Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

survey. These physicians managed patients in the University Hospital of Brooklyn, Faculty Practice, Kings County Hospital, and Coney Island Hospital in Brooklyn, New York. Of the participants, 42% were not aware of the LEAP study and 61% did not know about the addendum guidelines. Only 41% of the participants always enquired about peanut introduction and 19% rarely or never discussed these guidelines. Furthermore, 62% of the participants started discussing peanut introduction with parents at or after the 6 months' well child visit and 7% of participants never discussed the guidelines. Moreover, 88% of the participants have never ordered peanut-specific serum immunoglobulin E for confirmation of peanut allergy and 43% of participants were not comfortable interpreting results.

Results from the parental survey are found in Table 1. A total of 182 parents completed the survey. Approximately 1/2 of parents were born outside of the United States and most of them had at least achieved a high school diploma or equivalent. Most families had less than 3 children in their household and 1/3 of the patients were less than 1 year old. Only 15% of the parents were comfortable with starting peanuts or peanut containing food between the ages of 4 and 6 months and 40% of them would start after 1 year of age. Furthermore, 94 (52%) of parents were aware that early introduction decreases development of food allergies in children and 67 of 94 (71%) heard this information from their pediatrician. Of the parents, 52 (29%) reported that their child had eczema, 17 (9%) reported that their child had a food allergy, and 90 (49%) reported a family history of atopic conditions, including asthma, seasonal allergic rhinitis, food allergy, or eczema.

It is clear from the collected data that there are knowledge gaps in the pediatric residents and attendings regarding the new guidelines for early peanut introduction. Of the participants, 42% were not aware of the LEAP study and 61% did not know about the addendum guidelines. Almost half of the parents in this underserved population were unaware that early peanut introduction decreases the development of peanut allergy. This Black population seems to have a greater prevalence of atopic dermatitis compared with the general population (estimated lifetime prevalence of up to 20%).[7] The delay in peanut introduction in this Black population found in this data, is consistent with the reported findings from Brewer et al,[8] where 89% of Black children with peanut allergy were not introduced to peanuts by age 1 year or never introduced to peanuts. Given the higher prevalence of atopic dermatitis in the Black population found in this study, it is even more imperative that the peanut early introduction guidelines be implemented.

Our study has some limitations. The patient population was mostly Black, so our data cannot be extrapolated to other populations. Given the design of the project, the data may be affected by recall bias and how well parents comprehended and answered the questions, including the diagnosis of food allergy. The investigators attempted to minimize this by writing questions at a sixth-grade level. Furthermore, some surveys were not fully completed.

Serendipitously, it seems from our data collection that pediatricians continue to be an important source of medical information for patients. Because this is an ongoing project, the next steps will include educating our physicians with posters in clinic, handouts, and presentations on these guidelines. The aim will be to increase our parents' knowledge and physician implementation of these guidelines with the hopes of preventing the future development of peanut allergy in this high-risk population.

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Peanut anaphylaxis in 2022: Decoupling epinephrine usage from emergency department evaluation

The United States surpassed 54,000,000 total cases of coronavirus disease 2019 (COVID-19) by the end of 2021.[1] During early pandemic contingency planning, recommendations were published advising the suspension of routine emergency department (ED) use after home treatment of anaphylaxis responding to a single dose of epinephrine provided symptoms promptly resolve without recurrence.[2] Shortly thereafter, a detailed anaphylaxis management algorithm tailored to at-home management during the COVID-19 pandemic was published.[3] These adaptations were devised with the goal for more selective health care utilization, so as to minimize risk of COVID-19 acquisition and to avoid overburdening health care facilities. An important underpinning for these guidelines is the perceived low risk to initial home observation after successfully treated anaphylaxis, on the basis of simulated economic modeling for peanut-

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triggered anaphylaxis.[4] Though the extent to which such adapted guidelines are currently in use by allergy providers remains unclear, each successive wave of SARS-CoV-2 has continued to heighten the importance of critical analysis of reflexive health care utilization practices for the management of anaphylaxis.

A rationale for post-reaction monitoring in the ED is the rapid detection and management of biphasic anaphylaxis. Yet, biphasic reactions are rare (0.18%-14.7% of anaphylaxis events) and possibly trigger-specific.[5] When food is implicated as a trigger for anaphylaxis, Lee et al[6] reported in 2015 a protective effect for biphasic anaphylaxis (odds ratio, 0.62 [0.4-0.94]), though this was not redemonstrated in a recent analysis (odds ratio, 0.89 [0.68-1.17]).[5] To explore this question in the context of revised definitions of anaphylaxis,[7] we obtained institutional review board approval and retrospectively reviewed data from our clinical research center from 2011 to 2017. Our cohort involved highly peanut allergic children (median 4.5 years of age) previously unexposed to investigational drug or food immunotherapy who participated in 113 double-blind, placebo-controlled food challenges (DBPCFCs) to peanut to determine eligibility for entry into clinical trials. All participants were required to have a clinical history of peanut allergic reaction and evidence of sensitization or high-titer sensitization if no history of peanut ingestion. Participants then underwent peanut DBPCFC to confirm allergy and establish the baseline threshold. Background characteristics, DBPCFC details, and exclusion criteria are found in Table 1. Each of the entry oral food challenges analyzed was positive, whereas 44 challenges (39%) resulted in a diagnosis of anaphylaxis per NIAID criteria, and just 1 challenge (0.9%) met the criteria for biphasic anaphylaxis (Table 1). Epinephrine was administered promptly for anaphylaxis treatment, with a median time of 5 (interquartile range, 0-12) minutes after applicable symptom onset. No cases of persistent or refractory anaphylaxis were identified.

Table 1
Pooled Demographic Information, Medical Comorbidities, Baseline Peanut Allergy Evaluation for Study Cohort, DBPCFC Characteristics, and Biphasic Anaphylaxis Characteristics

Demographic characteristics	
N	125
Age, median (interquartile range), y	4.5 (2.5-8)
Male	74
Female	51
White	112
African American	4
Native American	2
Asian	5
Mixed	2
Medical comorbidities	
Atopic dermatitis	89
Asthma	51
Other food allergies	61
Baseline peanut allergy evaluation	
Peanut sIgE, median kU_A/L (interquartile range)	61.6 (14-160)
Peanut SPT, median mm (interquartile range)	13 (9-19)
Entry DBPCFC characteristics for study participants	
PnOIT4 (NCT01814241)	8 doses: 1, 5, 15, 50, 75, 100, 250, 500 mg; 15-30 min increments
TLC (NCT01373242)	5 doses: 25, 50, 100, 250, 575 mg; 10-20 min increments
FARE SLIT (NCT02304991)	6 doses: 3, 10, 30, 100, 300, 557 mg; 10-20 min increments
When symptomatic, patients were observed for 2 h post-challenge in all studies	
Exclusion: history of severe anaphylaxis (hypotension/shock, neurologic impairment including cyanosis or hypoxemia [SpO_2 < 92%], confusion, collapse, loss of consciousness, or incontinence)	
Biphasic anaphylaxis DBPCFC characteristics	
Biphasic anaphylaxis (N = 1/113)	5 doses: 1, 5, 15, 50, and 100 mg at 0, 10, 20, 30, and 40 min, respectively; 43 min skin rash—diphenhydramine; 55 min gastrointestinal symptoms—epinephrine, prompt resolution; 185 min wheezing/cough—epinephrine, prompt resolution; 245 min rash; 305 min resolution of rash; 395 min patient discharged

Abbreviations: DBPCFC, double-blind, placebo-controlled food challenge; sIgE, specific immunoglobulin E; SPT, skin prick test.

Even among the most highly peanut sensitized children with large peanut skin prick test wheal size, markedly elevated levels of peanut specific immunoglobulin E, and in the majority of cases with a prior reaction history, it is most telling that biphasic anaphylaxis events were not observed at a clinically significant frequency. Our data are strengthened by the rich clinical trial setting which provides precise symptom chronology, rigorous objective and subjective symptom criteria, and post-challenge adverse event data unavailable to outpatient or ED settings. By reporting our experiences, we hope to increase the adoption of targeted recommendations designed to reduce reliance on health care utilization after anaphylaxis is successfully treated among patients for whom no risk factors for biphasic anaphylaxis (eg, severe initial presentation, >1 dose of epinephrine for initial management) or barriers to home observation (eg, unavailability of adult trained in rendering post-reaction care, additional doses of epinephrine, or access to ED or emergency medical service care) are identified.

Despite an emerging sentiment that routine ED visits are not necessary in all cases of successfully treated anaphylaxis, many resources continue to endorse this approach. Anaphylaxis management plans, for example, advise 4 hours of observation in the ED after epinephrine is used for the treatment of anaphylaxis, even if symptoms resolve. These management plans are widely circulated throughout clinics, childcare centers, and schools and may deserve a closer look in the context of revised approaches to post-reaction care.

An important consideration is that the safety-driven yet reflexive coupling between epinephrine administration and subsequent ED utilization may paradoxically reduce epinephrine use, by presenting unexpected obstacles to some patients. For example, patients susceptible to minimizing symptom severity (particularly those already subject to a variety of stressors) may justify epinephrine non-use during reactions when epinephrine use is warranted, to avoid a required trip to the ED after deployment of epinephrine. Recent publications identify this barrier to epinephrine use, citing avoidance of the ED during the COVID-19 pandemic as a factor in up to 20% of anaphylaxis cases in which epinephrine is not used.[8,9] This effect is likely to be observed during cases in which anaphylaxis symptoms are mild or subjective and when caregivers are inexperienced in recognizing symptoms or fearful of epinephrine self-administration. In addition, such an effect may be disparately observed among those patients already burdened by certain socioeconomic determinants of health, including financial strain, possibly widening health care disparities. Consequences of delay or omission of epinephrine during anaphylaxis treatment include a prolonged duration of symptoms and biphasic anaphylaxis, outcomes which are likely to ultimately require ED evaluation, despite the patient's original goals. Though this effect needs additional characterization, it may contribute to the well-described suboptimal rates of home epinephrine use among patients experiencing anaphylaxis.

The COVID-19 pandemic provided the original impetus for a number of urgently needed changes across health care systems. Ad hoc changes in practice were adapted to normalize the decision to continue anaphylaxis observation at home, provided both treatment and response are timely and appropriate. These changes have accelerated an evolution to precision-based anaphylaxis management, though the safety implications resulting from

these changes are poorly established. We would like to contribute further support to the low rate of biphasic anaphylaxis, by submitting our center's experience with a high-risk peanut allergy cohort undergoing entry oral food challenge. Our research observations are limited by the exclusion of patients at entry who have previously experienced an episode of severe anaphylaxis and by the infrequent occurrence of biphasic anaphylaxis during DBPCFC which may each reduce generalizability. However, our work importantly highlights that elevations in biomarkers for allergic sensitization to peanut are not independently predictive of food-triggered biphasic anaphylaxis. Although the setting of controlled clinical research as we have suggested may be ideal to precisely convey symptom chronology and timing of epinephrine administration, we acknowledge that anaphylaxis outside of a medically supervised setting is not as likely to be recognized nor treated with such rapidity. Yet, we are still hopeful that our work may both inform future research regarding biphasic anaphylaxis and encourage providers to make use of a more targeted approach to anaphylaxis counseling. Similar to previously recommended adaptations to anaphylaxis post-reaction care published at the onset of the pandemic,[2,3] we encourage providers to consider selective deferral of health care utilization for patients experiencing food-triggered anaphylaxis who lack biphasic anaphylaxis risk factors and barriers to home observation, even among children with biomarkers reflective of high degrees of peanut sensitization. Additional investigation of DBPCFC research cohorts may be useful in providing further post-reaction follow-up data and both mechanistic and clinical insight from which more robustly defined risk factors for biphasic anaphylaxis can be derived. As providers in allergy, we are uniquely positioned to lead the charge on providing more targeted guidance on routine care after the diagnosis of anaphylaxis and may even be positioned to reduce reliance on EDs.

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Successful use of dupilumab to treat eczema in a child with X-linked agammaglobulinemia

We describe here a child with X-linked agammaglobulinemia (XLA) who developed severe generalized eczema that was unresponsive to mid-potency topical corticosteroid but eventually responded to dupilumab. The patient is an 11-year-old boy who initially presented to our clinic at 11 months of age after he was discharged from an outside pediatric intensive care unit owing to respiratory distress needing intubation and assisted ventilation. He was treated with intravenous antibiotics and eventually recovered. Further history suggests that the child has had recurrent "bronchitis" episodes needing antibiotics since being 4 months old. Immune evaluation results revealed undetectable serum immunoglobulins (Igs): IgG less than 140 mg/dL, IgA less than 33 mg/dL, IgM less than 21 mg/dL, and IgE less than 2 kU/L; normal number of T and NK cells but no B cell (< 1%). A diagnosis of agammaglobulinemia was made, and intravenous immunoglobulin therapy was initiated. Genetic testing result subsequently confirmed a mutation in *BTK* gene with a hemizygous duplication in exon 15: c.1426_1430dup, p.Met477Ilefs*9,[1] confirming XLA. Since starting intravenous immunoglobulin monthly, the patient had been doing well without significant respiratory infection in the past 10 years. However, in the past 4 years, he developed a generalized dry and itchy eczematous rash (Fig 1). The itching and scratching resulted in multiple episodes of skin infections including 1 with skin abscesses that required drainage and intravenous antibiotic in the hospital. Wound culture result was positive for methicillin-sensitive *Staphylococcus aureus*. Daily skin care was implemented with bathing followed by moisturizer application multiple times throughout the day. Topical corticosteroid 0.1% triamcinolone ointment was prescribed for his eczema twice daily with some improvement, but his eczema remained generalized with excoriations and papules. His Eczema Area and Severity Index score was 23, which corresponds to the severe category of atopic dermatitis (AD).[2] Result of a punch biopsy of an eczema lesion revealed superficial perivascular dermatitis with predominant lymphocytes and few neutrophils. Tacrolimus ointment was considered but not used because of his underlying immunodeficiency. As his eczema and itch began to affect his sleep, school, and daily activities, after discussion with his parent regarding the potential use and adverse effects of dupilumab, the patient was started on dupilumab subcutaneous injection of 300 mg every 2 weeks. After 3 months of dupilumab treatment,

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