory bias from participants.

Future directions should aim for improving physician awareness of updated medical guidelines, such as the early peanut introduction guidelines in this study. Case-based learning has been shown to be effective in other areas of health education<sup>13</sup> and should be encouraged when new knowledge is crucial for a physician to provide services for patients. Other useful learning methods include quiz, mock WCC sessions, roundtable Q&A discussions, and mandatory learning modules by local or national organizations. Efforts should be made to expand learning styles to accommodate a diverse group of practicing physicians.

## CONCLUSIONS

Significant gaps exist in both knowledge and implementation of the early peanut introduction guidelines for prevention of peanut allergy in high-risk infants. Educational interventions are effective at improving physician knowledge and practice habits.

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