MATHEWS

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Optimising Skin Prick Test Thresholds to Support Safer and More Efficient Hospital-Based Food Allergen Introduction Pathways

Jathushaa Suthaharan[1], Thepusha Suthakaran[1], Saina Sadhwani[1], Therese-Mary William[1,2*]

[1]King's College London GKT School of Medical Education, United Kingdom

[2]NHS Education South London, United Kingdom

ABSTRACT

Introduction: Diagnosis of allergies involves Oral Food Challenges (OFCs) or Supervised Feeds (SFs). However, OFCs are resource-intensive, requiring 4 to 5 incremental allergen doses over approximately 5 hours. Whereas SFs involve a single dose over 2 hours reducing reliance on OFCs. Therefore, using SFs can shorten hospital waiting lists, ensure patient safety and reduce anxiety for families.

Aim: This quality improvement project(QIP) with prospective data collection aimed to safely increase OFC and SFs thresholds to reduce reliance on OFCs and shorten waiting times, while maintaining patient safety and diagnostic accuracy.

Methods: Two Plan-Do-Study-Act cycles were implemented. Cycle 1 increased skin prick test (SPT) thresholds from ≤2 mm to ≤4 mm for SFs, and from >2-4 mm to >4-5 mm for OFCs within a controlled hospital environment.To ensure patient safety, SPT values above 5 mm were not incorporated into the project's evaluation.Cycle 2 involves the distribution of an informational poster explaining SPTs, OFCs, and SFs, and the aim of the QIP. Patients with a previous anaphylaxis to the food allergen were excluded from the reclassification. Feedback of the informational poster was collected to assess its impact of the changes.

Results: Raising SPT thresholds increased the mean number of monthly SF appointments from 5.2 to 7.0 (34.6% increase) and a 50.0% reduction in OFCsappointments. Two anaphylaxis events occurred in each group with the old conservative thresholds, indicating that the event was unlikely to be attributable to the revised threshold. All anaphylaxis cases (100%) involved nut allergens. Overall, the revised thresholds did not increase severe reactions. Feedback on the informational poster showed that 90.9% of parents were reminded to avoid antihistamines before their child's appointment.

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***Corresponding Author**

Dr. Therese-Mary William,

Consultant Paediatrician with Special Interest in Paediatric Allergy, NHS Education South London, United Kingdom

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Conclusions: Raising SPT thresholds alongside introducing an informational poster have reduced the waiting list pressures and increased number of SFs. Clinic efficiency improved while maintaining patient safety. Given the higher risk profile of nut allergens, additional test including low specific immunoglobulin E (IgE) levels (<0.35 KAU/L) and negative component testing (<0.35 KAU/L) should remain mandatory criteria when selecting SFs rather than OFCs in infants and children with a typical history of allergy. Future studies may standardise SPT and IgE thresholds to improve diagnostic accuracy.

Keywords: Paediatrics, Allergy, Oral Food Challenge, Supervised Feed, Skin Prick Test, Anaphylaxis

INTRODUCTION

Food allergies are an increasing global health concern and can significantly affect the quality of life of affected children, with the potential to cause severe or life-threatening reactions. Beyond the medical risks, food allergies place a substantial burden on families, contributing to dietary restrictions, heightened parental anxiety and financial strain [1, 2]. Early and accurate diagnosis is therefore essential to ensure patient safety and to minimise these pressures. The prevalence of paediatric food allergy continues to rise; for example, cow's milk protein allergy affects approximately 1 in 40 infants in the UK [3].

The current gold standard for diagnosing food allergy is the Oral Food Challenge (OFC), while Supervised Feeding (SF) may be performed in carefully selected patients who are considered at low risk for developing a severe allergic reaction [4-6]. OFCs typically last around five hours and involve administering four to five incremental doses of the suspected allergen. In contrast, SFs involve a single dose delivered over approximately two hours. This makes SFs considerably more time-efficient and less resource-intensive, as one nurse can supervise multiple SFs simultaneously, whereas OFCs require one-to-one staffing.

Decisions regarding whether a child should undergo an OFC or an SF are guided by skin prick test (SPT) thresholds and Immunoglobulin E (IgE) blood tests. SPTs are quick, minimally invasive tests used to assess whether a child is sensitised to specific allergens. A tiny drop of an allergen extract is placed on the skin, and a small lancet gently pricks the skin through the drop to introduce the allergen to the surface.The results are typically read after 15 minutes, allowing time for a wheal to develop. The size of the wheal is compared with apositive control (histamine) and a negative control (saline). SPTs help identify whether the immune system recognises an allergen, which can support the diagnosis of allergic conditions. However, SPT values alone have limited specificity and do not reliably predict clinical reactivity [7,8]. As such, SPTs are used to support clinical judgement and to help determine the most appropriate diagnostic pathway rather than to confirm allergy status independently.

Timely access to diagnostic testing is crucial. When testing is delayed, children may unnecessarily avoid foods that could otherwise be safely reintroduced, potentially hindering the development of immune tolerance and prolonging dietary restrictions [8,9]. Earlier reintroduction of tolerated foods can support tolerance development and reduce the long-term impact of food allergy on children and their families.

Long waiting times for OFCs and SFs have become a significant challenge for paediatric allergy services, driven by rising referral numbers, limited OFC capacity, and the reliance on conservative SPT thresholds that classify many children into more resource-intensive pathways. These delays can prolong unnecessary food avoidance and heighten family anxiety. Therefore, understanding whether revised SPT thresholds could safely streamline decision-making is essential.

AIM OF THE STUDY

This quality improvement project with prospective data collection aimed to identify a deficit in the quality of care within a healthcare service and implement small, cumulative improvements to assist paediatricians and allergy nurses [10]. This study provides a framework for addressing delays within the paediatric allergy pathway, enabling systematic testing of targeted changes while maintaining patient safety.

The aim of this quality improvement project was to establish best practice for the timely diagnosis of paediatric food allergy. We examined how changing SPT thresholds can guide decisions about referring children to OFCs or SFs, and explored opportunities to shorten waiting times for diagnosis. The quality improvement project reviewed the entire diagnostic pathway, from initial GP referral through to the final decision on diagnostic method, to identify delays associated with the current low SPT thresholds and to determine whether revised thresholds could support a more

efficient and equitable service.

Hence, we aimed to evaluate whether SPT thresholds could be safely increased for suspected food allergies, specifically, from ≤2 mm to ≤4 mm for SFs, and from >2-4 mm to >4-5 mm for OFCs within a controlled hospital environment. SPT values above 5 mm were not considered in this project.The objective was to expand the number of patients eligible for SFs and reduce the number requiring OFCs with particular attention to patients' safety. Using this operational change, clinic flow (patient throughput) was improved, waiting times were reduced, while patient safety was maintained. Reclassifying borderline SPT results shifts some patients from OFCs (resource-intensive and longer appointments) to SFs (shorter appointments and higher throughput). We aimed to increase the number of SF appointments that would have previously been OFCs by 20% over four months. Increasing SF capacity directly increases the number of patients who can be assessed per clinic session. Throughout the project, patient safety remained the primary focus. Higher SPT thresholds were applied only where evidence indicated that the risk of reaction during SFs remained acceptably low.

To address this aim, we undertook a structured evaluation of the existing diagnostic pathway and implemented a targeted intervention to test whether revised SPT thresholds could safely improve service efficiency. The following section outlines the methodological approach used to assess the impact of these changes, including study design, participant selection, data collection, and analysis.

METHODS

Setting and Context

The QI project ran from October 2024 to February 2025 across two urban hospitals which provide paediatric allergy service, with established protocols for allergy testing and challenge procedures, ensuring consistency in how the revised SPT thresholds were evaluated. This setting was selected because it provides a controlled clinical environment, established emergency protocols and multidisciplinary expertise relevant to evaluating potential changes to SPT thresholds. Baseline activity data were collected from January 2024 up to the implementation of the first PDSA cycle, providing a clear pre-intervention reference point.These baseline figures were used to assess the impact of increasing the SPT thresholds by allowing direct comparison of service activity, patient flow, and waiting times before and after the intervention. Before the QI project, the hospitals implemented the SPT thresholds of ≤2 mm for SFs, and from >2-4 mm for OFCs.

Study Design

The study was designed to assess the safety and feasibility of increasing the SPT thresholds to improve food allergy services within healthcare. The data gathered was used to determine eligibility for screening SFs and OFCs.

Data Sources and Participants

Data were obtained from patients' electronic medical records. Children awaiting SFs or OFCs for a range of food allergens were included, provided they had no history of anaphylaxis to the relevant allergen. For safety reasons, children awaiting OFCs who had previously experienced anaphylaxis to the specific food allergen were excluded from re-stratification and remained allocated to OFCs under the existing pathway to prevent adverse outcomes. Information sheets including details of the SPT changes were provided to participants' parents. Informed parental consent was obtained prior to voluntary participation and before applying the revised SPT thresholds to individual cases. All participants' data were anonymised. Identifiable information confidentiality was removed.

Ethical Considerations

As this project focused on evaluating and improving an existing clinical pathway, no formal Research Ethics Service (REC) review was required under UK National Research Ethics Service (NRES) guidance.

Intervention

Two Plan-Do-Study-Act (PDSA) cycles were used to introduce, evaluate and refine the revised SPT thresholds across the two hospital sites delivering paediatric allergy services. The first intervention consisted of raising the SPT thresholds used to allocate children to SFs or OFCs. The second intervention aimed to further support parental understanding and informed decision-making by developing an informational poster explaining SPTs, SFs, OFCs and the rationale for the revised thresholds. The infographic also addressed common parental misconceptions about SFs to improve confidence in the re-stratification process. During the study period, all eligible patients were re-classified according to the higher

SPT thresholds, and their subsequent challenge allocation (SFs vs OFCs) was recorded.

Outcome Measures

The primary outcome was the impact of the revised thresholds on service demand. This was assessed by comparing the mean number of SFs and OFCs performed before and after the threshold change, and the proportion of patients re-allocated from OFCs to SFs, enabling assessment of how the revised thresholds influenced overall clinic activity. The balance measures focused on safety, including the incidence of adverse reactions, specifically anaphylaxis after implementation, as well as the number of families who declined an SFs despite being newly eligible. These measures ensured that improvements in efficiency did not compromise patient safety or parental confidence. Secondary outcomes included changes in waiting pressures.

Analysis

Descriptive analysis summarised and visualised the data collected to understand the current state of the food allergen diagnosis system, comparing activity levels before and after the intervention. Trends in SFs and OFC numbers were examined using run charts to determine whether the revised thresholds increased SFs capacity and reduced reliance on OFCs. Waiting list data were reviewed to assess operational impact on service pressures.

Stakeholder Engagement

Stakeholder engagement was central to the successful implementation of the revised SPT thresholds. The individual with both high interest and high power included the project supervisor. Other paediatric consultants and specialist allergy nurses played a crucial role in managing the project closely. These stakeholders provided clinical oversight, ensured adherence to safety protocols, and guided decision-making throughout the PDSA cycles. The project team, comprising final-year medical students with a high interest, contributed to pathway mapping, data collection and day-to-day implementation of the project. Their involvement supported consistent monitoring of the intervention and facilitated rapid adjustments during each PDSA cycle.

Families of patients were also recognised as essential stakeholders. As end users of the service, they provided feedback on the acceptability of the revised thresholds, the experience of undergoing SFs or OFCs, and the perceived impact on waiting times and overall care. Their insights helped ensure that operational improvements aligned with patient-centred outcomes and maintained trust in the diagnostic process.

PDSA Cycle 1: SPT Thresholds Adjustment (21 October 2024-9 February 2025)

The first PDSA cycle focused on raising the existing SPT thresholds to determine whether more children could be safely stratified to the SFs pathway rather than the OFCs pathway. Following implementation, the number of OFCs and SFs performed was monitored to assess the immediate impact of the threshold change on patient flow. All adjustments were introduced within a controlled hospital environment, supported by established anaphylaxis protocols and predefined escalation procedures to ensure patient safety in the event of an adverse reaction. The expectation was that increasing the SPT thresholds would result in a higher proportion of SFs, many of which would previously have been classified as OFCs, thereby reducing the OFC backlog. This shift was intended to free OFC capacity for children with SPT values >4 mm and those with a high risk of anaphylaxis.

PDSA Cycle 2: Educational Poster (10 February 2025-28 February 2025)

During PDSA Cycle 1, discussions with families revealed that some parents were reluctant to proceed with SFs, even when their child was eligible, due to the perception that SFs were less safe than OFCs. Additional barriers included parents administering antihistamines before appointments, rendering SPT results unreliable and forgetting to bring allergens required for SFs or OFCs. These issues contributed to delays, cancellations, and reduced service efficiency.

To address these concerns, PDSA Cycle 2 focused on targeted education through the development of an informational poster designed to improve parental understanding of SFs and OFCs. The poster was visually engaging and highlighted key messages about safety, preparation requirements, and the purpose of each diagnostic pathway. The aim was to enhance parental confidence in SFs, reduce avoidable cancellations, and improve overall appointment readiness.

To evaluate the impact of the poster, both qualitative and quantitative feedback were collected *via* a structured

Google Forms survey. This allowed assessment of changes in parental understanding, perceived safety, and preparedness following the introduction of the educational intervention.

RESULTS

SPT Thresholds Change (PDSA Cycle 1)

The primary outcome measure was achieved, with 21 of the 29 completed SF appointments (72.4%) representing cases that would previously have required OFCs under the former SPT thresholds. This demonstrated that the revised SPT thresholds successfully shifted a substantial proportion of children into the SFs pathway. To account for differences in the duration of the intervention period, mean monthly activity was also calculated. The average number of SFs performed per month increased by 34.6 %, while the number of OFCs decreased by 50.0%. These changes reinforced the process measure by showing a clear redistribution of diagnostic activity following implementation of the new thresholds, with a marked reduction in OFCs demand and a corresponding increase in SFs throughout.

As shown in the run charts (Figures 1-4), data were collected over a 22-week period from 30 September 2024 to 28 February 2025. The SF run chart demonstrated week-to-week variation, with most data points falling above the median. In contrast, the OFC run chart showed greater variability and a notable shift to zero after 13 January 2025, indicating a sustained reduction in OFCs activity during the latter part of the project period.

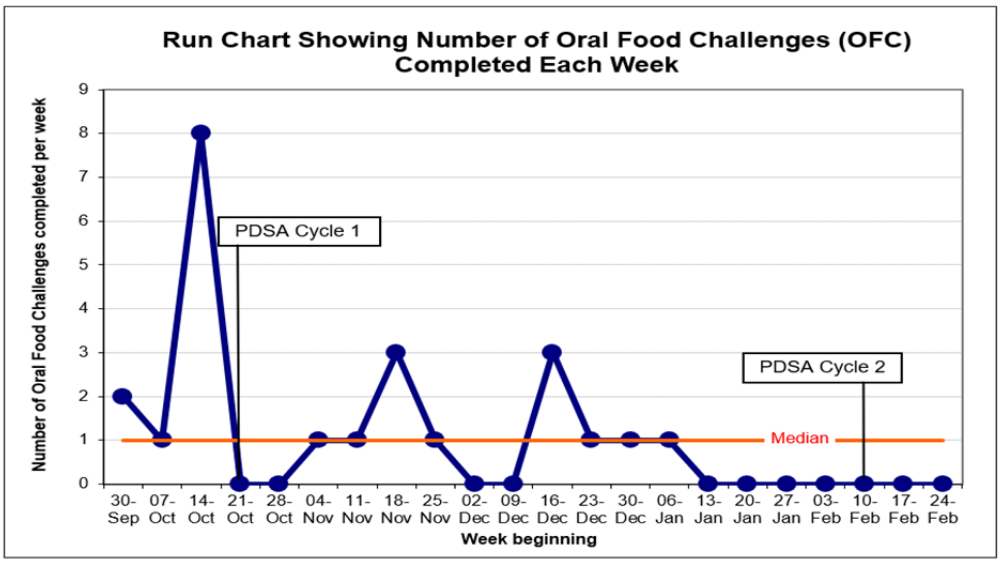

Figure 1: Run chart showing OFC outcomes before and after PDSA cycle 1 and 2.

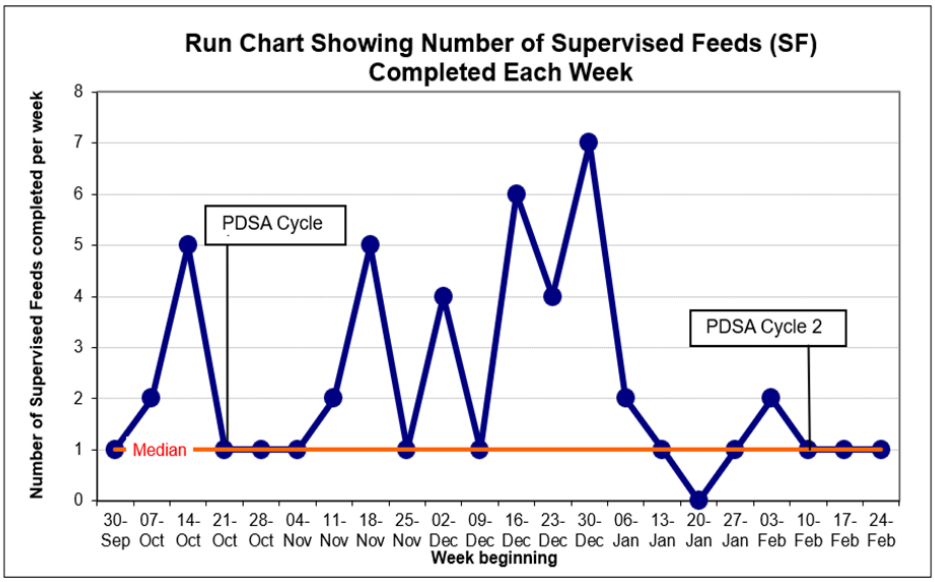

Figure 2: Run chart showing SF outcomes before and after PDSA cycle 1 and 2.

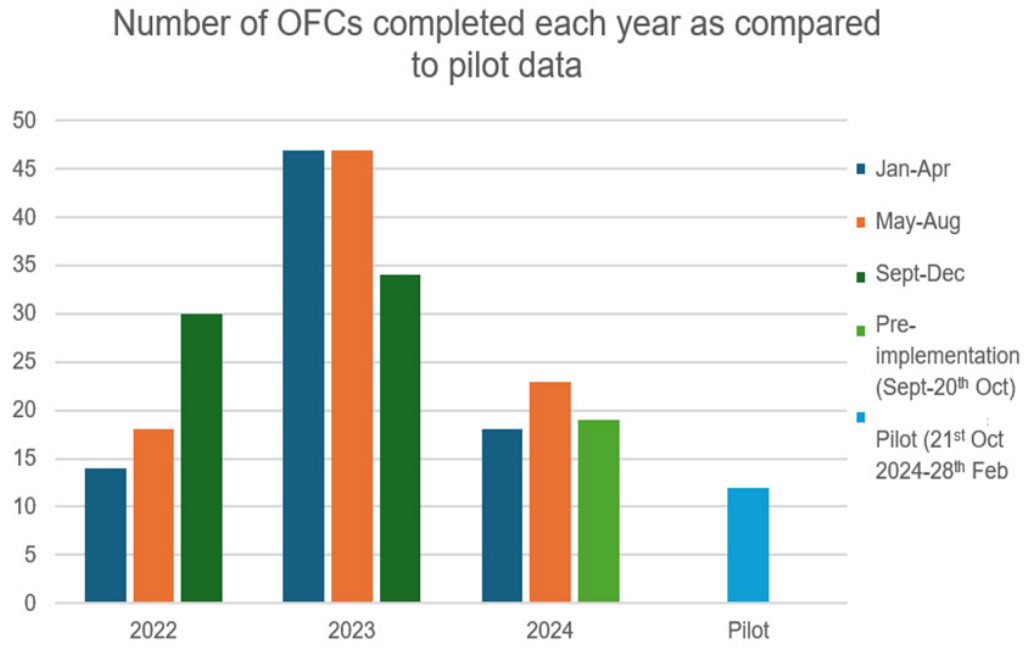

Figure 3: Bar chart showing number of OFCs completed four-monthly in 2022, 2023 and 2024 (before implementation of threshold change) compared to pilot data.

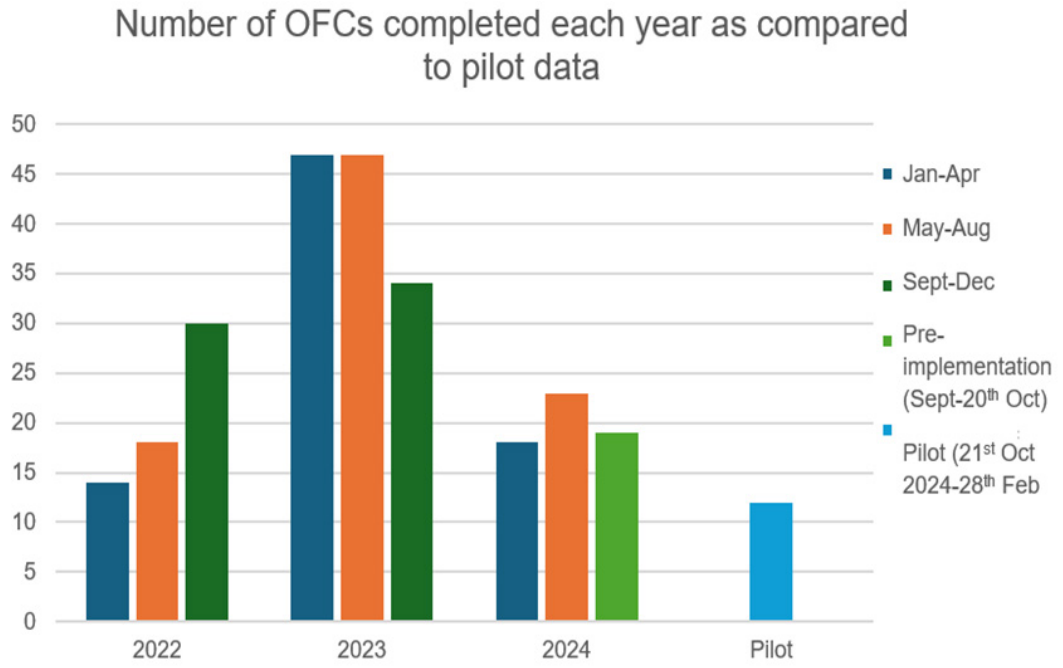

Figure 4: Bar chart showing number of SFs completed four-monthly in 2022, 2023 and 2024 (before implementation of threshold change) compared to pilot data.

Overall Activity and Outcome Measures

Between 30 September 2024 and 28 February 2025, a total of 12 OFCs and 29 SFs were completed. Of the SFs performed post-implementation, 72.4% would previously have been classified as OFCs under the former SPT thresholds, demonstrating a substantial shift in patient stratification and confirming that the primary outcome measure was achieved.

To account for differences in project duration, mean monthly activity was calculated. The average number of SF appointments increased by 34.6 % (from 5.2 to 7.0 per month), while OFCs decreased by 50.0% compared with pre-implementation activity (January to 30 September 2024). Following the threshold change, OFC numbers fell to their lowest level when compared with equivalent periods in 2022, 2023 and 2024 (Figure 3). SFs activity increased relative to 2022 and 2024 (pre-threshold change) and remained consistent with 2023 levels, indicating that the intervention increased SFs throughput without exceeding historical capacity (Figure 4).

Balance Measures: Safety and Acceptability

Across the intervention period, no increase in severe reactions was observed. One SFs-related anaphylaxis occurred in a child whose SPT result (0.5 mm) fell within the previous conservative threshold, indicating that this event was unlikely to be attributable to the revised threshold. All anaphylaxis cases (100%) were associated with nut allergies, consistent with known higher-risk allergens. No IgE blood test was available for those patients. No anaphylaxis events were recorded in 2022 or in 2024 prior to the threshold change, while 2023 recorded two cases across the year. The overall pattern suggests that the revised thresholds did not increase the incidence of severe reactions.

Educational Intervention Findings (PDSA Cycle 2)

Analysis from PDSA Cycle 1 showed that approximately 10% of parents preferred OFCs over SFs, despite their children being eligible for SFs. Discussions with clinic staff indicated that this preference was often driven by misconceptions about the relative safety and purpose of SFs. Additional operational issues, such as parents administering antihistamines before appointments or forgetting to bring allergens, also contributed to delays and cancellations. These findings informed the development of an informational poster for PDSA Cycle 2, aimed at improving parental understanding and appointment preparedness.

Feedback on the poster was collected through a Google Forms survey, providing both qualitative and quantitative insights into its effectiveness. Eleven parents completed the survey, with all respondents identifying as parents and no healthcare professionals participating. The most frequently cited positive feature was the poster's clear and concise information (63.6%), indicating that parents found the content easy to understand. Additional comments described the poster as "great" and "informative," reflecting strong acceptability.

Feedback on suggested improvements was varied. Just over a third of respondents (36.4%) indicated that no changes were needed. Among those who suggested refinements, the most common recommendations included reducing text density, adjusting specific wording for clarity, and adding a clearer "numerical order" or stepwise layout to improve readability and navigation. Importantly, 90.9% of parents reported that the poster effectively reminded them to avoid antihistamines before their child's appointment, addressing one of the key operational barriers identified in PDSA Cycle 1 (Figure 5).

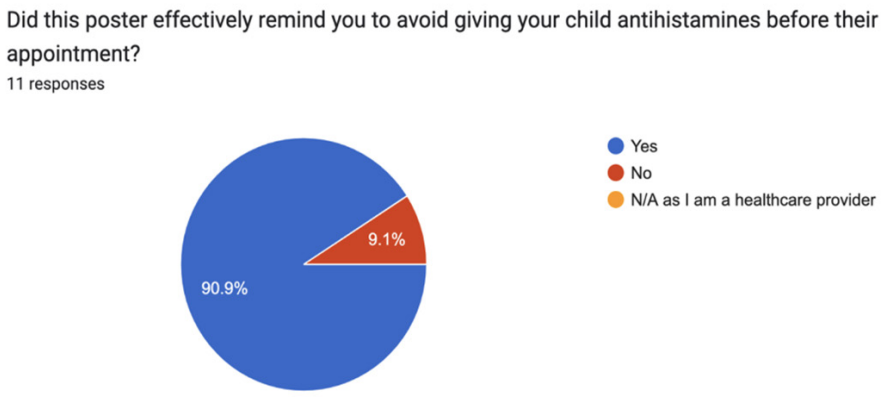

Figure 5: Pie chart showing survey responses on the effectiveness of the educational poster in reminding parents to avoid giving their child antihistamines before their appointment.

We conducted an analysis that enabled a systematic categorisation of the contributing factors impacting the paediatric allergy diagnostic pathway. The findings highlighted several key issues, including communication gaps linked to limited patient engagement and failure to read the pre-appointment information leaflet. As a result, parents often misunderstood what was required for their child's appointment, for example, administering antihistamines beforehand, which invalidates SPT results, not bringing the relevant food allergens needed for OFCs or SFs or failing to attend the scheduled appointment. Resource constraints were also identified, such as high demand on the allergy service, and limited clinic capacity and staffing. These factors collectively contributed to prolonged waiting times and delays in progressing children through the diagnostic pathway.

Summary of Findings

Together, the outcome, process and balance measures demonstrate that raising the SPT thresholds successfully shifted a substantial proportion of children from the OFCs to the SFs pathway, reduced OFC demand, and improved clinic efficiency without increasing the incidence of severe adverse reactions. The educational intervention in PDSA Cycle 2 further supported these operational improvements by addressing parental misconceptions and enhancing appointment preparedness. Although SFs activity showed natural variation and OFC numbers declined markedly, the overall pattern indicates that the combined interventions improved pathway flow while maintaining safety and acceptability for families.

DISCUSSION

This QI project demonstrated that raising the SPT thresholds effectively shifted a substantial proportion of children from the OFCs to the SFs pathway, reduced OFC demand, and improved overall clinic efficiency without compromising patient safety. The marked reduction in OFCs, alongside the sustained increase in SFs activity, indicates that the revised thresholds successfully addressed the service throughput limitation, operational barrier and capacity constraint identified at baseline. The educational intervention further supported these operational gains by improving parental understanding, reducing misconceptions, and enhancing appointment preparedness. Together, these findings highlight the potential for simple, targeted changes supported by clear communication to optimise paediatric allergy pathways while maintaining high standards of safety and patient experience.

Our findings demonstrated that modest adjustments to SPT thresholds can meaningfully reduce OFC demand while maintaining safety, as reflected by the stable rate of anaphylaxis and the fact that reactions were confined to high-risk allergens such as nuts. The positive response to the educational intervention also echoes previous work showing that parental understanding and preparation significantly influence the efficiency and safety of allergy pathways. Together, these parallels suggest that the combined approach of threshold optimisation and targeted education is consistent with broader trends in paediatric allergy management and may be generalisable to similar services.

Several contextual factors contributed to the successful implementation of the revised SPT thresholds and the associated changes in SFs and OFCs activity. Clear and consistent communication between the paediatric allergy clinic staff and the project team ensured that data, pathway adjustments, and safety considerations were understood by all stakeholders, enabling smooth day-to-day operation of the new thresholds. Strong collaboration within the team further supported rapid problem-solving, particularly when addressing parental misconceptions and operational barriers identified during PDSA Cycle 1. In addition, supervisor support played a key role in disseminating the educational poster and reinforcing its messages across clinical areas, which helped maximise its visibility and impact. Together, these factors created an environment that facilitated effective implementation and sustained engagement throughout the project period.

The increase in the mean number of SF appointments indicates that a greater proportion of children were safely able to undergo an SFs without requiring a full OFCs. Correspondingly, the reduction in the mean number of OFC appointments suggests that the adjusted SPT thresholds effectively reduced the need for OFCs. When considering all collected data, the primary outcome of the project was achieved: more patients were appropriately stratified to SFs following the threshold change, reducing reliance on the longer and more resource-intensive OFCs pathway. This refined stratification process ensured that OFCs were

prioritised for children with larger SPT wheal sizes and those with a history of anaphylaxis or considered at high risk. By shifting a larger proportion of patients to SFs, the clinic was able to accommodate more appointments within existing resources while maintaining safety, thereby improving efficiency.

Estimated Impact on Waiting Times

These operational improvements translated into a notable reduction in waiting times, which fell by approximately 20% during the project period. This reduction is consistent with the increased use of SFs and the corresponding decrease in OFCs, which collectively improved clinic throughput. Although cancellation rates were not measured, the shift away from resource-intensive OFCs likely contributed significantly to this improvement.

Safety Considerations and Implications for Threshold Refinement

Despite the overall improvements in efficiency, the rise in anaphylaxis cases across both SF and OFC groups highlights the need for continued vigilance in safety monitoring. Notably, all four anaphylaxis cases involved nut allergens, and one occurred in a child whose SPT wheal size (0.5 mm) fell within the previous conservative threshold, suggesting that the threshold change itself was not the sole driver of risk. Nevertheless, these findings highlight the need for distinct assessment of nut allergens and support the use of mandatory specific IgE testing before determining eligibility for Supervised Feeding. For nut allergens, additional specific IgE level (≤0.35 KAU/L) and component test (≤0.35 KAU/L) should be considered mandatory criteria in infants and children with typical history of allergy, when determining suitability for SFs versus OFCs. Thereby, mitigating risk without diminishing the efficiency gains observed for other food allergens, given the higher risk profile of nut allergies. Ongoing data collection and iterative refinement of the threshold scheme will be essential to maintaining an appropriate balance between improved service flow and patient safety.

Sustainability Considerations

Assessment of sustainability through the triple bottom line framework, including financial, social, and environmental impact, provides further insight into the broader implications of the project. Financially, the shift from OFCs to SFs optimised resource allocation by reducing reliance on longer, more staff-intensive appointments, thereby improving operational efficiency. Socially, the project had a largely positive impact: reduced waiting times and improved patient flow likely alleviated parental anxiety and enhanced the overall care experience. The environmental impact was minimal; while fewer OFCs may have reduced resource use initially, this was counterbalanced by the additional emergency interventions required, resulting in an uncertain net environmental effect. This reinforces the need for careful risk communication and tailored safety protocols. Together, these considerations emphasise the importance of embedding safety-focused refinements into future cycles to ensure that efficiency gains remain sustainable across all dimensions.

CONCLUSION

Raising the SPT thresholds, combined with targeted parental education, successfully improved patient stratification, reduced reliance on OFCs, and enhanced clinic efficiency without compromising overall safety. The project demonstrated that small, evidence-informed adjustments to diagnostic pathways can produce meaningful operational benefits, particularly when supported by clear communication and collaborative implementation. However, the increased incidence of anaphylaxis in nut challenges underscores the need for allergen-specific caution and further refinement of the threshold criteria before determining eligibility for SFs. For nut allergens, additional specific IgE level (≤0.35 KAU/L) and negative component test (≤0.35 KAU/L) should be considered mandatory criteria when determining suitability for SFs versus OFCs, in infants and children with typical history of allergy, given the higher risk profile of nut allergies. Given the relatively small cohort and the four episodes of anaphylaxis recorded during the intervention period, we acknowledge that the statistical power of the study may have been insufficient to detect clinically significant differences in adverse event rates. Sustained data collection, iterative testing, and continued engagement with families and clinical staff will be essential to ensuring that the efficiency gains achieved remain safe, equitable, and sustainable over time.

LIMITATIONS OF THE STUDY

The project was conducted within a single paediatric allergy service with a small sample size, which may

limit generalisability to settings with different patient demographics, staffing models or diagnostic pathways. This also makes it difficult to draw definitive conclusions about safety trends following the threshold change. Data collection relied partly on parent-reported feedback, which may be subject to recall or response bias, especially regarding perceptions of safety. The duration of the intervention period was also limited, restricting the ability to assess long-term sustainability or seasonal variation in referral patterns. Additionally, although the educational poster improved parental understanding, its impact on actual behaviour, such as allergen preparation, was not directly measured. Finally, while the rise in anaphylaxis cases prompted important safety considerations, the project design did not allow for detailed analysis of confounding factors such as co-existing atopic conditions. These limitations highlight the need for ongoing monitoring, larger datasets, and further refinement of the threshold criteria, particularly for nut allergens.

RECOMMENDATIONS

Several recommendations emerge from this project to support the continued optimisation and safe delivery of paediatric allergy services:

Refine SPT thresholds criteria with allergen-specific caution: Given that all anaphylaxis cases involved nut allergens, future iterations of the threshold scheme should consider additional specific IgE level (≤0.35 KAU/L) and negative component test (≤0.35 KAU/L) as mandatory prerequisites when determining suitability for SFs versus OFCs in infants and children with typical history of allergy, reflecting their higher risk profile. Further, British Society for Allergy and Clinical Immunology (BSACI) does not specify IgE cut off values for determining OFCs eligibility, noting only that higher peanut specific IgE (≥15 KAU/L) or large SPT wheals (≥8 mm) are strongly predictive of clinical allergy, and that validated cut offs are not available for tree nuts. Consequently, our supervised feed inclusion criteria adopt stringent low risk thresholds, such as IgE ≤0.35 KAU/L and negative component tests, to ensure SFs are reserved for children in whom a reaction is not expected [11]. In addition, the basophil activation test (BAT) is an emerging diagnostic tool with excellent sensitivity and specificity that enhances the interpretation of specific IgE results and can help avoid oral food challenges in patients who test positive [12].

Continue systematic safety monitoring: Ongoing surveillance of adverse reactions, particularly anaphylaxis, is essential to ensure that efficiency gains do not compromise patient safety. Regular review of reaction patterns may help identify emerging risks and guide further refinements to the pathway.

Sustain and expand educational interventions: The positive impact of the informational poster suggests that continued investment in parent-focused education, potentially through digital resources, pre-appointment reminders, or enhanced clinic materials, could further improve preparedness and reduce avoidable delays.

Explore broader implementation across similar services: There is potential for wider adoption of adjusted SPT thresholds and educational interventions in comparable paediatric allergy clinics, with local adaptation as needed.

Evaluate resource implications more comprehensively: Future cycles should include a more detailed assessment of financial and environmental impacts, particularly considering the balance between reduced OFC demand and potential increases in emergency care utilisation.

STATEMENTS

Conflicts of Interest and Source of Funding

None has been declared.

Author Contributions

Dr. William conceived the idea for this study. Dr. Jathushaa Suthaharan, Dr. Thepusha Suthakaran and Dr. Saina Sadhwani collected and analysed the data. All authors contributed substantially to the manuscript and have approved the final submitted version.

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REFERENCES

1. Memauri TD, Golding MA, Gerdts JD, Simons E, Abrams EM, Elliott SJ, et al. (2022). The perceived impact of pediatric food allergy on mental health care needs and supports: A pilot study. J Allergy ClinImmunol Glob. 1(2):101–107.
2. Seth D, Poowutikul P, Pansare M, Kamat D. (2020). Food allergy: A review. Pediatr Ann. 49(1):e50–e58.

3. Grimshaw KE, Bryant T, Oliver EM, Martin J, Maskell J, Kemp T, et al. (2016). Incidence and risk factors for food hypersensitivity in UK infants: Results from a birth cohort study. ClinTransl Allergy. 6:1.

4. Calvani M, Bianchi A, Reginelli C, Peresso M, Testa A. (2019). Oral food challenge. Medicina (Kaunas). 55(10):651.

5. (2023). EAACI guidelines on the diagnosis of IgE-mediated food allergy. Allergy. 78(12):3057-3076.

6. Chong KW, Saffari SE, Chan N, Seah R, Tan CH, Goh SH, et al. (2019). Predictive value of peanut skin prick test, specific IgE in peanut-sensitized children in Singapore. Asia Pac Allergy. 9(3):e21.

7. Kattan JD, Sicherer SH. (2015). Optimizing the diagnosis of food allergy. Immunol Allergy Clin North Am. 35(1):61–76.

8. Turcanu V, Brough HA, Du Toit G, Foong RX, Marrs T, Santos AF, et al. (2017). Immune mechanisms of food allergy and its prevention by early intervention. Curr Opin Immunol. 48:92-98.

9. Mehta H, Groetch M, Wang J. (2013). Growth and nutritional concerns in children with food allergy. Curr Opin Allergy ClinImmunol. 13(3):275-279.

10. Miller K. The triple bottom line: What it is & why it's important. Business Insights Blog.

11. Stiefel G, Anagnostou K, Boyle RJ, Brathwaite N, Ewan P, Fox AT, et al. (2017). BSACI guideline for the diagnosis and management of peanut and tree nut allergy. Clin Exp Allergy. 47(6):719-739.

12. Gomes-Belo J, Hannachi F, Swan K, Santos AF. (2018). Advances in Food Allergy Diagnosis. Curr Pediatr Rev. 14(3):139-149.