DOI: 10.1111/cea.14393

ABSTRACT

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# British Society for Allergy and Immunology (BSACI) Abstracts of the 2023 UK Conference (5–7 October, Harrogate Convention Centre, Harrogate, UK)

## Adult clinical

### A001 | Single-centre experience of triggers and outcomes following peri-operative anaphylaxis between 2020 and 2022

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**Objectives:** The NAP6 report 2018 highlighted deficiencies in adherence to guidelines and service capacity for specialized peri-operative allergy referrals. We audited referrals between 2020 and 2022 to understand where improvements are still required.
**Method:** Retrospective audit (using NAP6 standards) designed to identify: (1) Outcome of acute management and time-to-review at the allergy clinic; (2) Outcome of testing and (3) Pharmacovigilance (hospital records updated/communication with primary care).
Standardized referral forms (from NAP6 report) used to identify patients for the audit.
**Results:** Eighteen patients (12 females, six males; age mean ± SD 56.9 ± 19.8 years) were referred following suspected peri-operative anaphylaxis. All patients had undergone surgeries under general anaesthesia, exposed to average six drugs during the procedures. No patients had long-term consequences. Average time-to-review 12 months (2–32 months), pre-pandemic time-to-review 4–7 months (national 18-week target: 38%).
Fourteen patients (78%) had mast cell tryptase (MCT) level measured within 2 h of event with median MCT 6.65 ng/mL (2.20–87.7 ng/mL). All patients had baseline level checked with median MCT 4.10 ng/mL (2.30–17.1 ng/mL). One patient had tryptase rise >50 ng/mL confirming anaphylaxis (rocuronium-induced) while dynamic tryptase algorithm (baseline*1.2 + 2 ng/mL) identified five more patients consistent with acute mast cell degranulation.
Extensive testing identified six patients with drug sensitivities [opiates(2), teicoplanin(1), rocuronium(1), co-amoxiclav(1), patent blue(1)], five in concordance with the anaesthetist's suspect trigger (83%). Four patients identified to have additional sensitivities [pan NMBA sensitivity(1), atracurium(3), amoxicillin(1)]. Testing proved negative for 12 patients, but one patient listed as allergic to suxamethonium (recorded by anaesthetist). All patients had allergy alerts on system and GP letters highlighted outcome of testing (patients also copied into letters).
**Conclusions:** Testing identified NMBA as commonest trigger but only a third of referrals. Dynamic tryptase algorithm increased diagnostic yield by 43%. Significant reduction in time to review required to address anxiety among patients.

### A002 | DRESS syndrome with multiple drug hypersensitivity to micafungin, vancomycin and ciprofloxacin, confirmed via delayed intradermal and drug provocation tests

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**Objectives:** Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) syndrome is a rare and potentially life-threatening type IV T-cell-mediated severe cutaneous adverse reaction, typically characterised by fever, rash, lymphadenopathy, facial oedema, eosinophilia and/or organ involvement. Common drug culprits include antimicrobials, anticonvulsants, NSAIDs or sulphonamides. Here, we describe a novel case of DRESS with multiple drug hypersensitivity (MDH) to micafungin, vancomycin and ciprofloxacin.
**Method:** A 58-year-old female with CKD stage V developed sepsis shortly after commencing haemodialysis. Following medical admission, she was noted to have an extensive purpuric rash and maculopapular exanthem (MPE), with fever (38.6C), hypereosinophilia ($19.8 \times 10^9$/L) and transaminitis. There was no mucosal involvement, blistering, or desquamation. In the 18-day pre-rash onset, she received: chlorhexidine, enoxaparin, cyclizine, codeine, micafungin, fluconazole, vancomycin, gentamicin and ciprofloxacin. She recovered 2 weeks following drug discontinuation. She was diagnosed with probable DRESS (RegiSCAR = 5).
Four-months later, patch testing to all drugs were negative. Subsequent delayed intradermal tests (IDT) revealed positive reactions to micafungin and vancomycin. Drug provocation tests (DPT) to enoxaparin, gentamicin, codeine, fluconazole and cyclizine were negative,

  

however there was a positive DPT to Ciprofloxacin (mild DRESS reactivation in <48 h: MPE, mild eosinophilia ($1.16 \times 10^9$/L), skin biopsy consistent), which resolved with prednisolone.

**Results:** We report a novel case of DRESS with MDH to micafungin, vancomycin and ciprofloxacin, confirmed via delayed IDT and DPT. Notably, we describe the first case of Micafungin implicated in DRESS. Skin testing and DPT are helpful in identifying the culprit(s); however, DPT in DRESS should be undertaken with caution, and only conducted in specialist centres with Type IV drug allergy expertise.

**Conclusions:** MDH is a novel syndrome that develops due to massive T-cell stimulation and is characterised by long-lasting drug hypersensitivity to multiple structurally unrelated drugs. It is commonly seen in DRESS (~25% cases) and should be considered by all physicians involved in managing these patients.

## A003 | Severe maculopapular exanthema with multiple drug hypersensitivity to Co-trimoxazole, Amikacin, Piperacillin/Tazobactam, and Meropenem, confirmed by patch and intradermal testing

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**Objectives:** *Background*: Delayed Type IV drug hypersensitivity reactions are T-cell-mediated and range from maculopapular exanthema (MPE) to severe cutaneous adverse reactions (i.e. DRESS, AGEP). Cross-reactivity is classically described between drugs with shared chemical properties (i.e. penicillin). Conversely, Multiple Drug Hypersensitivity (MDH) to two or more unrelated drugs is uncommon.

**Method:** *Case Presentation*: A 54-year-old female with a background of hairy cell leukaemia was admitted for neutropenic sepsis. After 48 h, she developed facial erythema and oedema. Over 72 h, this progressed cephalocaudally to a generalised MPE with perifollicular haemorrhage. There was no blistering, mucosal/organ involvement or eosinophilia. Skin biopsy was consistent with morbilliform drug eruption. In the 9 days preceding rash onset, she received co-trimoxazole, allopurinol, amikacin, piperacillin/tazobactam, meropenem, domperidone and cladribine. She recovered 2 weeks following drug discontinuation.

Three-months later, patch testing to all drugs involved revealed positive reactions to co-trimoxazole, amikacin, piperacillin/tazobactam, meropenem, with additional positive reactions to penicillin V, amoxicillin and trimethoprim. There were negative results for allopurinol, domperidone and cladribine. Delayed intradermal testing (IDT) to amikacin and meropenem were also positive (to exclude neighbouring patch test spread from strong positive piperacillin/tazobactam reaction). Drug provocation tests (DPT) to allopurinol and domperidone were subsequently negative. Cladribine did not undergo DPT due to both safety (neutropenic fever/sepsis risk) and cost.

**Results and Discussion:** We report a rare case of severe MPE (delayed-type hypersensitivity) with MDH to co-trimoxazole (including Trimethoprim), amikacin, piperacillin/tazobactam and meropenem, confirmed by patch testing and IDT—with additional notable evidence of penicillin cross-reactivity. MDH is a novel syndrome mostly observed in severe MPE and SCAR (incidence 10%–13%), which develops due to strong T-cell activation, and features persisting drug hypersensitivity to multiple structurally unrelated drugs.

**Conclusions:** We describe a rare case of MDH to four structurally unrelated antimicrobials and highlight the utility of comprehensive delayed skin testing.

## A004 | Delayed Iodinated contrast media hypersensitivity reaction with delayed positive skin test: A case report

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**Objectives:** *Background*: Iodinated contrast media (ICM) cause both immediate and nonimmediate hypersensitivity reactions. Recently there is a paradigm shift in the usefulness of skin testing to investigate these reactions.

**Method:** *Case Presentation*: 56-year-old male with recent surgery for extensive aortic dissection attended for investigation of possible allergic reaction to contrast media (CM) 2 months ago. He underwent CT and MRI around the same duration and developed a widespread skin rash and intense pruritus post-scan. There was uncertainty if he reacted to MRI or CT contrast media as the timing of the reaction was unclear.

He underwent skin testing. The immediate results of the skin prick test (neat) and intradermal test (IDT) (1:10) with Ioversol (Optiray), Iohexol (Omnipaque), Iodixanol (Visipaque), Iomeprol (Iomeron), Gadobutrol (Gadovist) and Gadoterate (Dotarem) were negative. He was challenged with Iohexol and observed for 2 h. No immediate allergic reaction was observed.

He reported a delayed allergic reaction that manifested as widespread skin rash, and pruritus 5 h post-ICM. The delayed results of skin testing with other CMs were not interpretable due to widespread erythema. To re-explore ICM options for surveillance scans, skin testing was repeated with Ioversol, Iodixanol and Iomeprol. Immediate results with IDT were negative. He reported an increase in wheal size with localised redness and pruritis 5 h post-IDT. Since then, he had an MRI with contrast without reaction.

**Results and Discussion:** ICM-induced hypersensitivity reactions have previously been classified as nonallergic reactions and skin tests were regarded as inappropriate tools. Recent studies have reported positive skin tests in patients with immediate and nonimmediate hypersensitivity reactions after ICM exposure, which indicates that immunological mechanisms may be involved.

**Conclusions:** Our results were reproducible to index reaction. We also confirmed delayed hypersensitivity to other ICM agents by a delayed positive skin test. There is high cross-reactivity in a delayed reaction to different ICMs.

## A005 | Reactions to Day and Night Nurse medications: A case series

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**Objectives:** Background: Preparations containing pholcodine were recently withdrawn from the UK market due to a possible association with allergy to NMBAs during general anaesthesia. The authors aimed to review causes of reactions to Day and Night Nurse preparations (D/N) containing pholcodine from their database.

**Method:** *Case presentation*: Six cases were identified who had eight reactions to D/N. Five reactions were to Night Nurse capsules or liquid and three to Day Nurse capsules. Three patients also had reactions to paracetamol, one prior to and two following the reaction to D/N. Seven reactions were immediate (within an hour), and one was delayed by 1.5 h. Six reactions were possible anaphylaxis, with one being severe and requiring adrenaline, one urticaria and angioedema and one erythema with pruritus. The reactions with paracetamol were possible anaphylaxis, with one being severe and requiring adrenaline. Tryptase was normal after one reaction with D/N but was raised after one severe reaction with paracetamol.

**Results:** Discussion: Oral challenges with D/N or its individual ingredients were done in five out of six patients. The cause was identified as paracetamol in four cases, promethazine in one case, and no cause was found in one after negative challenge to the index drug. Skin testing with paracetamol was positive in one out of the three patients tested.

**Conclusions:** The most common cause of reaction to D/N was paracetamol, with promethazine being responsible for one case. No cases of allergy to pholcodine were identified. Given the recent controversies with pholcodine, more work is needed to establish its relevance as a cause of drug allergy. Paracetamol is not usually suspected as a cause as two patients took it despite prior reactions to D/N. A systematic approach is necessary to identify the cause of reactions to drugs containing multiple ingredients.

## A006 | Diagnosing clavulanic acid allergy: Does it have a role in routine penicillin allergy investigations in the UK?

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**Objectives:** Co-amoxiclav is the most commonly used antibiotic worldwide. In the United Kingdom, however, it is generally reserved for more severe infections and amoxicillin is the commonest antibiotic used. Also, in stark contrast with European data (Torres-Rojas 2023) isolated allergy to clavulanic acid is rarely reported. We aimed to review data from our large regional Allergy centre of patients with possible or likely clavulanic acid allergy, identified during routine penicillin allergy investigation procedures.

**Method:** Retrospective review of case notes identified 11 cases with isolated co-amoxiclav allergy, two of which had no testing and therefore excluded from further analysis. All cases were evaluated as per BSACI penicillin allergy investigation guidelines and testing included the skin prick (SPT) and intradermal tests (IDTs).

**Results:** Of the nine cases identified eight were female and one was male. Age range was 17–72 years with mean age 51.6 years. Clinically, immediate hypersensitivity reactions were documented in two cases, both in the context of perioperative anaphylaxis. In the remaining seven cases, the history was not clear: penicillin allergy label during childhood in five cases and immediate rash only in two cases. SPTs to co-amoxiclav were negative in all cases, IDTs to co-amoxiclav were positive (immediate response) in the three cases. Remaining six cases had positive delayed IDT to co-amoxiclav (vague clinical history of penicillin allergy). Of these, four had negative penicillin challenge, one is awaiting challenge and one patient refused further investigations.

Specifically, clavulanic acid skin testing was performed in only one case (immediate IDT positive).

**Conclusions:** Immediate positive IDTs to co-amoxiclav correlated well with clinical history. We found, clavulanic acid allergy was most commonly diagnosed due to a delayed IDT (occurring 8–16 h later and lasting up to 48 h), resulting in the recommendation of clavulanic acid and co-amoxiclav avoidance. This diagnosis did not affect the outcome of penicillin allergy delabelling.

## A007 | Drug allergy diagnosis: Does ethnicity limit access?

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**Objectives:** Given the unmet need for allergy care it is likely that access to services for drug allergy diagnosis is also compromised by ethnicity. This audit aims to evaluate whether ethnicity is a barrier to obtaining diagnostic drug allergy testing in the Adult Allergy service at UHL.

**Method:** In this retrospective audit, we conducted a cross-sectional analysis comparing the ethnicity and demographics of patients undergoing drug allergy testing between April 2018 and March 2021. We analysed two groups: patients referred following suspected perioperative anaphylaxis (PoA) incidents (Group 1) and those referred by their general practitioners (GPs) (Group 2).

**Results:** We reviewed 165 patients investigated within the given period and included 37 patients (26 female, age 57 ± 16) in Group 1 and 128 patients (90 female, age 52 ± 17) in Group 2. Within Group 2, specific drug allergies were categorized as follows: 79 for antibiotic, 14 for non-steroidal anti-inflammatory drugs, 21 for local anaesthetic, 8 for steroid, three for vaccines and three for other drug testing. Among all patients tested for drug allergy, the ethnicity of 139 patients was British, 14 Indian, 2 Pakistani, 1 Bangladeshi, 1 Chinese and 8 patients had other White ethnicity. There was a significant difference of ethnicity between groups ($p = 0.042$). The percentage of patients of British ethnicity was lower in Group 1 (75%, $n = 28$) compared with Group 2 (87%, $n = 111$). Mean total IgE level was significantly higher in Group 1 (475 ± 833 vs. 183 ± 507; $p = 0.011$).
**Conclusions:** The ethnicity of patients referred for investigation of PoA reflected the local population where the criteria for testing are entirely clinical. The minority ethnic community was less well represented in the day case drug challenge clinic. Clinicians must work to develop strategies to ensure horizontal and vertical equity in access to diagnostic drug allergy services for all.

## A008 | A single-centre retrospective review of hypersensitivity reactions to intravenous iron preparations

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**Objectives:** Hypersensitivity reactions (HSRs) to intravenous iron preparations (IVIPs) are rare. The majority presumably occur via non-IgE-mediated mechanisms. Skin tests are rarely positive. We review a large cohort of patients with HSR to IVIPs.
**Method:** A retrospective review of patients at Guys and St Thomas' hospital allergy service between 2017 and 2023 was undertaken. Data on demographics, IVIPs, infusion duration, reaction severity, skin test results and outcome of drug provocation test (DPT) were analysed.
**Results:** Of 22 patients, 13 patients reacted either during first or second dose of IVIP. Most common reaction was to ferric carboxymaltose ($n = 16$). Majority suffered immediate reactions during infusion ($n = 19$), classed according to Ring and Messmer as mild ($n = 7$), moderate ($n = 8$) or severe ($n = 4$). Non-immediate reactions were mild ($n = 2$) or moderate ($n = 1$). In total, 16 patients underwent skin prick (SPT) and intradermal tests (IDT); both negative to index IVIP in 14 and to alternate IVIP in two patients.
DPT to index drug was tolerated in 15 patients, of which 8 had moderate or severe HSR, while seven underwent successful DPT to alternate IVIP, of which four had moderate or severe HSR. Average duration of infusion (ADI in minutes) during reaction ($n = 16$) was 36 versus 57 during DPT, 13 of which were to index IVIP. In those with moderate or severe HSR ($n = 6$), ADI was 35 during reaction versus 56 during DPT.
**Conclusions:** This is the largest review to date where both SPT and IDT results are available. These were negative even in those with clinical features of anaphylaxis which supports a non-IgE-mediated HSR mechanism.
Tolerance to index IVIP in moderate and severe reactions in eight patients adds to emerging evidence that culprit IVIP can be tolerated in this subgroup. Furthermore, ADI of an hour was tolerated during DPT in these patients against 3 h in literature to date.

## A009 | Diagnostic certainty in perioperative anaphylaxis

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**Objectives:** The investigation of suspected perioperative anaphylaxis relies on high-quality referral information combined with in vitro and in vivo testing. Deficiencies in either of these areas can lead to harmful diagnostic uncertainty. We describe here the certainty of the allergy diagnosis among 300 patients referred to the Leeds Perioperative Allergy Service between 2017 and 2022.
**Method:** For each patient, the primary diagnosis was recorded with an associated score for the certainty of this diagnosis. We used a 5-point scoring system, with a score of 1 for each of the following: (1) close temporal relationship between the causal drug(s) and the reaction (2) ≥2 clinical features of anaphylaxis (3) positive skin testing (4) raised serum mast cell tryptase (5) alternative diagnosis excluded.
**Results:** Of 300 patients, 25 did not attend clinic and it was concluded that there was no evidence of anaesthetic anaphylaxis for a further 103. Among 172 diagnosed with perioperative anaphylaxis, the most common culprits were antibiotics (62) and neuromuscular blocking agents (50). 20 patients had a diagnosis of 'anaphylaxis of unknown cause'. 68 patients had a high certainty diagnosis (score = 5), with the remaining 104 scoring 4 or less. 32 patients were advised to avoid multiple drugs due to uncertainty about the causal drug. Deficiencies in referral information contributed to low diagnostic certainty; 19 patients lacked clear documentation, and 22 had no mast cell tryptase sampling.
**Conclusions:** There are multiple barriers to the investigation of perioperative anaphylaxis, leading to diagnostic uncertainty for many patients. This can result in the unnecessary avoidance of multiple drugs and avoidance of future surgery because of patient and healthcare provider anxiety. Improvements to the referral pathway, expansion in the range of in vitro tests and greater provision of drug provocation testing are all required to improve diagnostic certainty and patient safety.

## A010 | Recreational drug abuse: Allergy mimics in peri-operative anaphylaxis assessment

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**Objectives:** Investigation of suspected peri-operative anaphylaxis can be challenging as some clinical features of anaphylaxis may be mimicked by other complications of anaesthesia or drug pharmacology. A detailed history and thorough assessment is therefore necessary in order to confirm or exclude allergic causes.

**Method:** We present a case of a 62-year-old man referred to Allergy clinic with suspected anaphylaxis during a partial parotidectomy operation. Patient developed refractory hypotension minutes after induction of anaesthesia with remifentanil, propofol, mivacurium, ondansetron and dexamethasone. Serial mast cell tryptase at 1, 4 h and baseline were normal. There was no associated urticaria or angioedema.

Skin prick and intradermal testing to propofol, remifentanil, latex, chlorhexidine, ondansetron and dexamethasone were negative. There was mild positive intradermal to cistracurium with negative tests to other neuromuscular blockers including mivacurium. Specific IgEs to pholcodine, suxamethonium, latex and chlorhexidine were all negative. Precautionary advice was given to avoid cistracurium, mivacurium and atracurium.

Patient subsequently underwent second attempted parotidectomy operation with remifentanil and propofol. This resulted in immediate cardiac arrest with return of circulation after two cycles of CPR. Mast cell tryptase at 3 and 24 h were normal. Cardiology investigations with echocardiogram and 24 h tape were unremarkable. Patient was re-investigated in the Allergy clinic with negative repeat skin tests to anaesthetic agents. Patient later disclosed 30-year history of daily amphetamine and ectasy use. Urine toxicology tests returned positive for amphetamine and MDMA (ectasy).

**Results:** Amphetamines are indirect sympathetic amines with strong neurostimulant effects. Chronic exposure to exogenous amphetamines results in depletion of endogenous catecholamine reserve. This can contribute to a blunted sympathetic response resulting in refractory hypotension and cardiovascular collapse during anaesthesia.

**Conclusions:** Chronic recreational drug abuse can result in exaggerated response to anaesthetic agents. This case highlights importance of a thorough peri-operative anaphylaxis assessment in identifying allergy mimics.

## A011 | An audit of clinical practice and documentation of childhood penicillin allergy testing undertaken in the Adult Allergy Service in a 12-month period

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**Objectives:** Penicillin is the most common, yet incorrectly reported, drug allergy. Spurious penicillin allergy labelling is associated with poor health outcomes, increased costs and contributes to antimicrobial resistance. Recent guidelines support the identification of low-risk patients, often incorrectly labelled as penicillin allergic in childhood, for direct provocation testing by non-allergists. To improve our clinical practice and service pathway, we sought to determine the following: (i) the number of patients investigated for childhood penicillin allergy, (ii) the type of testing undertaken and (iii) the documentation of allergy status in electronic health records.

**Method:** Between 1st March 2021 and 31st March 2022, a retrospective review of electronic health records in hospital (Cerner) and primary care (Summary Care Records) was undertaken for patients investigated for childhood penicillin allergy.

**Results:** 19/59 patients were referred with suspected childhood allergy to Amoxicillin ($n = 3$), Penicillin V ($n = 3$) and Flucloxacillin ($n = 2$). 4/19 patients had direct, oral provocation testing in two steps ($n = 2$), three steps ($n = 1$) and four steps ($n = 1$). 15/19 patients had skin prick and intradermal testing to a panel of six ($n = 13$), five ($n = 1$) and four ($n = 1$) penicillins before undergoing a three-step oral provocation test. 3/15 patients had a prolonged penicillin course ranging from 3 to 7 days. Amoxicillin was most commonly used for provocation ($n = 18$). One patient had an equivocal result following provocation and was advised to avoid penicillins until further testing. 18/19 patients tested negative, yet 6/18 patients remained 'allergic to penicillin' on hospital coding and 14/18 on primary care coding. Coding descriptors included 'penicillin allergy', 'adverse reaction' and 'sensitivity' to penicillin.

**Conclusions:** Minor variations in childhood penicillin allergy testing were identified across the service. Penicillin allergy was inconsistently delabelled from hospital and primary care records. Improved documentation and communication within and between services is required. Findings will inform a new low-risk penicillin allergy testing pathway.

## A012 | Monitoring of immunoglobulin treatment compliance of patients with an inborn error of immunity during the pandemic

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**Objectives:** During the coronavirus 2019 (COVID-19) pandemic, significant challenges were encountered in the management of patients with chronic diseases. This study aims to evaluate the effects of the pandemic on follow-up and adherence to treatment in patients receiving immunoglobulin replacement therapy.

**Method:** Changes in the treatment modalities of patients who received immunoglobulin replacement therapy between March 2020 and September 2021 were examined. An online message line was established with our patients under the control of nurses and doctors, and the rate of using this communication system was recorded.

**Results:** A total of 169 patients, 93 male and 76 female were included in the study. Of the patients, 124 (73.4%) were receiving IVIG, and 45 (26.6%) were on SCIG treatment. Although all patients in the subcutaneous treatment group continued the treatments regularly, this rate was 80.6% in the IVIG group. Patients who received subcutaneous treatment took a long break from their hospital controls, although they applied their treatments properly at home. Routine immunoglobulin trough values were able to be measured in only 17 (37.7%) of patients who were on SCIG.

In the presence of any symptoms, the rate of contacting our nurse or doctor team using the online message line was 100% in SCIG patients, while 48.3% in IVIG patients.

**Conclusions:** During the pandemic, the immunoglobulin treatment method should be individualized according to patient characteristics and expectations. Communication with telehealth services has become a critical monitoring method for patients with chronic disorders.

## A013 | Cutaneous small-vessel vasculitis due to amoxicillin hypersensitivity

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**Objectives:** *Background*: Cutaneous small-vessel vasculitis (CSVV) is defined as inflammation of the small blood vessels with skin or other systemic manifestations due to infections, drugs or neoplasm. Although rare, β-lactam antibiotics are a known cause of CSVV. We describe a case due to amoxicillin hypersensitivity.

**Method:** *Case presentation*: This 24-year-old woman was treated for respiratory infection with oral amoxicillin. 2 weeks later, she woke with widespread maculopapular exanthema. Over the coming 3 days, the lesions evolved to become palpable purpuric papules affecting ~80% of body surface area and she was admitted to hospital. Blood results showed CRP 9.1 mg/L but other investigations, including full blood count, renal and hepatic function tests, coagulation screen, autoimmune screen, HIV and hepatitis serology, respiratory swab and urinalysis were normal. Skin biopsy revealed inflammatory infiltrate in small vessels.

She was treated with high dose oral corticosteroids. Her skin took 3 months on treatment to improve, following which she was investigated with intradermal skin tests (IDTs) to benzylpenicillin and amoxicillin. Delayed reading of IDTs at 48 h was positive to amoxicillin. She was diagnosed with CSVV attributable to amoxicillin hypersensitivity.

**Results and Discussion:** The causes of CSVV are multitudinous, but specialist allergist input may be required to help confirm a drug-induced aetiology. Clinical findings may vary so skin biopsy is essential to confirm the diagnosis. Vasculitis may have systemic manifestations, such as pulmonary or renal involvement and can be life-threatening. As a result, when CSVV is confirmed due to a β-lactam antibiotic, the entire class of β-lactams is usually prohibited.

**Conclusions:** The assessment of CSVV requires a multidisciplinary approach and specialist allergist input is necessary for the investigation of drug-induced causes. IDTs may yield a diagnosis, which is informative in directing future antibiotic choice. Of drug causes, β-lactam antibiotics should be considered a probable culprit.

## A014 | High patient compliance and field-sting efficacy despite reactions during venom immunotherapy

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**Objectives:** Correct choice of patient for insect venom immunotherapy (VIT) prevents negative outcomes such as adverse reactions, non-compliance or death due to anaphylaxis on further exposure to field stings. We audited our VIT practice with reference to BSACI standards including uptake on BRIT Registry.

**Method:** 25 random patients from current pool audited against four standards. *Standard 1*: Patients must have experienced systemic reaction (SR); *Standard 2*: Positive venom-specific IgE and mast cell tryptase level pre-VIT (100%); *Standard 3*: Written emergency management plan, provision and adrenaline auto-injector trained (100%); *Standard 4*: Documentation of reactions and outcome of field stings during immunotherapy (100%).

All patients provided with documentation regarding BRIT Registry.

**Results:** Fourteen males and 11 females (age mean ± SD 60.24 ± 9.87 years) underwent VIT (15 wasp, 10 bee) received total of 678 injections.

**Standard 1**–100% of patients experienced SRs. Four patients (16%) experienced non-anaphylactic SRs (≤Grade 3) but received VIT after risk-stratification (beekeeper, working outdoors, lives far from hospital).

**Standard 2**–100% of patients had detectable specific IgE (wasp or bee) [one patient required skin tests to venoms] while two patients (8%) did not have pre-VIT tryptase level (92% fulfilled).

**Standard 3**–76% had emergency management plan and trained with auto-injector use (24% no documented plan but had access and trained with auto-injectors).

**Standard 4**–100% documentation of VIT reactions and field stings with 16 reactions (2%) (one Grade 4) and 7 field stings (none required hospitalisation or adrenaline). All patients successfully continued VIT.

Two patients remained on ACE-inhibitors without any problems. 14 patients (56%) had provided consent for their details to be on the BRIT Registry.

**Conclusions:** Reactions during VIT did not lower compliance and the treatment remains highly effective in preventing anaphylaxis to further field stings. Further surveys are required to understand the low level of patient engagement towards the BRIT Registry.

### A015 | Implementation of the REMA score into routine NHS practice to identify clonal mast cell disorders in a cohort of Hymenoptera venom anaphylaxis patients

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**Objectives:** Clonal mast cell disorders (cMCD) are a significant risk factor associated with very severe Hymenoptera venom anaphylaxis. Among this group venom immunotherapy (VIT) is often continued for longer than the usual 3 years, so diagnosis of a cMCD is essential.
**Method:** We reviewed the records of all patients initiating VIT at University Hospitals Plymouth NHS Trust during 2021 to compare the performance of the REMA score versus baseline mast cell tryptase (bMCT) alone in identifying cMCD in the context of routine NHS practice. All patients had REMA score calculated as part of their workup; those with REMA >2 were offered a bone marrow biopsy (BMB) to investigate cMCD; those who declined BMB had peripheral blood analysis performed for the D816V CKIT variant.
**Results:** Among the 83 patients who initiated VIT during 2021 a clonal mast cell disorder was identified in 8 (9.6%). These included five patients with monoclonal mast cell activation disorder (mMCAD), two with indolent systemic mastocytosis, and one with mastocytosis in the skin who declined a BMB (who was the only one of the eight who had a bMCT above the reference range at 12.5 ng/mL; reference range <11.4 ng/mL).
**Conclusions:** Reliance on bMCT alone to identify cMCD among patients with venom anaphylaxis fails to identify the majority of affected individuals. Use of the REMA score vastly improves the detection rate and is straightforward to implement into routine NHS practice.

### A016 | Prick-to-prick testing to fresh nuts in addition to specific IgE and skin tests using commercial solutions not helpful in patients with suspected nut allergy

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**Objectives:** Uncertainty regarding standardization and availability of commercial test solutions to foods led to adoption of prick-to-prick testing using fresh nuts (2018). The 'additional testing' resulted in staff constraints, patient anxiety of provocation of anaphylaxis and GMP regarding raw foods. A clinical-laboratory audit designed to address the safety and clinical utility of prick-to-prick testing using fresh nuts.
**Method:** Suspected nut allergy patients reviewed in the clinic between April 2018 and February 2020 identified. Patients with specific IgE blood tests, skin prick tests to both commercial solutions and prick-to-prick to raw nuts selected for the audit.
**Results:** 327 clinic letters identified 72 patients (mean age ± SD 40 ± 13.9 years) for the audit. 29 of 30 patients positive on specific IgE tests had similar results using commercial and prick-to-prick testing (97% concordance). One patient who reacted to chicken korma and seeded bread negative on commercial solutions was positive to almond (4 mm), hazelnut (5 mm), peanut (2 mm) but subsequently identified as being positive to Ara h 2 and Cor a 1 recombinant allergens. Ara h 8/9 positive patients ($n = 3$ each) had positive skin tests to both commercial and raw nuts (peanut, walnut, almond, hazelnut) including pollens in those tested, classical of oral allergy syndrome.
Only 2 of 42 patients (5%) negative on specific IgE blood tests and skin tests using commercial solutions were positive with raw nuts. However, results were below positive threshold (weal/flare responses 2–3 mm) and self-challenge to nuts were suggested. Patients did not subsequently attend follow-up appointments.
No safety concerns with skin testing against raw nuts (i.e. no immediate/delayed systemic reactions). Strong responses to tree/grass pollens frequently seen in those positive on prick-to-prick against raw nuts.
**Conclusions:** Additional prick-to-prick testing using raw nuts does not add any further value to specific IgE against whole nuts/recombinant allergens and skin tests using commercial solutions.

### A017 | Poor allergy knowledge in the acute inpatient setting delays provision of required nutrition support in food allergy patients

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**Objectives:** An increase in reported food allergy in adults is resulting in more inpatients presenting with a food allergy label. When the patient requires support to meet their nutritional requirements, reduced knowledge around food allergy and lack of allergy specialists in the acute setting can cause a delay in starting any required nutrition support, consequently extending recovery time and hospital stay. This work assessed the extent of this issue in an acute hospital setting.
**Method:** Details of inpatients with reported food allergy seen for nutrition support within the previous 12 months were collected retrospectively by members of Salford Care Organisation hospital dietetic team. The authors independently reviewed these patient's electronic records (EPR) to ensure they met the inclusion criteria of not receiving nutrition support products on admission and to extract required data. Variables of interest were age; gender; symptoms on admission; relevant medical history; reported food allergies and whether Dr diagnosed; any food specific IgE and whether measured during

admission; length of stay; route of nutrition support; delay initiating support due to food allergy including length and reason for delay.

**Results:** Seven out of eight identified patients met inclusion criteria. Reported food allergies were IgE mediated and/or non-IgE mediated and were a mix of Dr diagnosed and self-reported. Length of stay of these patients ranged between 10 and 105 days (Mean 46.6 days). All seven experienced delay in initiation of nutritional support (range 2–23 days (mean 15.6 days; 44% of mean total length of stay). Main reason for delay was clinician anxiety about possible reactions to nutrition support products and lack of allergy knowledge to aid decision making around appropriate 'safe' products.

**Conclusions:** To ensure patients with food allergies receive required nutrition support in the acute hospital setting, clinical staff should be assisted by appropriate policies and/or quick reference guides alongside relevant training.

### A018 | Two cases of duck egg allergy in adult patients without hen's egg allergy

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**Objectives:** *Background*: Eggs are known to cause hypersensitivity reactions commonly in children. Hen's eggs are a key elicitor of egg allergy compared to other avian eggs. Duck eggs are different from hen's egg in physiochemical nature. We report two cases of duck egg allergy without accompanying hen's egg allergy.

**Method:** *Case Presentation*: 37-year-old male with a background of eczema, presented with an episode of anaphylaxis comprised of urticaria, eyelid swelling, throat constriction and asthma attack immediately after ingestion of duck's egg and barley malt vinegar. He has tolerated hen's eggs since then. Prick-to-prick testing was strongly positive to duck egg yolk (raw) 10 mm, duck egg white (raw) 15 mm and negative for barley and vinegar.

51-year-old male described two episodes of throat discomfort and gastrointestinal symptoms (cramping abdominal pain and diarrhoea) after consuming duck egg in the form of an omelette and as an ingredient in Welsh teacake. Uvula swelling was noted on second occasion. He has tolerated hen's and quail's eggs and duck meat without allergic symptoms since these reactions. Prick-to-prick testing was strongly positive to duck egg white (raw) 14 mm and duck egg yolk (raw) 7 mm.

**Results and Discussion:** Isolated duck egg allergy is uncommon. There are few case reports of duck egg allergy without hen's egg allergy. Previous case reports have utilised immunoblot techniques and have demonstrated that ovalbumin and lysozyme could be the responsible proteins for sensitisation in patients with duck egg allergy. It has been suggested that the responsible antigens in these proteins may be specific to Anseriformes (ducks and geese) and are not found in the eggs of Galliformes (hens).

**Conclusions:** We report two cases of duck egg allergy in adult patients without hen's egg allergy. The results of skin testing in both cases confirmed sensitisation to duck egg.

### A019 | Pollen food syndrome and elevated skin prick testing: When to challenge

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**Objectives:** Peanut allergy is one of the most common diagnosis in food allergy. Its diagnosis is relatively straight forward. The impact of this diagnosis is lifelong and a careful approach to the diagnosis must be made.

**Method:** We present the case of a 27-year-old woman who upon eating peanut butter immediately developed lower lip swelling and pruritus. There was no associated rash, respiratory or cardiovascular symptoms. She took antihistamines with full resolution of symptoms within minutes. She did not notice symptoms with any other tree nuts, fruits or vegetables.

Skin prick testing to the peanut solution was 13 mm and fresh was 14 mm (histamine 6 mm, saline 0 mm). She was sensitised to grass pollen (4 mm) and silver birch (14 mm).

Her past medical history included eczema and hay fever.

The impact of a label of peanut allergy in our patient was significant to her quality of life as it is an important part of her culture and daily food consumption. This was a food that reminded her of family events, or reunions and of home. She accepted the risk of a challenge as she did not want to spend her life avoiding peanut if there was even the slightest chance she was not allergic.

**Results:** Peanut rAra h Pr-10 was the most prominent component (60.80 kUA/L). Direct Provocation Test (DPT) was negative.

**Conclusions:** The current EEACI Guidelines suggest that a SPT ≥8 mm or sIgE ≥15 KU/L to peanut is highly predictive of clinical allergy. That is, the magnitude of a SPT or sIgE relates to the probability of clinical allergy, with eczema being a significant risk factor for primary nut allergy. This case suggests that SPT can be high due to pollen food syndrome (PFS) and a thorough history and risk assessment is essential before labelling a patient with a lifelong allergy.

### A020 | A retrospective analysis of patients sensitised to Pru p 3 from a London allergy clinic

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**Objectives:** Lipid Transfer Protein (LTP) allergy poses diagnostic challenges due to the lack of a definitive test. Pru p 3 is considered a reliable marker of sensitisation to LTP, however it does not allow discrimination between allergy and sensitisation alone. This study aims to analyse patients sensitised to Pru p 3 and compare the characteristics of those diagnosed with LTP allergy and those without.
**Method:** A retrospective analysis was conducted on 184 adult patients referred to the Allergy Unit at the Royal Brompton & Harefield NHS Foundation Trust in London. Patients with positive sIgE test for Pru p 3 between 2012 and 2022 were included. Sensitisations to food and aeroallergens were assessed using SPT, prick-by-prick tests and sIgE measurements.
**Results:** 111 (60.3%) patients had LTP allergy, while 73 (39.7%) had an alternative diagnosis. LTP allergy patients were typically young with a history of A&E visits ($p = 0.007$). Allergic reactions commonly involved urticaria ($p = 0.000$), angioedema ($p = 0.002$) and laryngeal symptoms ($p = 0.024$), often with cofactors ($p = 0.000$). LTP allergy patients had lower prevalence of allergic rhinitis, asthma and mouth/throat itching ($p = 0.001$). Trigger foods included tomato puree/soup ($p < 0.001$), mustard ($p = 0.013$), peach ($p = 0.017$), pasta dish ($p = 0.022$) and composite foods. Sensitisation to SPT peach ($p < 0.001$), Mal d 3 ($p = 0.036$), Cor a 8 ($p = 0.015$) and Ara h 9 ($p < 0.001$) was more frequent in LTP allergy patients, while Jug r 3 was not significant. Mugwort sensitization was more common ($p = 0.006$), while birch and grass pollen sensitisation was less likely. Severity of reactions did not differ between LTP allergy patients with and without birch pollen sensitisation.
**Conclusions:** This study confirms the complex but defined clinical presentation of LTP allergy. Additional LTP markers (Cor a 8, Ara h 9) can improve diagnostic accuracy when implicated foods are involved. Birch pollen sensitisation does not protect against severe reactions in LTP allergy patients in this population.

## A021 | Anaphylaxis to cardamom: First-reported UK case

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**Objectives:** *Background*: Cardamom is a spice made from the seed pods of the cardamom plant, from the Zingiberaceae family. Cardamom is used as flavourings and cooking spices in both food and drink. There are only two worldwide reported cases of cardamom allergy: one case of allergic contact dermatitis to cardamom (Sweden, 1975) and one case of anaphylaxis to cardamom (Germany, 2010).
**Method:** *Case presentation*: A 69-year-old female reported a reaction after eating a cinnamon and cardamom bun (Ingredients; wheat flour, milk, butter, yeast, sugar, salt, cinnamon and cardamom). Twenty minutes after consumption, she reported generalised urticaria, laboured breathing, vomiting, diarrhoea, confusion and was pre-syncopal. Previously, she recalled having eaten curry with cardamom and developed itchiness across the body within 30 min without systemic features. She has tolerated again all the other ingredients in the bun, including cinnamon, but avoided cardamom entirely.
Specific IgE testing for wheat omega-5-gliadin and the common pan-allergens (PR-10, LTP, Profilin) were negative, and serum baseline tryptase was also not elevated (7.81 µg/L). Cardamom-specific IgE was also negative (0.02KUA/L). She then underwent prick-to-prick testing to cardamom pods and bun (both negative), followed by graded oral provocation test to the same cardamom bun. After eating the last dose (53 g), she developed urticaria and itchiness to her palms of hands, arms and back, then became unresponsive and hypotensive—which was treated successfully with IM adrenaline. An acute 2-h post reaction tryptase was elevated at 12 µg/L.
**Results and Discussion:** Cardamom should be considered as a relevant (potentially hidden) food allergen capable of causing anaphylaxis. Allergists should be aware that skin prick testing and SIgE assays are likely not sensitive in the diagnostic work-up, and progression to cautious provocation testing may be necessary.
**Conclusions:** To our knowledge, we describe the first UK case of IgE-mediated allergy to cardamom, confirmed by food provocation test—and only the second case worldwide.

## A022 | Adult-onset cow's milk allergy: Rare but severe

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**Objectives:** Adult-onset cow's milk allergy (CMA) is less common than childhood CMA. The contribution of co-factors complicates its diagnosis and management, resulting in a lack of standardised approaches for these patients. We conducted an audit to evaluate the patients referred to our adult allergy service for the investigation of CMA. We also reviewed our approach to investigation and the consequences of testing.
**Method:** In this retrospective audit, we reviewed 27 patients referred with a presumed diagnosis of adult-onset CMA between January 2019 and May 2022.
**Results:** The mean age of our patient cohort was 41 years (SD 13.04), 67% being female. Among these patients, 48% exhibited mild type 1 hypersensitivity symptoms, while 15% experienced severe systemic symptoms, including anaphylaxis. 30 per cent presented with predominantly gastrointestinal symptoms and 7% experienced a worsening of atopic dermatitis. 13 patients (48%) had intermittent symptoms, suggesting the involvement of co-factors. Two of these 13 patients reported exercise as a co-factor. 33 per cent of patients had history of unnecessary milk avoidance and subsequently developed primary CMA. Following risk assessment, 74% of patients were advised to completely avoid milk, and a similar percentage were prescribed adrenaline auto-injectors. Two patients who exhibited

tolerance to milk but were allergic to whey, were advised to avoid whey protein. The majority (92%) were also reviewed by specialist dietician.

**Conclusions:** Adult-onset CMA is a heterogeneous condition requiring an individualised approach to management. In some patients, unnecessary cow's milk avoidance may predispose them to developing true food allergy in the future. More data is urgently required to confirm this association.

### A023 | Folic acid-induced anaphylaxis: Two case reports with one successful oral provocation test

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**Objectives:** *Background*: Folic acid (FA) is an essential B vitamin, critical for rapid cell division (pregnancy, infancy, erythropoiesis). It is not synthesised endogenously. Deficiency is common. We present two FA-induced anaphylaxis cases; one tolerated graded oral provocation testing (OPT).

**Method:** *Case presentation*: A 66-year-old hypertensive female was referred with immediate throat itch, generalised urticaria, facial angioedema, breathing difficulty and dizziness after first FA dose (5 mg). Loratadine was taken and paramedics administered three intramuscular adrenaline doses followed by in-hospital monitoring.

Skin prick tests (SPT) to FA (crushed tablet in water for injection (WFI); 5 mg/mL), calcium folinate (crushed tablet in WFI; 15 mg/5 mL), Lexpec (0.5 mg/mL), and Cernevit (containing 414 µg FA) were negative. Immediate intradermal dilutions (1/10, 1/100, 1/1000) were positive. With consent, a graded OPT was performed with calcium folinate (15 mg). Urticaria developed 30 min after ½ dose (7.5 mg), treated with cetirizine (20 mg) and intravenous hydrocortisone (200 mg). Repeat OPT, 2 weeks later confirmed ¼ dose (3.75 mg) was tolerated and continued without adverse effects, with normalisation of folate levels (>24 µg/L).

A 55-year-old hypertensive male was referred with generalised urticaria, angioedema (lip, tongue), wheeze, difficulty breathing/swallowing, desaturation (90% on air) and tachycardia (140 bpm) 40 min after first FA dose. He was managed by paramedics with oxygen, intramuscular adrenaline, intravenous hydrocortisone (200 mg) and chlorphenamine (10 mg). SPT were positive to FA. OPT was not indicated (repeat folate levels normal). In both patients, tryptase samples were unavailable.

Both patients were prescribed cetirizine and an adrenaline autoinjector for emergency.

**Results and Discussion**

We show FA-anaphylaxis in two subjects who tolerated dietary FA. FA allergy to fortified foods is rare, but reports suggest higher synthetic folate monoglutamate bioavailability than natural folate polyglutamate may contribute.

**Conclusions:** Although rare, FA allergy should be suspected in unexplained anaphylaxis or urticaria, while on supplementation. OPT is gold standard diagnostically. After positive OPT, desensitisation may be attempted to allow safe reintroduction.

### A024 | First case report of Egusi (white-melon) seed allergy in adults

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**Objectives:** *Background*: Allergy to seeds is becoming increasingly prevalent; among them sesame seed allergy is the most common. There are case reports of poppy, sunflower and pumpkin seed allergies; however, only one reported case of white-melon seed allergy to date in the paediatric population.

**Method:** *Case presentation*: A 23-year-old female presented after reaction to home-made African melon seed soup. An hour after consumption, she developed generalised hives with dizziness and syncope. At the hospital she collapsed again and subsequently developed gastrointestinal symptoms. She was treated appropriately and discharged.

The ingredients of the soup were grilled chicken, smoked catfish fillet, beef, smoked fish stock, palm oil, Knorr chicken seasoning, ground crayfish, salt, chilli pepper, curry powder, bitter leaf, ground white-melon seeds; most she had tolerated since, and the remaining were negative on subsequent skin prick to prick testing except for crayfish (3–4 mm) and melon seed (10 mm). While sesame seed was negative on skin testing, IgE to it, and sunflower seed was positive—neither of which she had reacted to previously. She successfully underwent challenges to sesame and crayfish.

A diagnosis of melon seed allergy was made, with possible cross-reactivity to other seeds. Strict avoidance of all seeds was advised apart from sesame.

**Results and Discussion:** Egusi (Citrullus mucospermus) or white-seed melon/egusi watermelon are seeds within the Cucurbitaceae family which are closely related to watermelon. The flesh is bitter but the dried and ground seeds are commonly used in West African cuisines, particularly to thicken soups. There is no data on relevant allergens or cross-reactivity patterns with other seeds. However, cross-reactivity has been described between members of the Cucurbitaceae family such as pumpkin, watermelon, cucumber and courgette.

**Conclusions:** Egusi seed is a very rare allergen but a common ingredient in West African cuisines and may be the culprit in reactions to dishes within this cuisine.

## A026 | The association between allergy and mental health disorders

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**Objectives:** Allergic disorders affect between 10% and 40% of the population. However, the associated disease burden is not well understood.

**Method:** We undertook a population-based retrospective matched open cohort study using participating UK general practices from the IQVIA database between 1995 and 2022. Read codes were utilised to identify patients with allergic disorders (food/drug allergies, urticaria, allergic rhino-conjunctivitis and experience of anaphylaxis) who were matched (by age, sex, general practice and deprivation) to four control patients in the data set with no diagnoses of allergic disorders in their electronic health record. Cox regression analysis was used to calculate adjusted (age, sex, deprivation, smoking status, alcohol use, body mass index and exposure to eczema and asthma) hazard ratios (aHR) for the development of mental ill health (depression, anxiety, severe mental illness, eating disorders, obsessive compulsive disorder and self-harm) during follow up.

**Results:** 1,826,963 patients with allergic conditions were matched to 2,452,274 controls. During the follow-up period, 290,887 patients (incidence rate (IR) 27.2 per 1000 person-years) with allergic conditions developed mental ill health compared with the 208,006 (IR 18.1 per 1000 person-years) controls, translating to an adjusted HR of 1.49 (1.48–1.49). All individual analyses (when examining per mental health outcome) demonstrated a positive association, but notably, the risk of developing OCD was aHR 1.57 (95% CI 1.52–1.67).

**Conclusions:** Considering the prevalence of allergic disorders, a positive association of this magnitude translates into a substantial associated public mental health burden. It is therefore important to implement policies aimed at enhancing: (1) detection of mental ill health, (2) secondary and tertiary prevention interventions to reduce the burden of mental ill health in patients with allergic disorders and (3) clinical awareness of such associations and subsequent knowledge of management. Dual delivery of allergy and psychology services are needed to optimise the care of individuals with allergies.

## A027 | Assessment of patient selection for the telemedicine clinics

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**Objectives:** Assess the effect of pre-selection of patients for telemedicine clinics to determine whether this made a difference to patient outcomes.

**Method:**

- A retrospective analysis was done of 50 patients each from telemedicine clinics in four different adult allergy services in England ($n = 200$) from the start of August 2021 as part of a quality improvement project. Two centres used pre-determined selection criteria for patients allocated to telemedicine clinics and two centres did not for the data collection period. The data was analysed by the reason for referral, healthcare professional reviewing patients (consultant vs trainee), the outcome of telemedicine appointment and the number of follow-up visits needed.

**Results:**

- The type of referrals seen in telemedicine clinics at the different centres showed significant heterogeneity—one centre saw an equal distribution of referrals for adverse drug reactions (ADR) and non-ADR, one centre saw predominantly ADRs and the remaining centres saw predominantly non-ADR referrals.
- Vaccine-related reaction was commonest among ADR referrals, and urticaria and angioedema was commonest for non-ADR referrals. The use of pre-selection for telemedicine clinics resulted in a higher discharge rate at the first appointment (33%) compared to centres that saw unselected patients (17%) ($p < 0.001$). The primary reason for the patient's follow-up was to perform skin testing. Most referrals were seen by consultants (68%) compared to trainees (32%).

**Conclusions:**

- Pre-selection of patients for telemedicine clinics helps identify suitable patients that can potentially be discharged or require minimum follow-up appointment and improves the efficiency of these clinics. Telemedicine clinics also minimise the travelling time and expenses patients incur when attending appointments. It can specifically be helpful for elderly patients, patient's living far away and with travel barriers to improve access to allergy care.

### A028 | Non-response to omalizumab in patients with chronic spontaneous urticaria (CSU): A 10-year real-world UK study

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**Objectives:** Investigate factors influencing non-response in a large, real-world cohort of CSU patients treated with omalizumab.
**Method:** Data were retrospectively collected from electronic case notes of patients with CSU who commenced omalizumab between September 2010 and September 2020 at St. James University Hospital, Leeds. A total of 357 patients were identified. Demographics (age, gender, weight), clinical features (presence of angioedema, presence of systemic symptoms, baseline UAS7, previous immunosuppression, comorbidities) and laboratory results (IgE, tryptase, TPO, CRP) were compared. Patients were categorised into response, primary non-response, secondary non-response and relapse groups. Response was clinician defined or UAS7 <28 within 4 months of omalizumab treatment. Statistical analysis was performed using Stata software.
**Results:** Non-response was seen in 37% of patients, categorised into primary non-response (17%), secondary non-response (13%), and relapse (7%). Updosing proved beneficial in 48% of primary non-responders and 80% of secondary non-responders. Associated systemic symptoms were more common in patients with secondary non-response ($p = 0.003$) and UAS7 scores were higher in patients with secondary non-response ($p = 0.03$). Average time to secondary non-response was 17 months. Relapse occurred in 7% of patients, with a trend of higher comorbidity and metabolic comorbidity in this group. Average time to relapse was 9 months. Successful re-initiation of omalizumab was observed in 67% of relapsed patients, with significantly higher IgE values in the successful re-initiation group ($p = 0.03$).
**Conclusions:** Non-response was seen in 37% of patients, categorised into primary non-response (17%), secondary non-response (13%), and relapse (7%). Updosing overcame non-response in 48% of primary non-responders and 80% of secondary non-responders. There were no obvious predicting factors for primary or secondary non-response to omalizumab and further research is required.

### A029 | Animal dander allergen specific immunotherapy: Experience of a UK service

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**Objectives:** The prevalence of animal sensitisation has increased worldwide, with studies reporting global prevalence of 10%–20%. However, the evidence for animal dander allergen-specific immunotherapy (AIT) is relatively limited. We review patients treated within our service to assess the effectiveness and tolerability of animal dander AIT and the impact on symptomatic improvement and quality of life.
**Method:** Patients treated with animal dander allergen immunotherapy were identified from the centre database and case notes were reviewed, focusing on efficacy and tolerability.
**Results:** 11 patients were identified that had been treated with animal AIT between 2015 and 2022. All patients were treated with sublingual immunotherapy. There were six patients treated for dog dander, three for cat dander and two for horse dander. Five patients completed the immunotherapy, of which three were treated with cat dander and two with dog dander AIT. All those who completed AIT demonstrated a positive outcome with either significantly improved symptoms or complete desensitisation with negative challenge test. Three patients were lost to follow-up, one patient discontinued therapy due to pregnancy, and two patients discontinued due to intolerance of therapy.
**Conclusions:** There may be significant symptomatic benefits offered by animal dander AIT, which may be most beneficial in those who are unable to avoid exposure. Animal dander AIT is offered comparatively less than other inhalant allergens in our centre, which is similar across the United Kingdom. There are limited studies conducted in animal allergies compared with other aeroallergens, and further research is required to understand the benefits and cost-effectiveness of animal dander AIT.

### A030 | Corticosteroids: Dermatological allergen and treatment

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**Objectives:** Steroid allergies remain rare and unusual. We present a delayed hypersensitivity reaction to betamethasone 17 valerate with patch test cross-sensitivity to dexamethasone phosphate.
**Method:** A 23-year-old-female presented with nail plate loss on the left index finger and an erythematous, dry spreading rash on the webs and palms of her hands with a previous 4–5-day history of facial rash, which worsened upon exposure to epoxy. The patient had a history of atopic presentations and nail clippings were negative for infectious pathogens. Patch testing results demonstrated ++ epoxy mix, + betamethasone 17 valerate and + dexamethasone phosphate, the latter being a cross reaction. The patient was treated with topical Elocon (mometasone furoate 0.1%) and emollients. Nail splinting was also offered.
**Results:** This case demonstrates allergy to a group 3 corticosteroid (Baeck, 2011) with cross-sensitivity to a corticosteroid in the same group. Interestingly, the corticosteroid used in treatment, mometasone furoate, also belongs to group 3.
**Conclusions:** While molecular structure classifications may help in choosing alternative treatments, this case reiterates the importance in clinical practice of supporting these decisions with individualised investigation and treatment for corticosteroid allergy, without relying on groupings based on structure alone.

### A031 | Successful management of treatment resistant seasonal allergic rhinitis with omalizumab

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**Objectives:** Allergic rhinitis (AR) is a chronic inflammatory disease caused by inhaled allergens contacting the nasal mucosa, inducing an IgE-mediated inflammatory response. Selection of pharmacotherapy for patients is dependent on multiple factors, with symptom management a priority. Omalizumab has been proven effective and safe in treating seasonal AR by several randomised clinical trials. It has been shown to reduce nasal symptom scores, quality of life scores and use of rescue medications. [1–5].
**Method:** A 44-year-old female with poorly controlled seasonal allergic rhinoconjunctivitis to grass and tree pollen despite optimal medical therapy with quadruple dose antihistamines, montelukast, Dymista and olopatadine eye drops. During the winter months she had mild, well-controlled rhinitis to house dust mite. She was otherwise fit with no other medical history. Specific IgE testing demonstrated a strong sensitisation to grass and tree pollen. Despite a year of sublingual desensitisation immunotherapy to grass and tree pollen, she was symptomatic with marked rhinoconjunctivitis and reported losing her job. She was commenced on omalizumab (300 mg every 4 weeks for 4 months) during the hay fever season and continued sublingual immunotherapy in the autumn. She subsequently continued sublingual immunotherapy the following spring and summer. There was a 92% reduction in her visual analogue scale and 82% reduction in her symptom scores following omalizumab treatment. She was successfully able to return to full time employment.
**Results:** To our knowledge, this is the first-reported UK case of omalizumab use for treatment resistant allergic rhinitis. Omalizumab improved AR-specific symptom and quality of life scores. The benefits of omalizumab need to be evaluated in the context of access of therapy and cost effectiveness. [1–5].
**Conclusions:** Treatment of seasonal allergic rhinitis with omalizumab and could be considered in the management of patients, which has failed to be controlled with conventional treatments. [1–5].

### A032 | Duration and prevalence of respiratory symptoms in patients referred for asthma diagnostic testing

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**Objectives:** The objective of the study was to identify the length of time patients report asthma symptoms prior to asthma diagnostic testing and the prevalence of individual symptoms in those who are subsequently diagnosed with asthma.
**Method:** Adults (age >16 years) with a suspected asthma diagnosis, who were treatment naïve, were referred to the Rapid Access Diagnostics for Asthma (RADicA) study by GPs across Manchester. Over a series of visits, data were obtained on demographics, symptom type and duration followed by spirometry, bronchodilator reversibility, FeNO, peak flow variability, eosinophils and bronchial challenge before a trial of treatment with inhaled corticosteroids. Asthma diagnosis was then confirmed or refuted by an expert panel.
**Results:** Of the 110 participants (mean age 36 (SD- 11.95); 36.4% male), 68 (62%) received an asthma diagnosis. For the whole group, the median duration of symptom before undertaking asthma diagnostic tests was 24 months (range 1–660 months). Those whose symptoms started in adulthood, compared to the whole cohort, were more likely to present sooner, median 1 versus 2 years ($p = 0.04$). There was no difference in duration of symptoms between those diagnosed with asthma and those confirmed not asthma, median 12 vs. 36 months ($p = 0.29$). Wheeze and chest tightness were significantly more common in asthma compared with not asthma ($p = 0.007$ and 0.047, respectively). Asthma patients were also more likely to complain of more than one respiratory symptom ($p = 0.023$) and be unable to specify one predominant symptom ($p = 0.016$).
**Conclusions:** Patients experiencing symptoms suggestive of asthma often have symptoms for around 2 years before physicians are considering asthma diagnostic tests, resulting in potentially high levels of morbidity. Interestingly, if symptoms develop in adulthood diagnostic testing was considered sooner. Those experiencing wheeze and chest tightness were more likely to be diagnosed with asthma and perhaps testing should be considered earlier in such patients.
No funding to declare.

### A033 | Rapid desensitization to omalizumab in a patient with severe asthma

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**Objectives:** *Background*: Omalizumab, a humanized anti-IgE monoclonal antibody (mAb) that selectively binds to human IgE, is an add-on treatment option effective in the treatment of patients with severe allergic asthma and chronic idiopathic urticaria. Omalizumab carries a risk for anaphylaxis, with a reported incidence of 0.09%. We present a case of Omalizumab desensitization in a male asthmatic patient who developed an immediate hypersensitivity reaction (larynx oedema) after the first Omalizumab injection.
**Method:** *Case presentation*: A 52-years old male with severe asthma had a stridor, vocal changes and odynophagia within 5 min after the first subcutaneous injection of omalizumab 300 mg. The uvula

appeared oedematous and engorged. The patient was treated with intramuscular adrenaline, to which he responded quickly. After 4 weeks, the patient was admitted to hospital for omalizumab desensitization. Omalizumab prick test (concentration: 150 mg/mL) and intradermal test (concentration: 1.5 mg/mL) were negative. Intravenous access was obtained as a precaution and levocetirizine 5 mg and famotidine 20 mg by mouth administered 30 min before desensitization. A 7-step desensitization protocol was performed using sequential doses (mg) subcutaneously: 3,6,12,30,60,75 and 90, to a final cumulative dose of 275 mg over approximately 5 h. Five minutes after the last injection, the patient complained of a mild feeling of irritation in his throat. The oropharynx and uvula appeared normal. Adrenaline 0.5 mg was administered, within 1 h his symptoms relieved.

**Results and Discussion:** In our case, unexpectedly at the end of the omalizumab desensitization, the patient developed mild laryngeal symptoms. In the literature, we have found only one case who had only throat tightness after omalizumab and tolerated a 4-step omalizumab desensitization without any symptoms.

**Conclusions:** Omalizumab can be effectively administered by desensitization protocol to patients with a history of systemic reaction to omalizumab. In any allergic reaction during desensitization, the protocol may need to be revised.

## A034 | Nasal allergen challenge: Standardisation for house dust mite and silver birch allergen extracts

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**Objectives:** Nasal allergen challenge (NAC) is commonly used to investigate the effects of allergen exposure and assess treatment efficacy in allergic rhinitis. This study aims to establish dose-responses to NAC using silver birch (SB) pollen and house dust mite (HDM) allergen extracts in participants with allergic rhinitis, using licensed sublingual tablets.

**Method:** 16 volunteers with HDM induced allergic rhinitis and 15 volunteers with SB pollen induced allergic rhinitis were recruited. HDM-allergic volunteers underwent graded, up-dosing NAC with HDM allergen tablet extract in normal saline; SB-allergic volunteers also underwent graded-dose NAC with SB tablet extract. The allergen extracts used were Itulazax and Acarizax tablets (ALK-Abello, Denmark). Total nasal symptom score (TNSS, range 0–12) and peak nasal inspiratory flow (PNIF) were recorded during the NAC.

**Results:** The concentration of SB pollen that provoked a TNSS of at least 7/12 in the majority of patients was 1500 BU/mL (median), and for HDM, the provoking-dose 7 was also 1500 BU/mL. The mean percentage fall in PNIF associated with provoking dose 7 was 63.15% for SB allergen and 63.99% for HDM allergen. Nasal challenges using the identified 'provoking dose 7' for each allergen were performed on five non-atopic individuals to demonstrate the lack of irritant effect. The 'provoking dose 7' of HDM extract was tested in a subgroup of SB allergic, non-HDM allergic, volunteers and vice versa with the 'provoking dose 7' of SB extract, to demonstrate allergen specificity of responses.

**Conclusions:** This study successfully identified the dose of each allergen that typically produces a response of moderate severity (provoking dose 7) and demonstrated that the soluble allergen derived from the tablets is suitable for use in nasal allergen challenges with SB and HDM. The findings could then be used in future interventional and experimental studies investigating allergic rhinitis.

## A035 | Real-world adherence to grass SLIT and the impact of a dedicated clinic: Experience from a specialist allergy service in the UK

Veeresh Patil; Jemma Metcalf; Karen Jackson; Sophi kottackalouseph; Nasreen Khan; Leyla Pur; Anna Murphy

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**Objectives:** AIT (allergen immunotherapy) is the only disease modifying treatment for AR (allergic rhinitis). SLIT (Sublingual Immunotherapy) to aero-allergen is given over 3 years. Adherence is known to be one of the main barriers to successful outcome on symptom control. We describe adherence to grass SLIT using medicine possession ratio (MPR) data. We also look at the impact of a nurse lead telephone clinic on adherence.

**Method:** Data from all patients receiving grass SLIT over the last 10 years at a specialist centre was reviewed. MPR is calculated as the ratio of filled prescription doses over the number of expected doses. MPR information was collected through prescriptions of grass SLIT. Nurse lead remote adherence clinics were commenced January 2021. Patients on SLIT were contacted three times a year and were prompted about adherence to treatment. MPR were compared over the treatment period, between those who only had one course vs those needing more and also pre- and post-adherence clinic intervention.

**Results:** In total 21 courses between 2013 and February 2023 were started in 15 patients, 10 had a single course, four had two courses and one had three courses. Overall average MPR was 61%. It was the highest in the first year at 75% (Yr2-65%, Yr3-69%). Average MPR was higher in those with single course (80.4%) compared to those with multiple courses (59.9%). MPR improved with the introduction of adherence clinics from 62.3% to 72.7%.

**Conclusions:** Real world data shows an overall low adherence rate to SLIT. Findings suggest that higher adherence rates are likely to minimise the need for further courses. However, this needs further review with larger numbers including the clinical severity data. Nurse

lead remote adherence clinics can improve adherence, but longer follow-up data and cost effectiveness analysis of the intervention will be helpful in confirming this finding.

### A036 | Role of sublingual immunotherapy in management of patients with moderate to severe allergic rhinitis, 1-year study

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*Ain Shams University, Cairo, Egypt*

**Objectives:** Allergen immunotherapy (AIT) is one of the suggested treatments for various allergic diseases including allergic rhinitis (AR). It is thought to change the course of AR with prevention of new sensitization and asthma development. We aimed to assess efficacy of sublingual immunotherapy (SLIT) among adult Egyptian patients with AR.

**Method:** 60 adult patients with moderate to severe AR were randomly selected, 40 patients received SLIT (SLIT group) and 20 received placebo (Control group). History taking, CBC, Total IgE, skin prick test for common allergens were done initially while quality of life questionnaire (QoLQ), total nasal symptoms score (TNSS), total medication score (TMS), visual analogue scale score (VAS) were done at 0, 6 and 12 months duration, and allergen-specific IgE and nasal smear were done at baseline and after 1 year.

**Results:** Mean age of participants was 33 ± 11 years, 46% were males, mean absolute eosinophilic count was 0.47 ± 0.18 $10^3$/μL and mean Total IgE was 145 ± 30 IU/mL, Dermatophagoides Farinae was the commonest allergen with no significance between groups. QoLQ, TNSS, VAS and TMS showed significant reduction in SLIT group at 6 ms and 12 ms than control group ($p$ 0.01). Nasal eosinophilic count showed significant reduction among SLIT group ($p$ 0.012). Allergen-specific IgE showed significant elevation after 12 ms among SLIT group ($p$ value 0.01).

**Conclusions:** SLIT showed effectiveness regarding quality of life, nasal symptoms and reduction in nasal eosinophilic count.

### A037 | Dupilumab as an effective treatment for allergic fungal rhinosinusitis in female Egyptian patient

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**Objectives:** Chronic rhinosinusitis with nasal polyposis (CRSWNP) is a chronic inflammatory disease with significant impact on patients' quality of life. Allergic fungal rhinosinusitis (AFRS) is a subtype of CRSWNP which develops due to hypersensitivity to certain fungi and characterized by presence of eosinophil-rich mucus and clinically with high rate of recurrence.

**Method:** A 45-year-old, female patient with no previous medical condition of significance, started to develop bilateral nasal obstruction, persistent frontal headache, progressive anosmia, no history of asthma, drug allergy nor other allergic diseases were reported. The patient sought medical advice and after performing CT paranasal sinus and rhinoscopy she was diagnosed with CRSWNP. Sinus surgery and histopathological analysis of the removed polyps were done revealing colonization of Aspergillus Fumigatus followed by skin prick test which was positive to Aspergillus Fumagitus and diagnosis of AFRS was established. Initial absolute eosinophilic count was 250 cells/μL and total IgE was 330 IU/ML. Patient was on oral, intra-nasal steroids and systemic antifungal drugs for 8 weeks with improvement of general condition. Eight months later the patient reported recurrence of symptoms, interrupted sleepiness. Endoscopy and CT scan were done showing bilateral recurrence of nasal polyps with nasal polyp score (NPS) = 4. Patient was advised to start dupilumab 300 mg subcutaneous every 2 weeks. 12 weeks later the patient reported significant improvement of symptoms, NPS = 2 with no side effects reported.

**Results:** AFRS which is type 2 inflammatory mediated disorder rich in eosinophils, can theoretically benefit from dupilumab which is an interleukin-4 (IL-4) receptor antagonist that leads to decrease in markers of inflammation and as a result it could be a potential treatment for AFRS patients.

**Conclusions:** Dupilumab has a significant impact on AFRS with improvement of clinical symptoms and nasal polyp score.

### A038 | Human seminal plasma allergy: Case report

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**Objectives:** Semen allergy has the potential to have significant impact on quality of life by affecting sexual behaviour as well as affecting fertility. Although it is understood that semen can act as an allergen leading to type e IgE-dependent response to proteins contained in seminal plasma, prevalence remains unknown (1), and investigation of this diagnosis is not well documented.

**Method:** 43-year-old female presented with 5 year history of post coital symptoms including vaginal pain immediately post-sexual intercourse and dysuria 36 h later. Gynaecological examination following unprotected sexual intercourse revealed cervical lesions including erosions, swelling and mucosal peeling. Patient reported that taking oral cetirizine prior to sexual intercourse had helped to alleviate some of the symptoms following unprotected sexual intercourse. Equally, using barrier contraception completely eradicated the problem.

The patient was investigated for potential allergy to her partner's seminal fluid.

She was skin prick tested undiluted semen. She developed 5 mm flare with pseudopodium (no wheal). Intradermal skin test with semen 1:100 (Sample centrifuged for 15 min, diluted 2.5 mL + 2.5 mL saline to give neat dilution) = developed a wheal (>5 mm) and flare (15 mm).

This confirmed her allergy to her partner's semen. This confirms allergy to her husband's semen.

**Results:** She was skin prick tested undiluted semen. She developed 5 mm flare with pseudopodium (no wheal). Intradermal skin test with semen 1:100 (Sample centrifuged for 15 min, diluted 2.5 mL + 2.5 mL saline to give neat dilution) = developed a wheal (>5 mm) and flare (15 mm).

This confirmed her allergy to her partner's semen.

There was no evidence of delayed skin reaction following intradermal skin testing.

**Conclusions:** This patient was able to receive a diagnosis of semen allergy which could be used to inform further management of her symptoms, this type of testing and consideration of this diagnosis is not widespread.

## BASIC SCIENCE

### A039 | Novel ambient air sampler demonstrates superior detection of aeroallergens over traditional methods

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**Objectives:** As the prevalence of allergy- and asthma-related diseases intensifies, accurate measurement of environmental allergen exposure is increasingly important. Current methods rely on industrial air sampling pumps, personal devices (e.g. IOM samplers) or passive samplers (e.g. EDCs), all of which have limitations and disadvantages. Our aim was to develop a novel, user-friendly, high-throughput ambient air sampling device to be utilized in indoor environments for efficient and reproducible measurement of aeroallergens.

**Method:** A novel device and an IOM sampler were placed side-by-side in 10 domestic properties and run for 10 h. A novel device was placed next to an EDC and run for 7 days in 12 domestic properties. Filters from the IOMs and the novel devices, and the EDC were extracted, and allergens measured by multiplex assays for indoor and food allergens.

**Results:** The novel device detected indoor allergens from dust mite, cat, dog and mouse, with positivity rates of up to 100% (10/10). The IOM only detected allergens from cat and dog, with positivity rates of just 20% (2/10). Food allergens from milk (10/10), egg (8/10), peanut (7/10), cashew (6/10) and mustard (4/10) were detected by the novel device. The IOM only detected allergens from milk (3/10), egg (1/10) and mustard (1/10).

After 7 days of sampling, both the novel device and EDC detected allergens from dust mite, cat, dog, and mouse, but the novel device demonstrated an average positivity rate of 82% versus 38% for the EDC. The novel device detected food allergens from milk, egg, peanut, cashew, mustard, almond, sesame, hazelnut and walnut. Contrastingly, only allergens from milk, egg, peanut and walnut were detected by the EDC, all at lower positivity rates.

**Conclusions:** Here, we have demonstrated that our novel ambient air sampling device displays vastly superior capture of a wide range of aeroallergens over current methods.

### A040 | Evaluation of the ALEX2® Allergy Xplorer quantitative solid phase immunoassay among persons previously tested with the ISAC™ multiplex specific IgE allergen components test

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**Objectives:** The objective of this study was to evaluate the performance of Allergy Xplorer 2® (ALEX2®) (MacroArray Diagnostics, Wein, Austria) for the detection of specific IgE allergens (extracts and/or components) against common components and allergens present in the multiplex assay ISAC™ E112i assay (Thermo Fisher Scientific, Sweden).

**Method:** The study included 100 patients—80 allergy patients and 20 known negatives. Residual samples were measured on the ALEX2®. A total of 48 allergens were included covering a range of inhalants, foods and cross-reactive components. This study was approved by the Faculty of Health Sciences Research Ethics Committee at the University of Pretoria.

**Results:** The ALEX2® and ISAC™ methods were compared using Spearman correlations, Bland–Altman plots and kappa analyses. Correlation coefficients were significant for every comparison with 75% of r values >0.80. Although the Bland–Altman plots showed good method agreement, clustering for some allergens was observed around the 50 kUA/L mark—the maximum reading attainable on the ALEX2®. Kappa analyses showed good agreement between the methods, with 85% of K-values falling between the range of 0.61–0.80. Additionally, 50% of allergens displayed very good agreement between the methods, with K-values falling within the 0.81–1.00 range. No discrepancies were observed in the negative control group when ALEX2® was compared to ISAC™.

**Conclusions:** Our study findings demonstrate a good agreement between the ALEX2® and ISAC™ method for allergen specific IgE detection. ALEX2® offers additional benefits including simultaneous testing of 295 allergen components and extracts, a single run per patients and sample buffer including CCD inhibitor preventing potential false-positive results.

### A041 | Increased surface expression of basogranulin as a novel marker of basophil activation in food and drug allergy

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*[1]University of Southampton, Southampton, UK; [2]Bayero University, Kano, Nigeria; [3]University Hospital Southampton, Southampton, UK*

**Objectives:** Basophil activation tests may be of value in the diagnosis of IgE-mediated allergy with CD63 and CD203c commonly employed as markers. Basogranulin has been characterised as being unique to the basophil secretory granule, and it is released on basophil activation. We report that allergen-induced basophil degranulation is associated also with increased membrane expression of basogranulin as detected using flow cytometry.
**Method:** Peripheral blood was collected from cases of suspected drug allergy and food allergy and from healthy blood donors. Flow cytometry was performed with antibodies specific for basogranulin (BB1), CD63 and CD203c, with basophils gated as SSChighCCR3-postive cells. Expression of basogranulin, CD63 and CD203c was expressed in parallel following incubation of cells with selected drugs and foods, as well following experimental activation with antibody against FcεR1 or with the bacterial peptide f-met-leu-phe. Data was analysed using FlowJo software, and cell clusters were analysed using tSNE, FlowSOM and ClusterExplorer plugins.
**Results:** Increased expression of basogranulin, as well as of CD63 and CD203c was observed on basophils activated by drugs and foods, as well as with anti-FcεR1 and f-met-leu-phe as stimuli. For several cases basogranulin appeared a more sensitive marker of basophil activation than the other established markers. Though basogranulin is unique to basophil secretory granules, following basophil activation in mixed cell populations, it was observed on the membranes of other cell types possibly through adherence.
**Conclusions:** Measurement of increased cell membrane expression of basogranulin offers a novel means for assessing basophil activation in drug and food allergy and may provide sensitive means for determining specific allergic sensitivity.

## PAEDIATRIC CLINICAL

### A042 | A decade of egg allergy in Ireland

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**Objectives:** Food allergy along with all allergic disease is on the rise. Egg allergy is the second most common food allergy in children and a significant cause of anaphylaxis in the paediatric population. In recent years home introduction of egg protein via the egg ladder has emerged as a successful approach to managing IgE-mediated egg allergy in children. The aim of this study is to analyse and critique the use of the Egg ladder over the last 10 years in Ireland.
**Method:** Retrospective review of 497 patient charts from 2011 to 2021. Inclusion and exclusion criteria were applied. Data analysed using STATA 15.1.
**Results:** 497 charts were reviewed, 269 excluded ($N = 228$). 175 had a history of atopic dermatitis, 54 had milk allergy, 65 had peanut allergy with a further 38 with peanut sensitivity. 122 had a family history of atopy. Regarding symptoms at diagnosis 131 had urticaria, 48 had angioedema, and 38 had symptoms of anaphylaxis. Of the children with anaphylaxis 14 were treated with adrenaline at diagnosis. 202 children completed the ladder with the average length of time to achieve tolerance being 26.4 months. Two children had anaphylaxis during treatment, both due to accidental exposure. No children had anaphylaxis due to steps of the ladder. Concomitant peanut allergy resulted in 8 months longer to achieve tolerance and documented parental anxiety resulted in 17 months longer ($p < 0.05$). Each unit increase in Specific IgE resulted in 0.2 months longer on the ladder. Other variables such as biological sex, method of delivery, feeding history, atopic history, family history, other food allergies and symptoms at diagnosis were included in the analysis but did not reach significance.
**Conclusions:** The egg ladder is a safe and effective way of managing IgE-mediated egg allergy in children, even in those with anaphylaxis at diagnosis.

### A043 | Development of a regional paediatric egg allergy management pathway

Anna Rucker[1]; Cherry Alviani[2]; Penny Barnard[3]; Isabelle Brady[2]; Rachel Freer[4]; Lucy Kidman[5]
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**Objectives:** *Aims*: The BSACI 2021 guideline for the management of egg allergy recommends managing mild egg allergy in infants with education and gradual egg reintroduction at home, without prior allergy tests or referral to secondary care. Our aim was to create a regional guideline for both primary and secondary care clinicians managing children with egg allergy, in line with national guidance. This would support safe, timely and equitable access to care across Wessex. Visual decision support tools and patient information leaflets were included.

**Methods:** A multidisciplinary working party group was convened through the regional Wessex Allergy Network (WAN). It included clinicians from primary, secondary and tertiary care and dietetic colleagues. Using an established regional template for the management of paediatric conditions, which follows a visually appealing 'traffic light' system, a patient management pathway was created for both primary and secondary care clinicians. National guidance was followed. Supporting resources, including patient information leaflet and home egg reintroduction guidance, were also generated.

**Results:** The final guideline and supporting documents were reviewed by all members of WAN prior to their ratification. They have since been published on both the healthier Together and the PIER Network websites. These are extensively used regional platforms for the management of paediatric conditions by primary and secondary care, respectively. To further support guideline dissemination and awareness among primary care, it has been published in the weekly GP education e-mail in the Wessex region and we have recorded a podcast on management of egg allergy for the Wessex local medical committee.

**Conclusions:** Next steps.

The guideline has been very well received and we are aiming for wider dissemination outside the Wessex region. We are planning to review its impact over the following year and are in the process of developing further similar guidelines on other aspects of paediatric allergic disease.

## A044 | Is home introduction to baked egg a safe option in East London: A retrospective audit on reactions during baked egg challenges

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**Objectives:** Egg allergy commonly presents in infancy upon first exposure to egg during weaning. In the United Kingdom, egg allergy is present in 2% of 2-year-olds and most cases resolve by adulthood. Introduction of baked egg is important for promoting tolerance and increasing food choice. The recent British Society for Allergy and Clinical Immunology (BSACI) 2021 guidelines recommend that as anaphylaxis is rare in hospital baked egg challenges, children with mild–moderate reactions can have a home introduction (HI) instead. We evaluated our challenges to determine whether HI is a safe option for our patient population, as anecdotally children have experienced anaphylaxis during challenges.

**Method:** A retrospective audit was performed on paediatric baked egg challenges at The Royal London Hospital from March 2022 to March 2023. Data collection items included challenge outcome, skin prick testing (SPT), specific IgE, food allergy, atopy, family history and demographics. Analysis was undertaken in Excel, including a subgroup analysis on those who would meet the BSACI guidelines for HI.

**Results:** After excluding a patient who brought the wrong cake and another due to incomplete documentation, there were 77 patients who had a baked egg challenge. The majority (86%) of our patients also have eczema and 26% have asthma. Only three patients had anaphylaxis to egg previously. Most (71%) children passed the challenge. Of those that failed, 9% had anaphylaxis needing intramuscular adrenaline. Of those that met the BSACI guidelines for HI, 32% failed the challenge with one patient having anaphylaxis. This patient's previous reaction was hives and had a SPT of 6 mm.

**Conclusions:** The BSACI 2021 guidelines do not specify a maximum SPT value that is safe for HI. As a result, we propose an additional criterion that children with SPT of 3 mm or more should have a hospital baked egg challenge rather than home introduction.

## A045 | The safety of home baked egg introduction in IgE-mediated egg allergy and its influence on hospital challenge waiting times

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**Objectives:** The objectives of the study were to identify those children referred for a hospital-based baked egg challenge who would have been suitable for home introduction and assess the outcome and safety of those challenges.

**Method:** Children referred for baked egg challenge (Jan 2018–Dec 2020) were characterised as to their suitability for a home introduction according to BSACI guidelines. Those unsuitable for home introduction were characterised as having one or more of the following: previous anaphylaxis to egg, asthma, three or more food allergies, severe multi-system atopy, previous trace or contact reactions to egg, complex or significant co-morbidities and aged 5 years or older.

**Results:** Over the 3-year period, 272 children were referred for a hospital-based baked egg challenge and 242 challenges were performed. Of the those not challenged, 42% had already introduced baked egg at home prior to being offered a challenge slot. In total, 186 (77%) of children successfully tolerated the baked egg challenge. Only 0.8% of all challenges had a moderate or severe reaction and no one received adrenaline.

Of those referred, 92 (38%) children would have been eligible for home introduction. The successful challenge rate in this cohort was

81%, with 9% being unsuccessful in passing the challenge and almost 10% were abandoned. No children exhibited either moderate or severe reactions to baked egg ingestion in this group. Interestingly, in the entire cohort 7% of all challenges were abandoned and of those 35% went on to successfully introduce baked egg at home.

**Conclusions:** In our population, home introduction of baked egg according to BSACI guidelines was safe and could have prevented the need for up to 38% of all hospital-based challenges. While waiting for a challenge, a significant proportion of children underwent baked egg introduction at home, suggesting it is feasible and acceptable to many families.

### A046 | A structured home-based egg ladder can reduce the demand for hospital-baked egg challenge

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**Objectives:** The objective of the study was to assess whether the implementation of a structured home-based egg ladder can reduce the demand for hospital baked egg challenge.

**Method:** This retrospective survey of all the children who had undergone inpatient hospital-based egg challenge at a tertiary care unit for paediatric allergy from 2017 to 2022. In 2021 the use of the home-based egg ladder was implemented after the BSACI egg allergy guideline was published for children with mild to moderate egg allergy. Data were collected from electronic patient records.

**Results:** Before implementing the home-based egg ladder, the recorded data from 2017 to 2019 showed that 11.11%, 22.22% and 15.62% of egg challenges, were reported to result in hospital admissions. Baked egg challenge accounted for the majority of the food challenges. None of the hospital-based challenges was conducted in year 2020 due to the COVID-19 pandemic. The BSACI egg allergy guideline was published late 2021 and in 2021, 14.7% of the challenges were for baked egg challenges and in 2022, 3.03% challenges were for baked egg challenges. These findings suggest that the implementation of the structured home-based egg ladder led to a reduction in hospital admissions for egg challenges, particularly evident in 2022. Home introduction has the advantage of not needing to consume full dose as per PRACTALL guidance while in the hospital and allows a slower introduction with suitable counselling. Review of patients encouraged to introduce baked egg at home suggest most have made good progress.

**Conclusions:** The use of structured home-based egg ladder on selected mild non-anaphylactic egg-allergic children to be safe, preventing unnecessary, time-consuming and expensive inpatient supervised challenges that strain scarce allergy clinic resources. Furthermore, it allows slower introduction of baked eggs at home and at an age earlier than possible with waiting times. Future prospective studies can establish the role of home egg introduction in childhood allergy management.

### A047 | Infants with IgE-mediated egg allergy introducing baked egg into the diet at a younger age are more likely to outgrow their allergy 5 years post-diagnosis

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**Objectives:** The objective of the study was to identify whether age of introduction of baked egg in infants with IgE-mediated egg allergy effects achievement of tolerance to raw egg 5 years after diagnosis.

**Method:** New allergy outpatient appointments at Sheffield Children's Hospital in 2017 were scrutinised to identify new diagnoses of IgE-mediated egg allergy in infants under 2 years of age. Children with sensitisation alone and no clinical reactions were excluded. Medical records were reviewed to ascertain clinical characteristics and outcomes.

**Results:** 87 children were identified (56 male, 31 female) with average age 12.2 months. 54.0% had isolated egg allergy, 20.7% 1 other IgE food allergy, and 25.3% had multiple allergies. 48.5% of children tolerant to baked eggs at diagnosis outgrew their allergy, versus 33.3% of those not known to be tolerant. The chances of outgrowing egg allergy at 5 years post-diagnosis were 85.7% when baked egg was introduced under 12 months of age; 50.0% when introduced 12 to 18 months of age, 31.6% when introduced between 18 and 24 months; 23.5% when introduced between 24 and 30 months; 40.0% when introduced between 30 and 36 months (eight children), 42% when introduced older than 36 months (seven children). 11.5% of children were unable to tolerate baked egg 5 years after diagnosis.

**Conclusions:** The children with baked egg introduced into the diet as younger infants were more likely to tolerate raw egg 5 years post-diagnosis. This suggests those high-risk children needing hospital based baked-egg challenge as per BSACI guidelines 2021 should be prioritised on food challenge waiting lists, and those who meet criteria for home re-introduction of egg should be encouraged to do so from initial diagnosis.

### A048 | Working from home: Evaluation of progress up the IFAN egg ladder after initiation by phone consultation only

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**Objectives:** Egg allergy remains the most common childhood food allergy. Resolution is likely in most by 5–6 years. However children commonly spend most of their preschool years avoiding egg containing foods. Over emphasis on need for allergy testing and formal outpatient evaluation delays reintroduction of egg into the diet. The purpose of this study was to examine the success of egg introduction using a ladder-based programme in the home setting, in patients whose parents had been advised to introduce egg after only a phone consultation.

**Method:** A retrospective chart review was carried out. Infants referred between May 2020 and May 2021, with a history consistent with egg allergy at less than 1 year, were included, provided they had started the IFAN Egg Ladder without prior skin-prick test. Infants with history of egg anaphylaxis or non-IgE-mediated egg allergy were excluded. A phone questionnaire was completed by the study team with the parents/guardians.

**Results:** 48 of 69 families completed the study questionnaire. 17 were lost to follow-up. 36(77%) had atopic dermatitis. Average age at initial reaction was 6.5 months. 20% had another food allergy. Mean interval between reaction and starting the IFAN egg ladder was 2 months + 18 days. 31(61%) infants had already reached Level 3. Average time to tolerate scrambled egg was 9.93mths. 12(23%) patients were still on Level 2. 8(16%) remained on Step 1 with two having discontinued completely. 113(27%) reported infant food refusal. Six mild reactions were reported. None required medical attention.

**Conclusions:** The study provides further evidence that there is no safety-based or tolerance-based indication to delay introduction of baked egg to 1 year of age. In the correctly chosen cohort of infants, the IFAN egg ladder is a safe, effective way of ensuring that infants are not avoiding egg any longer than is necessary.

## A049 | A retrospective comparison of supervised and home egg introduction challenges for paediatric IgE-mediated egg allergy: guideline review, recommendations and home package installation

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**Objectives:** Severe IgE-mediated allergy leads to life-threatening anaphylaxis and is an increasing burden on the National Health Service with long waiting lists for supervised hospital-based introduction (SI). In 2021, the British Society of Allergy and Clinical Immunology (BSACI) published new guidance on home introduction (HI) for egg allergy covering; age at introduction (>12 months), high-risk children (uncontrolled asthma, severe multisystem allergy or, severe index reaction), investigation thresholds (skin prick test <13 mm, ovomucoid <11 KAU/L), practicalities of HI and dietician input. This retrospective analysis compared (a) home (HI) and supervised (SI) introduction; (b) benchmarked local practice against the BSACI egg guideline.

**Method:** Appointment calendars identified patients who underwent egg introduction between 01 January 2021 and 31 December 2021 at the Great North Children's Hospital. Retrospective data regarding patient demographics, investigations and past reactions were collected from electronic records. SI and HI cohorts were compared using Mann–Whitney, Chi-square and *t*-tests. Additionally, compliance with the BSACI recommendations were assessed.

**Results:** 197 children underwent egg introduction: 131 children underwent SI (median age 39 ± 57 months, 35.1% female) and 66 underwent HI (median age 27 ± 39 months, 42.4% female). SI had a marginally higher pass rate (81.7% vs. 74.2%, $p = 0.0004$), but less likely to result in dietary inclusion (42.2% vs. 94.5%, $p < 0.001$), and more common in dual-income households (45.2% vs. 20.0%, $p = 0.034$). Local practice largely agreed with BSACI guidelines, >70% cases met recommendations for introduction age, high-risk children and investigations; dietician input for HI was only achieved in 60% cases.

**Conclusions:** HI outcomes are comparable to SI; HI can be performed safely in children <12 months but should be avoided in 'high-risk' children (described previously). This criteria influenced a 'HI pack' (information leaflets, outcome forms for patients/carers), and a local standard operating procedure. Both are developed and will be implemented (May 2023) to standardise the allocation and experience of HI.

## A050 | A prospective comparison of supervised and home egg introduction challenges for paediatric IgE-mediated egg allergy: Home introduction package and frequently asked questions

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**Objectives:** In 2021, the British Society of Allergy and Clinical Immunology published guidance on home introduction (HI) for egg allergy. Part A: This prospective analysis compared Safe and High Risk Supervised Introduction (SI) against standardised BSACI egg guidelines. Part B: A prospective analysis of the 'HI pack' (information leaflets, frequently asked Questions, outcome forms for patients/carers), based on results from Part A, and implementation of a local standard operating procedure.

**Method:** Appointment calendars identified patients prospectively over 18 months (01 January 2022–30 June 2023) requiring egg introduction. Part A:Verbal consent, prospective data (demographics, investigations, allergic reactions) was collected, and SI/HI cohorts were compared using previous ROC analysis index investigations predictive of failure for subsequent SI (4.5 mm (SPT)/10.75 KAU/L (SpIgE Ovomucoid). Part B: reviewed the new HI Pack with recommendations.

**Results:** Part A: 265 children: Male 152 (57.4%) and female 113 (42.6%) were recruited. Between 01 January 2022 and 30 September 2022, 128 (48.3%) underwent baked or neat egg SI: 84 (65.6%) passed, 15 (11.7%) inconclusive, 21 (16.4%) failed with 1 (0.8%) anaphylaxis). 2 (1.6%) non-attenders and 6 (4.7%) cancelled. Between

01 October 2022–31 May 2023, a further 137 (51.7%) were pending egg challenges. 89(65.0%) were prospectively invited to HI or SI and 48(35%) were invited to clinic for review to trial the HI Package (Part B). Subsequent benchmarking against 48 children showed 14 (29.2%) invited for SI, 11 (23.0%) the HI Program, and 15 (31.3%) cancelled as, inappropriate 4 (26.7%), already re-introduced 9 (60.0%) or parent declined 1 (6.7%).

**Conclusions:** Key recommendations for HI remain (1) <13 years of age with (2) no chronic disease, (3) clinical history exclusive of angioedema (4) low risk co-morbidities, (5) egg introduced 4–5 times a week prior to next level and (6) parental compliance with adequate English language and minimal anxiety. A 'HI pack' and a local standard operating procedure support and enhance the experience of HI.

## A051 | A retrospective analysis of risk factors associated with 'failing' egg introduction for paediatric IgE-mediated egg allergy

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**Objectives:** Severe IgE-mediated allergy can lead to life-threatening anaphylaxis. The prevalence of IgE-mediated egg allergy and waiting lists for supervised hospital-based introduction (SI) are increasing, leading to unnecessary exclusion and prevention of immune tolerance to egg protein. Home introduction (HI) poses a solution, but how do we decide who is appropriate for HI? This study aimed to determine risk factors for anaphylaxis to egg protein and proposes pragmatic criteria for offering children SI or HI.

**Method:** Appointment calendars identified patients who underwent egg introduction under the Great North Children's Hospital between 01 January 2021 and 31 December 2021. Data (patient demographics, investigations and past reactions) was collected retrospectively from electronic patient records. Pass and fail cohorts were compared using Mann–Whitney, Chi-square and *t*-tests, receiver operating characteristic (ROC) curves and logistic regression.

**Results:** In this period, a total of 197 children were invited for food challenge. 164 (83%) children passed (no allergic reaction) egg introduction challenges (median age 31 ± 41 months, 39.6% female) and 25(17%) children failed (median age 50 ± 88 months, 44.9% female). SI had a marginally higher pass rate (81.7% vs. 74.2%, $p = 0.0004$). Several variables were significantly higher in the cohort failing SI/HI: atopic asthma (AA; $p = 0.009$), allergic rhinitis (AR; $p = 0.002$), index skin prick test (SPT; $p = 0.005$), index Specific IgE (SpIgE; $p = 0.009$) and dietetic input ($p = 0.02$). ROC analysis found index investigations most predictive of failure, with cut-off values of 4.5 mm (SPT) and 10.75 KAU/L (SpIgE Ovomucoid). Logistic regression modelling had good overall accuracy (0.76) but identified the fail cohort poorly (with an unacceptable false pass rate).

**Conclusions:** Predicting the outcome of egg introduction remains a challenge. Our key recommendations for selecting patients for HI are (1) low risk co-morbidities (mild/ controlled AA/AR), (2) SPT <4.5 mm and (3) Ovomucoid SpIgE <10.75 KAU/L. All children with food allergy undergoing introduction should receive dietician input.

## A054 | Outcomes of baked milk food challenges in a paediatric allergy service 2014–2023

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**Objectives:** Following two episodes of refractory anaphylaxis during baked milk food challenges (BM-FC), we sought to assess any predictors of BM-FC outcomes within our paediatric allergy service.

**Method:** Retrospective database review of BM-FC at Imperial College NHS Healthcare Trust between 2014 and 2023: demographic, sensitisation, reaction history and food challenge outcome data were analysed. For those who reacted during food challenge, symptoms and severity of reaction was recorded, as well as any previous history of reaction to baked milk.

**Results:** A total of 155 challenges to baked milk were performed over an 8-year period. Patients were aged 0.5–18 years (median age 7 years). 15 patients (9.7%) reacted, including six with anaphylaxis, two of which were refractory anaphylaxis reactions. 10 (6.5%) BM-FCs were incomplete due to food refusal and therefore inconclusive. There was no statistically significant difference between the mean skin prick test (SPT) results to cow's milk extract, fresh cow's milk or specific IgE to cow's milk between those who reacted versus those who tolerated baked milk. Component tests were not commonly available. In the reactor-group, 3/15 had a previous history of reaction to baked milk, one patient experienced anaphylaxis at food challenge.

**Conclusions:** The majority of patients selected for baked milk food challenge were able to tolerate this without reaction. The predictive factors for reactivity to baked milk are not clearly defined and a prospective study utilising all currently available test modalities would be helpful.

## A055 | Using electronic patient records to identify IgE-mediated milk allergy patients who have not begun reintroduction to milk, to mitigate persistent reactions in later life

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**Objectives:** Early-life milk reintroduction, following diagnosis of IgE-mediated milk allergy, may protect against persistent milk allergy and thereby reduce risk and improve quality of life. Where appropriate, this should be initiated in paediatric patients from 12 months of age. A significant proportion may have not achieved reintroduction,

partly due to service interruption during the pandemic. In this work, we set out to identify the cohort of eligible patients who were lost to follow-up and hence may have not had milk reintroduced using an electronic patient-record system (EPIC).

**Method:** Inclusion criteria were a typical history of cow's milk allergy and a positive skin prick test in children aged between 5 and 21 years. Electronic patient records from 2015 were searched. Codes for clinics, paediatric allergy consultants and milk allergy were used to search for key words in patient notes. Cases were then filtered by individual screening to confirm whether they met inclusion criteria, with presumed eligibility where information was missing. Cases were organised by time of last appointment.

**Results:** 122 patient records were screened (last appointment at the clinic between November 2014 and April 2018). In that time period, 38 (31.1%) had IgE or suspected IgE-mediated milk allergy (the remaining 84 (68.9%) non-IgE mediated milk allergy cases were excluded); $n = 25$ (20.5%) patients were eligible (lost to follow-up). In all cases, reintroduction via a milk ladder was either recommended immediately or identified as a future target after a follow-up period.

**Conclusions:** Screening through electronic patient records can be an efficient methodology to identify IgE-mediated milk allergic patients lost to follow-up. Most losses occurred 2020–2022, suggesting the pandemic had a strong influence. Future work will involve contacting this cohort to identify the proportion who have successfully reintroduced milk and complete the care pathway for those who have not.

## A056 | Facilitating screening of high-risk infants prior to early weaning at Staffordshire Children's Hospital

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**Objectives:** The Learning Early About Peanut Allergy (LEAP) study has shown the effectiveness of early peanut introduction in the prevention of peanut allergy. BSACI guidance for preventing food allergy in higher-risk infants recommends that children with severe eczema or existing food allergy should introduce allergens from the age of 4 months.

This study aims to investigate the feasibility of providing urgent allergy clinic appointments to children referred with existing severe eczema and/or egg allergy (as per LEAP criteria) in order to skin prick test (SPT) to peanuts before early allergen introduction in this high-risk group.

**Method:** We conducted a retrospective review of the children below the age of 1 year who were referred to Staffordshire Children's Hospital allergy service in the last 2 years (January 2021–December 2022 inclusive) using the hospital's electronic record.

**Results:** Seven children across the 2 years were referred with severe eczema or known egg allergy. Six were seen and SPT within 4 weeks, and 1 at 5 weeks post-referral. All of these had negative SPT to peanuts and were advised to introduce all allergens at home. Nineteen were referred as suspected egg allergy. Two had already been introduced to peanuts and of the remainder, 88% were SPT to peanut in addition to egg. Four of these were SPT positive, and three were listed for the challenge.

**Conclusions:** Electing to see and SPT high-risk children prior to the introduction of allergens resulted in only seven extra allergy clinic appointments across 2 years with no extra challenge burden as yet. We have the flexibility in our service to facilitate urgent appointments for them to avoid delays in weaning and will continue with this practice. All suspected egg allergy will continue to have peanut SPT at diagnosis, and we give BSACI early weaning advice to all families across the service.

## A057 | A geographical representation of food choice and health care access for late adolescents (18–25 years) with and without food allergies in North West, England

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**Objectives:** Using spatially optimised geographical software (QGIS and ArcGIS), this research presents a geographical representation of the current food and health care access for late adolescents with and without food allergies. The research was focused in North West, England—a recognised area of socio-economic deprivation. This is the first UK piece of research utilising a mapping technique to visually demonstrate food and health care access, for late adolescents with and without food allergies.

**Method:** A quantitative questionnaire determined distance travelled by each participant to purchase healthy, nutritious food, allergen free food and health care access through GP and hospital services. QGIS was used to create a geographical representation through latitude and longitude coordinates, which were generated using the 'outcode' (first part of UK postcode e.g. PR for Preston and L for Liverpool). Data was normalised to address the unequal number of participants from each city/town, allowing for comparison between counties.

**Results:** Data from 18 cities/towns from four counties in the North West (Cheshire, Lancashire, Merseyside and Greater Manchester) were collected. Overall, food allergic individuals travelled longer distances to obtain food and health care. Areas in Cheshire and Merseyside had reduced access to food in comparison to other counties. All counties in particular struggled to access allergen free food, with those in Greater Manchester having greater difficulty. Primary

health care was more difficult to access in Merseyside and Greater Manchester, while those in Cheshire had more difficulty in accessing secondary and tertiary health care. From the four counties, Chester, Bolton, Blackburn with Darwen and Liverpool were among the most deprived cities/towns with regard to food and health care access.

**Conclusions:** The findings have important implications in informing policymakers (NHS and local councils) to address inequities through the development of necessary interventions, that prioritise neighbourhoods with reduced access to food and health care.

### A058 | A review of peanut and tree nut allergy in a secondary care paediatric allergy service (preliminary data) lister hospital, East and North Hertfordshire NHS Trust

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**Objectives:** The objective of the study was to develop a database of peanut and tree nut allergic patients reviewed at the Paediatric Allergy Service and to review management based on BSACI guideline which will aid in risk stratification of patients for consideration of oral peanut immunotherapy.

**Method:** This is a retrospective review. Data were collected from a database of allergy action plans and clinical notes of children who have been reviewed in Paediatric Allergy Clinic with focus on clinical history, signs and symptoms and clinical management including allergy testing results. The data were entered directly into Microsoft Excel and analysed.

**Results:** This is the preliminary data based on review of all patients diagnosed with peanut and tree nut allergy.

There are 223 patients identified thus far: 50.67% have peanut allergy, 8.96% have tree nut allergy and 23.31% have both peanut and tree nut allergy. 40.36% had SPT, 24.22% had Specific IgE, and 29.15% had both. Out of 223 patients, 63.68% are male; 36.32% are female. Majority of patients (69.96%) have mild to moderate symptoms, while 28% had anaphylaxis.

Of the 223 patients, 28% have history of anaphylaxis and carry adrenaline auto-injector (AAI) devices with corresponding training on administration. All nut allergic patients have an allergy action plan, patient information leaflet and advice regarding avoidance of allergens.

56.5% have associated eczema, 35.43% with asthma and 20.63% with other associated food allergy, predominately the egg and milk.

**Conclusions:** Based on our preliminary data, our patients with nut allergy have been appropriately managed according to BSACI guidelines, with particular note of risk assessment for anaphylaxis. The database which was created for this review was particularly useful in reviewing the allergy service activities and identifying trends and co-morbidities. The data collection is ongoing and final results will be reflected once completed.

### A059 | Trends in service provision with regards to management of nut allergy across the United Kingdom

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**Objectives:** Since the publication of The British Society for Allergy and Clinical Immunology (BSACI) guidelines on management of nut allergy in 2017, little is known regarding current practice in the United Kingdom (UK). We sought to identify whether there were any regional differences in service provision.

**Method:** Between 2022 and 2023 an online survey was disseminated through BSACI and local allergy networks to BSACI members and non-members. Clinicians involved in allergy management were invited to complete information on their allergy service.

**Results:** 249 surveys were completed of which 190 (76%) were BSACI members and 59 (24%) non-members. 88% ($n = 219$) of responders managed children exclusively. Due to the small number of responders across regions and allergy networks, data for local education training boards was combined. 193 surveys were analysed that were fully completed or had an assigned region. Greater than 90% of responders across the UK-reported access to skin prick testing (SPT) or specific IgE testing, information leaflets, written plans and provision of adrenaline autoinjectors (AAIs). However, 74% (17/23) responders in London had access to a dietician in clinic versus 35% (13/37) in the North. Three NHS trusts (Ireland, Wales and London) reported access to a psychologist in clinic. Greater than 90% in all areas except Midlands and East (62%, 39/63) would advise carrying 2 AAIs at all times.

**Conclusions:** The provision of SPT or specific IgE testing, information leaflets, written plans and AAIs is uniform across the United Kingdom but the ongoing postcode lottery of health care between different geographical locations is highlighted by availability of dieticians and psychologists. The difference in Midlands and East regarding carrying two AAIs at all times could be due to local policy, close proximity of hospitals available and with the launch of spare pens in schools a review rationalising the use of AAIs is needed with more detailed guidance.

### A060 | Analysis of BSACI Nut Allergy Survey: Regional variations

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**Objectives:** In 2017, BSACI published guidelines on management of nut allergy. Our objective was to discover any differences in management practices across deaneries and allergy networks, via an online survey.

**Method:** Between 07 December 2022 and 03 February 2023, BSACI members and non-members were asked to complete this survey which consisted of clinical questions posed on typical food allergic symptoms from ingestion of nuts, pollen food syndrome (PFS) and more complex cases.

**Results:** A total of 249 responses were captured, of which 201 responded adequately. 84% (209/249) were part of a regional allergy network.

61% (122/201) respondents favoured prescribing adrenaline autoinjectors (AAIs) for mild-to-moderate peanut reaction with positive SPT, peanut PFS with a background of asthma or peanut PFS with positive Ara h 2. Not prescribing AAI for these scenarios except where asthma was a comorbidity averaged at 80% (8/10) in the Northern Paediatric Allergy Group and 71% (10/14) in the Children and Young Peoples Allergy Network (CYANS), Scotland, contrary to some of the other networks.

96% respondents (193/201) advocated peanut exclusion in dietary management of peanut positive anaphylaxis but 28% (57/201) allowed foods with precautionary allergy labelling (PAL). For peanut related PFS, 49% (98/201) wanted to exclude peanuts and 71% (141/201) advised patients could consume foods with PAL. For tree nut anaphylaxis, 75% (151/201) favoured avoiding tree-nuts. 22% (4/18) respondents from British Paediatric Allergy Group versus 43% (6/14) from CYANS advised avoiding foods with PAL.

Provisions like SPTs, IgE testing were constrained in primary care when compared with secondary and tertiary care.

**Conclusions:** Numerous similarities were noted in allergy practices of deaneries and allergy networks across UK. The management of PFS is variable. The differences that exist may be due to consensus among local allergy networks. New guidelines on PFS were published in 2022 by BSACI which will aid clinicians in making practice more consistent.

## A061 | National survey of BSACI nut allergy guideline

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**Objectives:** In 2017, the BSACI nut allergy guideline was published. The aim of this survey was to audit the diagnostic pathways and establish current dietary and medical management of nut allergy (NA).

**Method:** Between 07/12/22 and 03/02/23, the BSACI membership were asked to complete a 20-question online survey covering diagnosis and management of NA.

**Results:** 19%, 190/979 completed the survey. 55%, 105/190 were Paediatric allergists/Paediatricians with allergy interest. Questions relating to investigations would result in 94%, 140/149 and 96%, 142/148 diagnostic accuracy for peanut allergy (PA) and pollen food syndrome (PFS). Despite typical histories of PA and PFS, 29%, 43/149 and 71%, 105/148, respectively, recommended component resolved diagnostics (CRD). Only 61%, 89/146 suggested CRD for a grey case of PFS/hazelnut allergy.

Dietary advice for avoidance of the index nut was consistent using a case of PA and tree nut (TN) allergy at 97%. 76%–77%, 118–120/155 recommended additional TN avoidance only if sensitised and not tolerated. 30%–32%, 47–49/155 of HCPs advised on ability to consume foods with nut precautionary allergen labelling (PAL), while 32%–34%, 50–52/155 suggested the contrary.

Prescribing AAIs for cases of anaphylaxis to peanut (99%, 147/149) and PFS with no asthma (11%, 17/153) were consistent. In PA with a systemic reaction (no A,B,C involvement) and sensitisation, PFS with well controlled moderate/severe asthma, and mild oropharyngeal symptoms to peanut (positive Arah2 & 8) had more variation with 64%, 98/154, 53%, 82/154 and 61%, 94/154, respectively, recommending AAIs.

**Conclusions:** Diagnosis of NA relies on history and SPT/specific IgE which is consistent with the guidelines although there appears to be increasing use of CRD which should be reserved for cases of diagnostic uncertainty.

Variation exists relating to avoidance of other nuts apart from the index nut. Significant variation in PAL exists thus consensus among HCPs may improve shared decision making.

Review of prescribing practises of AAIs may be beneficial to determine whether greater consensus can be reached among HCPs.

## A062 | Impact of peanut allergy on the quality of life of children and their parents or guardians in Europe

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**Objectives:** The objective of the study was to describe differences in quality of life (QoL) among two types of families with children aged 4 to 11 years: those with peanut allergy (PA) and those with no food allergy (NOFA) in France, Germany and the United Kingdom.

**Method:** Representative samples of parents or guardians of children with self-reported PA or NOFA were recruited through online panels

and patient advocacy groups from October to December 2021 and asked to complete a web-based survey. The impact of PA on QoL was assessed with the EQ-5D-Y Proxy version 1 which included a Visual Analogue Scale (VAS), and an adapted version of the FA-EcoQ. Multivariable linear, ordinal and logistic regression models were used to compare QoL endpoints between groups while adjusting for country differences. EQ-5D-Y utility scores were calculated using the Spanish value set.

**Results:** Parents or guardians of 535 PA and 751 NOFA children were enrolled across all countries. In a linear regression analysis, the PA group had a significantly lower VAS score than the NOFA group (81.8 vs. 87.6, $p < 0.0001$) and a significantly lower utility score (0.88 vs. 0.92, $p = 0.0017$). Ordinal logistic regression analyses showed that 'feeling worried, sad or unhappy' or 'having pain or discomfort' were the factors which contributed most substantially to the results derived from the linear regression analysis ($p < 0.0001$ and $p < 0.005$, respectively) of the EQ-5D-Y data. Logistic regression models using FA-EcoQ data showed that PA had a significant ($p < 0.05$) or highly significant ($p < 0.0001$) impact on nine out of 14 life events, including: changing jobs (parents), restricted social life or participation in sports or hobbies (children) and emotions such as anxiety or fear (parents/children).

**Conclusions:** This study demonstrated that PA in children is associated with worse QoL and detrimentally affects significant life events. This research increases our understanding of the impact that PA has on children and their families.

## A063 | Nut recognition within an ethnically diverse population: A tough nut to crack

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**Objectives:** There are limited studies that assess how effectively children and adults can identify different nuts. To our knowledge, no studies have collected data relating to ethnicity and recognition. Nut avoidance is a key management strategy in nut allergy. We sought to identify how well patients and parents/carers attending paediatric allergy clinic could identify different nuts and evaluate whether differences were observed between ethnicities.

**Method:** This study was completed between 25th April and 20th December 2022. Children and parents/carers attending allergy clinic with suspected or confirmed nut allergies were invited to complete an anonymous survey accessible via QR codes in different languages. Data were collected including ethnicity, allergy status, previous hospital admissions and EpiPen use. The respondent was shown sequential images of 10 nuts to identify from a list provided.

**Results:** Ninety-eight surveys were completed. Most surveys were completed by a parent/carer (82.7%), and mostly completed in English (92.9%). Responses represented patients across 14 ethnicities, predominantly White-British, Indian and Pakistani ethnicities. Across all respondents, a median of seven nuts were correctly identified out of 10. Most well-identified nuts were pistachio, almonds and cashews (89.1%, 87%, 87% correctly identified respectively). Less well-identified nuts were pecan, pine and macadamia (49.0%, 42.4%, 39.1%). Compared with all ethnicities, White-British respondents had the highest median score of 7.5 out of 10, which was not significant ($p = 0.13$). All ethnicities had a similar ability in identifying nuts. There were no significant differences between ethnicities in hospital admissions ($p = 0.99$) or EpiPen use ($p = 0.68$) due to nut allergy.

**Conclusions:** For patients attending our allergy clinic, we found no differences in ability to identify nuts between ethnicities. Limitations of this study are the small sample size and no assessment of processed nuts. A need was highlighted to improve our patients' ability to identify nuts, particularly for those that were poorly identified in this survey.

## A064 | Nuts about cooking: Recognition of nuts among restaurant staff in an ethically diverse population

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**Objectives:** Food law in the United Kingdom demands that all food catering businesses must ensure staff receive allergen training. Food businesses must also inform customers if any foods they provide contain allergens. We sought to investigate whether restaurant staff were able to identify different types of nuts and gain information on any allergen training received.

**Method:** Twenty restaurants were approached on 24/03/23 and invited to fill in an anonymous survey via QR codes. Restaurants were within three miles of Birmingham City Hospital and selected via random number generator. Data collected included job role, cuisine served, allergen training received and ability to recognise an allergic reaction. Respondents were then shown sequential images of 10 different nuts to identify from a list provided.

**Results:** 16 responses were received; 15 completed in person and 1 online. A wide variety of cuisines and restaurant styles were sampled, as well as various staff roles including table service, chefs and managers. 81% of staff had received allergen training and 54% of training had been organised by the restaurant. 87% of staff felt that they could identify an allergic reaction, and most common symptoms listed were respiratory symptoms (71% of staff), angioedema (50%) and rash (50%). Across all respondents, a median of 6.5 nuts were correctly identified out of 10. Most well identified nuts were pistachio, almonds and cashews (93.8, 93.8%, 87.5% correctly identified, respectively). Less well identified nuts were pecan, pine and macadamia (43.8%, 37.5%, 43.8%).

**Conclusions:** Despite most staff members having completed allergen training, their abilities in identifying nuts varied. This highlights a need to improve their ability to identify different nuts and may require standardised allergen training courses with a section on nut

recognition. Limitations of this study include small sample size and no assessment of recognition of processed nuts.

## A065 | Outcome of food challenges for children <18 months with sensitisation to peanut, tree nuts and/or sesame

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**Objectives:** The LEAP and EAT studies demonstrated the benefit of early introduction of allergenic food, particularly in high risk infants, in prevention of food allergy.

- To review the outcome of food challenges to peanut, tree nuts and/or sesame in children <18 months
- To review severity of reactions in positive challenges
- To compare food challenge outcomes by SPT size

**Method:** We used the data base for food challenges conducted at St Georges' Hospital between April 2018 and April 2023 (5 years). We collected data for all children <18 months of age (at time of challenge) attending for food challenges to peanut, sesame and/or tree nuts.

Age at time of challenge, gender, comorbidities, SPT, comorbidities and the challenge outcome were recorded. Details of reaction and treatment given at positive food challenges were also recorded.

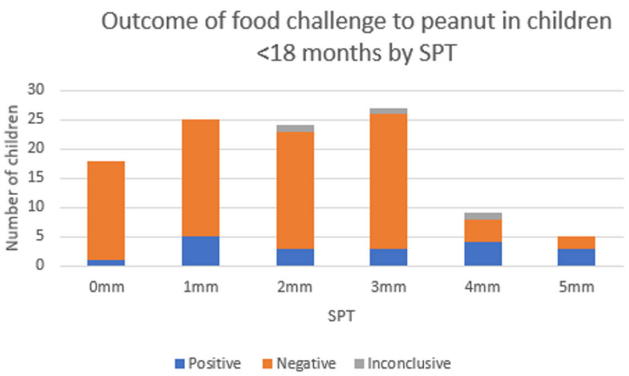
**Results:** A total of food 138 challenges were performed to almond (5), cashew (5), hazelnut (1), peanut (109), sesame (17), walnut (1) in children <18 months (range 5–17 months, median 10 months).

Seventeen per cent (24/138) of challenges were positive, 2% (3/138) were inconclusive and 80% (111/138) were negative.

Food challenges to almond ($n = 5$) were all negative. SPT ranged from 1 to 4 mm. 40% (2/5) of challenges to cashew were positive. All cashew challenges had SPT 3 mm.

Eighteen per cent of both peanut challenges (19/108) and sesame (3/17) challenges were positive. For peanut food challenges (graph 1) one child had a positive challenge following a 0 mm wheal—symptoms were consistent with FPIES reaction.

There were no episodes of anaphylaxis.




**Conclusions:** A cut-off for SPT of ≤5 mm to peanut in this patient population is reasonable. A higher cut off may be considered given the low risk of severe allergic reactions and potential to prevent food allergy.

No severe IgE-mediated allergic reactions occurred at food challenge in this population.

## A066 | Oral food challenge to peanut and tree nut in a tertiary allergy centre: Predictors of challenge positivity and anaphylaxis

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**Objectives:** Oral food challenge is the gold standard for food allergy diagnosis and is particularly useful when clinical history contradicts skin prick test (SPT) and specific IgE test, or there is suspicion that an allergy is outgrown.

Aim: The aim of the study was to determine the rates of positivity to oral food challenge with peanut and tree nut in our cohort and identify predictors of challenge positivity including anaphylaxis.

**Method:** A retrospective chart review of all patients who undertook an oral food challenge with peanut and tree nuts in the paediatric allergy department at King's College Hospital between March 2022 and March 2023. Data was collected on age, sex, ethnicity, history of atopy (asthma, eczema, allergic rhinitis, multiple food allergy), positive-specific IgE and SPT. Statistical analysis was performed using R studio (two-sample $t$ test for continuous, $\chi^2$ for categorical data).

**Results:** 59 patients attended for a food challenge and 5 were not completed. 61% were male. 56% of patients reacted, with 10% experiencing anaphylaxis (18% of those reacting); similarly distributed for peanut and tree nuts. Anaphylaxis occurred in an older age group than for milder reactions, although statistically insignificant. Anaphylaxis occurred to peanut (3), cashew (2) and mixed hazelnut/almond (1). Of eight cashew challenges 50% were positive with a 25% rate of anaphylaxis.

History of rhinitis predicted a positive reaction ($p = 0.007$). Positive SPT ($p = 0.0005$) and increased mean SPT wheal size ($p = 0.001$) correlated with risk of positive challenge. None of the tested parameters predicted anaphylaxis over mild reaction.

**Conclusions:** Positive reactions to oral food challenges with peanut and tree nut were predicted by history of rhinitis and positive and increased SPT. Positivity and anaphylaxis was more frequent in older patients. Anaphylaxis occurred more frequently for cashew challenges. No predictors of anaphylaxis over mild allergic reaction were found; however, sample sizes were relatively small.

No external funding sources.

### A067 | Paediatric food challenge outcomes: Findings from a district general hospital service

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*Kingston Hospital NHS Foundation Trust, Kingston-upon-Thames, UK*

**Objectives:** The objective of the study was to evaluate the indications and outcomes of food challenges (FCs) conducted in a secondary care paediatric allergy service.

**Method:** Data from all FCs requested from 05.07.2019 to 13.11.2022 were collated on a secure Excel spreadsheet. Clinicians ordering FCs recorded request date, indication for challenging, skin prick test (SPT) results and atopic co-morbidities. SPT was repeated prior to FC if the previous result was older than 6 months. FCs were conducted using PRACTALL doses and outcomes recorded, including clinical reactions, eliciting allergen dose and management (antihistamines or adrenaline). Data were checked against electronic patient notes.

**Results:** 411 FCs were requested: 79% ($n = 325$) were attended, of which 18.5% failed ($n = 60$); 1.8% were inconclusive ($n = 6$); 70.8% were passed ($n = 230$) and 8.9% ($n = 29$) were not done due to increased SPT response prior to FC. Four incidences of anaphylaxis occurred: one to baked milk (SPT: 6 mm to cow's milk extract, 7 mm to fresh milk, 7 mm positive control), two to peanut (SPT respectively: 5 mm to peanut and 5 mm positive control; 2 mm to peanut and 4 mm positive control) and one to wheat (SPT: 2 mm to wheat, 4 mm positive control). There was one incidence of food-protein-induced-enterocolitis to prawn. Egg and tree nuts challenges only led to mild reactions, but most were passed, notably almond challenges (1/24 failed).

**Conclusions:** The data supports the potential for safely increasing home egg challenges, thus increasing capacity for hospital-based challenges, and introducing a hospital-based supervised feed service, particularly for tree nuts. Using SPT results alone, rather than together with blood IgEs, provided sufficient information to challenge and was cost-effective. Anaphylaxis incidences highlight that patients with multiple atopic comorbidities should be challenged in hospital, even with low SPT responses. Lastly, the number of non-attendances for FCs impacts negatively on the waiting list and needs to be addressed.

### A068 | Tackling the oral food challenge waiting list and achieving a 'No-wait waiting list.' Reflections from a district general hospital

Elspeth Brooker; Fiona Giles; Emily Isaacs; Elizabeth Walden
*Royal Berkshire Hospital, Reading, UK*

**Objectives:** Children and young people with food allergies may require a day case admission for an Oral Food Challenge (OFC). At our centre, these OFCs are usually to confirm resolution of a food allergy.

Locally, we have struggled to maintain the waiting list for OFCs, with waits of up to 12 months. COVID-19 restrictions and associated delays only compounded this problem. Anecdotally, most centres experience similar difficulties.

We used a multidisciplinary team (MDT) approach to tackle our waiting list, which is now a matter of several weeks.

**Method:**

**June 2021, 343 on waiting list**: Waiting list was reviewed and the following were removed:

- Duplicated orders
- Those who had since been seen in clinic and advised to introduce at home
- Those who had introduced at home while waiting

**October 2021, 250 on waiting list:** Culture change:

- Prior to this date all OFCs ran with a senior medic in the allergy team on the day case ward or at their desk (could not be on other clinical duties)
- A new escalation flow sheet was approved by Paediatric Clinical Governance
- Allergy lead attended Day Bed Unit team meetings to discuss concerns

Appropriate OFCs now supervised by Clinical Nurse Specialist (CNS) regardless of whereabouts of medics.

**January 2022, 198 on waiting list:** Improved bed usage

- CNS went to weekly bed meetings to identify unused beds
- Change in criteria for CNS supervised challenges

**August 2022, 163 on waiting list:** Changes made with administration and team

- Secondment of a further CNS—allowed cover for leave
- Did Not Attend/repeated change in dates by families—zero tolerance
- Changed booking process to ask families near top of list to contact us
- Administration team came to MDT meeting weekly

**Results:**

**March 2023, 0 on waiting list**—date given directly upon order.

**Conclusions:**

- Active maintenance of the list
- Sharing learning across the Trust

## A069 | Oral food challenge outcomes in children and young people in a tertiary allergy centre in Northwest England

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**Objectives:** An oral food challenge (OFC) is a useful diagnostic tool in the assessment of children with suspected food allergies. We sought to identify common patient characteristics in patients who failed an OFC which may aid in the prediction of OFC outcomes.
**Method:** A retrospective review was carried out which included patients, between the ages of 9 months and 17 years who underwent an OFC between April 2021 and August 2022. Data was collected on patient demographics, skin prick test (SPT) results, blood IgE tests results, associated allergies, atopic diseases and outcomes of OFC.
**Results:** 243 patients were included. The total number of food challenges conducted was 286, and 25 patients had an allergic reaction. Only one patient required intramuscular adrenaline. Out of these reactors, 10 patients had a peanut challenge, seven had a baked egg challenge and eight were in the 'other food' category. A total of 17 patients had a reaction but had negative/ incomplete investigations. Of the patients who failed an OFC, eight had a diagnosis of eczema, and 14 had additional food allergies.
**Conclusions:** Peanut was the most common food associated with a failed OFC. Over half of the patients had a reaction at OFC despite negative/incomplete investigations. This reinforces that both SPT and blood IgE tests should not be used in isolation and, where possible and when clinically required both should be carried out before proceeding with an OFC. Additionally, more thorough initial investigations may reduce the need for OFC. This was a single-centre study design with limited sample size. Further large-scale and multicentre study verification including statistical analysis will provide a more accurate representation of Northwest England demographics.

## A070 | Oral food challenges in children: Safety of multi-dose protocol

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*Leicester Royal Infirmary, Leicester, UK*

**Objectives:** Oral food challenges (OFC) carry risks of allergic reactions (reported rates 14–44.6%) as patients are eating foods to assess for potential allergies, or eating foods they are known to be allergic to. OFC protocols are designed to mitigate against severe reactions by patients eating increasing doses of the food under investigation. The rate of dose increments may influence the risk of severe or anaphylactic reactions in positive challenges. Rates of anaphylaxis of 9% to 11% are reported in single-centre US studies where PRACTALL up-dosing guidelines were used. There is a paucity of similar information of UK experience. In the Leicester Children's Allergy Service we use an OFC protocol with small visually measured increasing doses. We assessed the outcomes (and safety) of our approach to OFCs.
**Method:** We reviewed OFCs between 2006 and 2022. Data captured were food challenged, outcome, threshold dose and treatment.
**Results:** During the 17 year time period we conducted 3212 OFCs (2195 to nuts and 1017 to non-nut foods). 641 (20%) were positive; 380 (17%) of nut and 261 (26%) of non-nuts OFCs. IM adrenaline was administered in 24 (0.7%) positive OFCs; 11 (0.5%) of nut OFCs and 13 (1.3%) of non-nut OFCs. Treatment with salbutamol only without adrenaline was administered for wheeze in 42 (1.3%) positive OFCs.
**Conclusions:** In OFC studies with comparable positivity rates, we experienced the lowest incidence of anaphylaxis requiring treatment with IM adrenaline. Our up-dosing protocol therefore achieved similar diagnostic objectives but without severe potentially life-threatening allergic reactions. This preliminary data therefore suggests that this is a safer approach to OFCs.

## A071 | Is it safe to remove the first portion (30 mg of protein) from the food challenge protocol?

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**Objectives:**

- To assess the safety of switching from five portions to four portions (removing the first 30 mg dose) when conducting an oral food challenge.
- To review positives challenges where reactions occurred following the first portion and identify the food and severity of reactions.
- To review all anaphylactic reactions occurring at challenges between 2018 and 2022.

**Method:** A retrospective analysis of the anonymised data which was collected from the database of food challenges performed at our specialist allergy centre between 2018 and 2022. All anaphylactic reactions were included ($n = 15$) and the rest of the data was randomly selected ($n = 65$) from the positive food challenges.
Details about the following were also collected:
Gender, age, ethnicity, challenge food, reaction at which portion, severity of reaction (reported symptoms) and treatment given.
Any pre-existing atopic conditions also noted.
**Results:** Demographics of the 80 positive challenges were Males ($n = 48$) and females ($n = 32$). The age range was between 2 and 18 years old (mean = 8).
Of the 65 positive challenges selected at random, 10% ($n = 8$) of reactions occurred after the first portion. Reactions most commonly occurred after the last portion (25%, $n = 20$).

Positive challenges resulting in anaphylaxis ($n = 15$). None of these occurred following the first portion. All reactions following the first portion ($n = 8$) were mild/moderate - treated only with cetirizine.
Walnuts were the commonest trigger for anaphylaxis ($n = 3$) and reaction at first portion ($n = 3$).
**Conclusions:** A significant proportion of children reacted after the first portion (30 mg protein), therefore it is not currently safe to remove this portion from our food challenge protocol.

- All reactions to first dose were mild–moderate.
- Reactions (including severe/anaphylaxis) were most likely to occur after the last portion (3 g protein).
- Walnuts were the commonest trigger to cause a reaction following first portion and anaphylaxis.

- A closer review of challenges to walnut and thresholds is warranted.

### A072 | Wheat challenges: Our experience: Case series on tolerance to whole-grain wheat cereal products in three wheat allergy children

Tharindi Suriapperuma; Givani Amarakoon; Thisanayagam Umasunthar
*John Radcliffe Hospital, Oxford, UK*

**Objectives:** *Background*: Most epitopes causing IgE-mediated wheat allergy are heat resistant. Three patients with wheat allergy showed different reactions to wheat-containing products, despite identified allergens.
**Method:** *Case-presentation*: A 12-year-old girl with multiple food allergies was successfully challenged with whole-grain wheat cereal biscuits (WWCB) (Weetabix), which were regularly included in her diet without causing allergic manifestations. However, when she consumed Digestive biscuits, she developed hives. She was challenged with Shreddies, where she developed itching and hives 2 h after the top dose. Shreddies was introduced slowly and built up to 12 with no reaction. There was a mild eczema flare-up when it increased further. She reacted on two occasions when accidentally exposed to bread and sausages containing wheat. She continues to eat Weetabix freely.
A wheat challenge was offered to a 5-year-old boy with Shreddies, and following the fourth dose, he developed hives. He was advised to include two Shreddies couple of times per week and is currently eating three with a mild eczema flare-up.
A 4-year-old boy passed the wheat challenge with Shreddies. He could consume Shreddies freely but had abdominal pain with other wheat containing foods. Following a slow introduction, he currently eats pasta freely but reacts when he is unwell.
**Results and Discussion:** Pressure cooking is an important step in the preparation of WWCB. It was shown previously that this processing can alter structure or removal of some wheat proteins and contributes to the decreased allergenicity. Alternative product we used (Shreddies) also goes through multiple heating steps and may not be as allergenic as wheat flour containing food such as bread or pasta. In our three patients, parents were willing to continue to include some wheat containing food as part of the diet.
**Conclusions:** Weetabix tolerance can falsely reassure wheat tolerance. However, it can help liberalize the diet in children with wheat allergy.

### A073 | Evaluation of sesame oral food challenges and supervised feeds in a district general hospital

Rhea Clubb; Ain Satar; Maria Ohrman; Juliana Scapin; Maria Boasiako; Dee Brown; Miriam Tarkin; Caroline Rowley; Gopa Sen; Neeta Patel
*Whittington Health NHS Trust, London, UK*

**Objectives:** The objectives of the study were to review outcomes of sesame incremental oral food challenges (OFC) and supervised feeds (SF) and explore consistency in practice compared with published data.
**Method:** Retrospective review of medical records of sesame OFC and SF at our hospital over a 16-month period from February 2022 to May 2023.

**Results:**

- There were 28 sesame oral food challenges (24 OFC, 4 SF) of patients aged 1–13 years-old with a median age of 4. Of these, 19 (79%) OFC and 4 (100%) of SF were passed.
- All of the 5 (21%) who failed OFC had mild/moderate reactions. Of these, 4 (80%) had previously reported a mild/moderate reaction to sesame. SPT ranges from 0 to 6 and the ages ranged from 5 to 11 years-old. 4 (80%) had a diagnosis of eczema, 2 (40%) had allergic rhinitis and 2 (40%) had asthma. All had other IgE-mediated food allergies.
- 12 (63%) of those who passed the sesame OFC were sesame naïve. Of these, 8 (67%) had a SPT less than or equal to 2 and 3 (25%) had a SPT less than or equal to 2 and had never previously had a SPT greater than 2 or raised sIgE.
- 6 of the 24 OFC patients underwent sesame sIgE testing.

**Conclusions:**

1. None of the patients who had sesame challenge had anaphylaxis. All reactions were promptly managed by allergy-trained nurses.
2. The fail rates are similar to published data on sesame OFC, suggesting our practice is safe with appropriate use of resources.
3. Our department does not use sesame IgE as a single diagnostic test, in keeping with published data regarding its usefulness.

4. We identified a small number of patients who could have had a SF instead of OFC, potentially improving our OFC waiting times.
5. We have reviewed our food challenge selection criteria to improve our service.

### A074 | Coconut allergy profile in an East London Hospital

Keya Sahay[1]; Frances Ling[1]; Rosalynd Gourgey[1]; Lee Noimark[1]; Antony Aston[1]; Kathleen Sim[1]; Morium Akthar[1]; Haseena Jearally[1]; Anar Khole[1]; Constantinos Petrides[2]; Bunmi Raji[1]; Luul Ali[1]; Priya Mistry[1]
*[1]Royal London Hospital and Barts NHS trust, London, UK; [2]Royal London Hospital, London, UK*

**Objectives:**

(1) To determine whether sensitisation with the use of topical coconut products is likely to predispose to coconut allergy.
(2) To determine whether there is an association between coconut allergy and other atopic conditions.
(3) To determine the association of coconut allergy with peanut, tree nuts and sesame allergy and sensitisation.

**Method:** Patients who reported reactions to coconut and had skin prick testing to coconut flour between November 2021 and December 2022 at the Royal London Hospital were included in the study. The selection was based on the history of reaction to coconut which could be either oral or topical. A skin prick test (SPT) of >3 mm and sIgE of >0.35 kUA/L where blood tests for specific IgE were carried out, was considered positive.
**Results:** 27 patients reacted to coconut on oral consumption. 63% had previous topical exposure although only 3 of 17 patients reacted. 92.5% patients who reacted had eczema, 58% had asthma. Majority (81%) had adrenaline autoinjectors for anaphylaxis to coconut, dairy or nut allergy. Two patients with anaphylaxis had history of use of a topical preparation and oral ingestion indicating possible sensitisation.
Both children with anaphylaxis to coconut had peanut SPT >5 mm, one had a negative SPT to walnut and the other had a SPT of 5 mm.

**Conclusions:**

1. Children with coconut allergy/sensitisation have higher predisposition to the atopic spectrum. The population demographics (largely southeast Asian) are culturally known to consume and use coconut-based products as part of their diet and daily routine.
2. Judicious use of coconut-based products to be advocated.
3. Parental and healthcare workers education for the use of coconut-based products.
4. Further studies are required to determine SPT cut-offs for home challenges.

### A075 | Food protein-induced enterocolitis syndrome: Experience of a tertiary allergy service

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**Objectives:** Food protein-induced enterocolitis (FPIES) is a non-IgE-mediated food allergy characterised by delayed gastrointestinal symptoms to identified food triggers, typically occurring in infancy.
Aim: The aim of the study was to understand the characteristics of our patient cohort.
**Method:** Retrospective analysis of patient records of children diagnosed with FPIES in the allergy service at King's College Hospital, between 2006 and 2022. Data collected identified referral source, age at presentation, sex, ethnicity, symptoms and severity of presentation, trigger foods, management and outcomes.
**Results:** 23 patients met diagnostic criteria. The majority were white British (73%) and female (61%). Mean age at first presentation was 8 months. The majority were referred by the GP (74%) and the ED (9%). Mean age of first allergy review was 23 months.
A total of 40 episodes were classified as mild to moderate (42%) or severe (58%), by diagnostic criteria. 52% attended the emergency department and of those 33% were admitted. 52% had eczema and 17% faltering growth.
The majority (56%) had one trigger food, with 21% having two and three triggers, respectively. 13 individual food triggers were identified with subjects affected as follows: cow's milk (43%); egg (43%); fruit and vegetables (34%); seafood (13%); legumes (26%); oats (9%); turkey (4%). 39% had IgE mediated and 22% had non-IgE food allergies to other foods.
Seven hospital challenges were performed (30%): five negative; one inconclusive; one positive. 39% were offered home introduction, with 78% tolerating the index food (no significant symptoms with reactions). 30% were lost to follow-up. Mean discharge age was 35 months.
**Conclusions:** The majority presented with severe symptoms, with identified triggers consistent with UK data. Significant delays between first episode and allergy clinic review highlight an education and service need. Additional food triggers should be considered after one episode. Home introduction may be suitable for selected patients.
No external funding received.

### A076 | Palforzia: Managing peanut oral immunotherapy, co-morbidities and risk of anaphylaxis

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**Objectives:** *Background*: Palforzia is a NICE-approved NHS treatment used for oral desensitisation in peanut-allergic individuals.

Here we present 2 children who participated in the Aimmune sponsored research in peanut oral immunotherapy (POIT) using AR101 for 6 years before transition to Palforzia earlier this year. Both these children had reacted to less than a peanut amount when screened for recruitment. They had both received adrenaline for anaphylaxis during the study period and are well practised in recognising and managing anaphylaxis.

**Method:** *Case Presentation*: Case 1, a 12-year-old girl with peanut allergy, asthma, and allergic rhinitis, on treatment for the latter 2 comorbidities for 2 years. In May this year, 3 h after taking Palforzia, in bed, she choked on her oral secretions during the hypnagogic state with a vigorous bout of cough. This was treated with intramuscular adrenaline.

Case 2, a 12-year-old boy, with peanut allergy, asthma and rhinitis also receiving Palforzia, started sneezing, coughing and had difficulty in breathing during football training on freshly mowed grass. This was 4 h after taking Palforzia in May this year.

**Results and Discussion:** Palforzia is unlikely to have caused anaphylaxis. They continue to receive maintenance dose. The incidents occurred during elevated pollen count, which our patients are sensitised to. Their compliance with treatments for rhinitis was sub-optimal. It can be difficult to distinguish evolving symptoms of anaphylaxis from asthma with co-existent rhinitis.

**Conclusions:** These cases highlight the possible changing landscape of use of adrenaline in patients on POIT. Suitability to continue treatment for POIT in such cases is complex and multifaceted. Compliance with treatments for asthma and rhinitis is a challenge as is observing exertion, hot showers, intercurrent viral illness and precise POIT dosing instructions. A considered dialogue for on-going optimisation is required.

## A077 | Initiation of palforzia peanut oral immunotherapy in a tertiary centre: Case review of the first 10 patients

Noorah Al Mulhem[1,2]; Rebecca Batt[1]; Katherine Knight[1]; Prabalini Thaventhiran[1]; MaryJohanna Fogarty[1]; Elizabeth Powell[1]; Ru-Xin Foong[1,3]

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**Objectives:** The aim of this study was to describe the initial experience of commencing the NICE-approved peanut oral immunotherapy Palforzia in our NHS service at Evelina Children's Hospital (ECH).

**Method:** This was a retrospective study conducted at ECH between September 2022 and June 2023. Patients were started on Palforzia periodically from September 2022 onwards. Data on patient clinical characteristics, previous test results, the time taken to reach maintenance, reactions to doses and co-factors linked to reactions were collected.

**Results:** Ten patients (4 males, 6 females), aged 9–14 years old, were started on Palforzia as per manufacturer's protocol and were included in this analysis. Their median specific peanut IgE was (90.95 kUA/L), peanut Ara h2 (62.75 kUA/L), and peanut SPT (7 mm). To this date, six patients have reached 300 mg maintenance dose in a median of 143.5 days (4.7 months), (minimum 141 days–maximum 171 days). Of these six patients, five remain on maintenance, but one had to undergo down dosing due to an asthma exacerbation followed by a varicella infection and is currently re-updosing. One patient developed anaphylaxis after being on maintenance dose for 55 days (1.8 months) caused by exposure to co-factors (viral illness and exercise). Of the remaining four patients that have not reached maintenance yet, two have had no reactions on up-dosing but two have had gastrointestinal side effects. One has also had co-factor related anaphylaxis.

**Conclusions:** Palforzia is well tolerated by most patients taking around 143 days to reach maintenance. Anaphylaxis can occur in relation to co-factors; therefore, ongoing patient education is paramount.

## A078 | Does asthma status impact outcomes in food allergen immunotherapy?

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**Objectives:** Concomitant asthma may be a potential risk factor for more severe reactions in food allergy, although a recent meta-analysis found no link between well-controlled asthma and reaction severity at food challenge. Asthma can be a relative contraindication to oral immunotherapy (OIT) in food allergy, but limited data exists regarding asthma status and OIT outcomes including safety. We therefore looked at the impact of asthma on outcomes in children undergoing OIT for peanut and cow's milk (CM) allergy.

**Method:** Post hoc analysis of data from two clinical trials: the BOPI study (NCT02149719) randomised 47 children (8–17 years, 68% asthma) to peanut-OIT, the SOCMA study (NCT02216175) randomised 68 children (6–17 years, 63% asthma) to CM-OIT. Asthma status was determined according to ICON consensus in conjunction with clinical assessment which included lung function. Both studies excluded individuals with poorly controlled asthma (according to ICON consensus) or need for oral corticosteroids in the preceding 3 months.

**Results:** There was no evidence that asthma status impacted efficacy in either trial. In terms of adverse events (AEs), no association was seen in SOCMA (OR 1.1 [95% CI 0.95–1.2] while in BOPI, asthma was associated with a lower rate of AEs (of any severity) (OR 0.59 (0.51–0.67). No association was seen with respect to number of OIT doses associated with anaphylaxis in BOPI (OR 0.63 [0.27–1.5])

or SOMCA (OR 1.7 [0.9–3.3]). Similarly, there was no association between asthma status and participants experiencing multiple anaphylaxis events (BOPI: OR 0.93 [0.15–5.7]; SOCMA OR 5.5 [0.6–47]) although due to small numbers, confidence intervals are wide. There was no association seen between asthma status and study withdrawals.

**Conclusions:** We did not identify any evidence to suggest that well-controlled asthma adversely impacts on safety of OIT. Nonetheless, there is a clear need for this to be assessed using multiple studies via a formal meta-analysis.

### A079 | Desensitisation in cow's milk-allergic children using oral immunotherapy (OIT) with sublingual OIT pre-treatment: Results from the SOCMA study

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**Objectives:** Oral immunotherapy (OIT) for cow's milk (CM) allergy is effective but associated with a high rate of adverse events compared to OIT for other food allergens. Sublingual immunotherapy (SLIT) also induces a degree of desensitisation, but to a lower level than that seen with OIT. In a novel Phase 2b/3 randomised controlled trial, we assessed if SLIT pre-treatment prior to OIT can optimise desensitisation.

**Method:** Children with CM-allergy confirmed at double-blind, placebo-controlled food challenge (DBPCFC) were randomised to pre-treatment with either SLIT or OIT (using the same dose) or placebo for 6 months. All subjects then underwent conventional CM-OIT for a further 6 months. Participants underwent repeat DBPCFC at 6 and 12 months to assess response. Clinicaltrials.gov NCT02216175.

**Results:** Sixty-eight children (6–18 years, 43% female) were enrolled. Baseline median SPT 7 mm (IQR 5–9 mm), sIgE to CM 19 kUA/L (IQR 4–59 kUA/L). Median maximum tolerated dose (MTD) at baseline was 44 mg CM protein (IQR 14–144 mg). After 6 months of pre-treatment, this increased to 444 mg CM-protein (13 mL milk) with SLIT and 144 mg in those receiving the same dose as OIT (4.8 mL of milk) ($p = 0.04$). There was no significant change in MTD in the placebo arm. After a further 6 months of OIT, median MTD increased to 4444 mg (130 mL milk) in all groups. Significant, OIT-related reactions occurred at a rate of 1.1% in those receiving SLIT pre-treatment, compared with >2.5% in the other groups.

**Conclusions:** SLIT pre-treatment was more effective than OIT using the same dosing protocol and had a favourable safety profile.

### A080 | Barriers to completion of fresh milk oral immunotherapy in children on a home up-dosing protocol

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**Objectives:** *Background*: Milk oral immunotherapy (MOIT) began at Evelina London Children's Hospital (ELCH) Allergy Service in February 2021, to offer patients with persisting milk allergy the opportunity to build tolerance to a defined amount of fresh cow's milk, thus reducing the risk of life-threatening reactions from accidental exposure.

Twenty-two children (age range 6–15 year, mean age 11.5, median age 11.7) have commenced MOIT using a 68 day home up-dosing protocol. This case demonstrates several challenges encountered in our population of highly milk allergic, multi-atopic patients.

**Method:** *Case Presentation*: Patient A, 13.5 year, took 207 days to complete up-dosing; progress delayed by four mild reactions (nausea, hives, lip swelling, oral irritation) and two bouts of illness. He had anaphylaxis 1 h post initial top dose (250 mL) after running up four flights of stairs. Despite reducing to 180 mL he experienced another anaphylaxis due to concurrent otitis media without additional dose adjustment. Recurrent illness reduced the dose further. Anxiety about up-dosing set in. Traumatic life events reduced motivation to continue, and milk was stopped. 6 months later, patient A requested to re-start.

**Results and Discussion:** It is recognised that co-factors increase risk of reacting during MOIT, for example exercise, illness, asthma exacerbation, sleep deprivation, menstruation, hot baths. Patients are informed of these and given strategies to reduce the risk of reaction. Reactions are seen when patients do not follow the protocol, or under-report pre-existing atopy control prior to starting. In addition, patients negotiate different dosing on residential trips and holidays, underestimate the life commitment to MOIT, have difficulty calculating milk protein in composite or non-labelled foods and dislike the taste of milk. In person, fortnightly up-dosing might reduce co-factor related reactions but places additional demands on the NHS.

**Conclusions:** Successful immunotherapy is not guaranteed. There are many barriers, particularly for adolescents, during up-dosing which can impede or halt progression.

### A081 | Allergic reaction to cow's milk-based protein supplement in a child who is tolerant to cow's milk

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*John Radcliffe Hospital, Oxford, UK*

**Objectives:** *Background*: Cow's milk protein allergy is most prevalent during infancy and early childhood. Here, we are describing a child

who is tolerant to cow's milk presenting with an allergic reaction to cow's milk-based protein supplement.

**Method:** *Case Presentation*: A 12-year-old boy had an Ig E-mediated milk allergy. He passed oral challenge to baked milk and then successfully went through milk desensitization. Currently, he can consume milk liberally. He presented with an unexplained urticarial reaction after eating a cow's milk-based protein supplement (Oreo protein bar). In the background, he has nut allergy, asthma, eczema and allergic rhinitis. The Ig E level for cow's milk protein was 15.8 kUA/L and Ig E for A-Lactalbumin, B-Lactalbumin and casein were respectively 6.46, 2.3 and 16.1, which were done in 2019. The latest cow's milk protein components are pending.

**Results and Discussion:** The Oreo protein bar contains 35 g of protein and most of it is derived from cow's milk. Cow's milk has 3 g pf protein per 100 mLs and the protein bar contained the same amount of protein as 1 L of cow's milk thus exceeding the threshold of cow's milk protein that he could tolerate is the possible explanation for the above presentation. He was advised not to use any cow's milk-based protein supplements in the future. As he could tolerate fresh cow's milk, the advice was to continue including this as part of his diet.

**Conclusion:** We recommend that if an individual has had desensitization for cow's milk protein allergy and successfully outgrown from milk allergy to be cautious when consuming cow's milk-based protein supplement.

## A082 | Anaphylactic reaction due to storage mites: Pancake syndrome

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*John Radcliffe Hospital, Oxford, UK*

**Objectives:** *Background*: Oral mite anaphylaxis (pancake syndrome) is a severe allergic reaction following the consumption of mite-contaminated wheat flour. It is commonly associated with pancakes and is prevalent in tropical/subtropical regions.

**Method:** *Case presentation*: A previously healthy 15-year-old girl presented with an anaphylactic reaction immediately after eating homemade pancakes containing wheat, buckwheat and additives. She had never shown any signs of allergies before, including to wheat. Skin prick tests were strongly positive for house dust mites (HDM), grass pollen and the pancake mixture. IgE level for buckwheat was normal and elevated to storage mite.

A 10-year-old boy with a history of allergic rhinoconjunctivitis had three episodes of unexplained anaphylaxis at ages five, six and seven. The last episode followed a homemade cake containing wheat flour. He generally consumes wheat without concern. Skin prick tests were positive for HDM, grass pollen, cat and dog dander. The Alex test indicated sensitization to HDM, storage mites, grass and tree pollen.

**Results and Discussion:** The diagnosis of storage mite allergy (pancake syndrome) can be made when allergic symptoms occur after consumption of foods contaminated with storage mite, lack of other allergen exposure and either positive skin prick test or IgE to storage mite. Analysis of the contaminated food under microscope might be able to identify the mite.

This condition is believed to be triggered by heat-resistant allergens present in contaminated flour with storage mites. Various mite species are found in the flour. The allergenic cross-reactivity between domestic and storage mite species may explain why people allergic to house dust mites experience systemic reactions when exposed to storage mites orally.

**Conclusion:** Pancake syndrome should be considered in children who experience a severe allergic reaction without a clear source.

## A083 | An apple a day keeps PFS symptoms away

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**Objectives:** Pollen food syndrome (PFS) is a common presentation in pollen-sensitised individuals. Pollen immunotherapy produces limited success in relieving PFS symptoms. Small studies demonstrate gradual desensitisation with increasing apple consumption in birch pollen allergic adults achieving induced tolerance.

**Method:** A 7-year-old girl presented with a history of worsening PFS symptoms. Initially, she experienced symptoms only to carrots and apples, but this extended to include all fresh fruit, al dente vegetables and various nuts.

ISAC panel showed Birch Bet v 1 53 kua/L; Grass Phl p 5 2.2 kua/L; and multiple PR10 proteins were positive including Mal d 1–25 kua/L; Pru p 1 10ISU-E, Cor a 1–17 kua/L, Ara h 8 – 16kua/L. There was no LTP sensitisation.

Apple oral immunotherapy (OIT) was offered due to her increasing dietary restrictions and reduced quality of life. This started with a Golden Delicious apple (used due to its high allergenicity) oral provocation test. Provocation doses were done without skin. An initial dose of 0.5 g provoked symptoms of mouth and throat tingling lasting 40 min. A second dose of 0.25 g provoked only mouth tingling lasting 25 min. Thus, an initial daily dose of 0.25 g without skin was recommended as the starting dose for OIT. Incremental up dosing at home initially incorporated skin; then doubling of dose from 0.25 g every 3 weeks, to a top dose of one apple (128 g). Dietetic support was available throughout.

**Results:** The patient successfully completed the OIT and can consume two Golden delicious apples. The whole family reported an improvement in quality of life.

**Conclusions:** This case illustrates OIT with apple in a PFS paediatric patient can achieve tolerance. It required minimal clinical input for a subsequent improvement in this patient's quality of life. Going forwards, we will collect formal quality of life data pre and post apple OIT.

### A084 | Two cases of lipid transfer protein allergy in a tertiary paediatric allergy centre

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**Objectives:** *Background*: LTP allergy is anecdotally increasingly common within paediatric allergy clinics which presents clinical challenges particularly for management. A variety of phenotypes exist with co-factors playing a role. We present two cases of LTP allergy.
**Method:** *Case presentation*: Case 1: A 16 year old with mild hay fever (March–August) ate a meal containing wheat ± nuts (all of which eaten regularly), which tasted 'odd'. He subsequently experienced facial swelling and redness, urticaria, rhinitis, shortness of breath (with wheeze) and a feeling of impending doom associated with exercise. Anaphylaxis improved after IM Adrenaline. Specific IgE to omega 5 gliadin was negative, SPT wheat 3 mm and sIgE wheat 28.8 KU/L. LTP components Tri a 14, Pru p 3, Ara h 9, Cor a 8 and Jug r 3 were 93.3, >100, 48, 39.1 and 52.7 KU/L, respectively. He was diagnosed with LTP allergy, advised to avoid wheat before and after exercise, to continue to eat tolerated foods including nuts. He was prescribed an adrenaline autoinjector (AAI) and oral antihistamine as required.
Case 2: A 14 year old with a swollen tongue and itchy throat after eating mixed nuts. Background of mild eczema only. Skin prick testing (SPT): peanut (2 mm), hazelnut (1 mm), pecan nut (7 mm) and walnut (5 mm). LTP components Ara h 9, Jug r 3 and Cor a 8 were 8.14, 4.98 and 2.27 KU/L, respectively. He was prescribed an AAI, oral antihistamine as required and advised to avoid nuts.
**Results and Discussion:** Due to the nature of LTP allergy, these patients are at risk of severe and unpredictable reactions. The management includes avoidance of food triggers, advice on cofactors and careful consideration of other LTP sensitised foods.
**Conclusions:** These two cases illustrate that LTP allergy has a heterogenous clinical presentation and requires an individualised approach to management with consideration given to dietary and lifestyle choices.

### A085 | Paediatric case of lipid transfer protein allergy

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**Objectives:** *Background*: Lipid transfer protein (LTP) allergy is characterised by sensitisation to proteins present in fruits, vegetables and nuts. In comparison to other plant-derived food allergies, like pollen food syndrome, LTP allergy tends to cause more severe reactions, to raw, cooked and processed foods. It has typically been implicated in adult Mediterranean populations but is an emerging disorder in children.
**Method:** *Case presentation*: An 8-year-old girl of black ethnic origin with multiple food allergies, eczema and allergic rhinoconjunctivitis was reviewed in allergy clinic. Food allergies include peanut, dairy, fish and more recently citrus fruits.
She has had two reactions to citrus fruits: rash, cough, hoarse voice and itchy chest after using a spoon stirred in lemon tea; cheek swelling, cough and altered voice after ingesting a citrus sweet. Due to the reaction severity, the differential included LTP allergy. Skin prick tests were 2 mm for lemon and 0 mm for lemon seed, lime and orange. Specific IgE (UI/ml) was 1.34 for lemon, 0.23 for lime, 0.52 for peach LTP (Pru p 3), 0.39 for peanut LTP (Ara h 9) and 0.86 for birch PR-10 (Bet v 1).
**Results and Discussion**: Lemon allergy is uncommon and generally causes mild, localised reactions. A positive Pru p 3 in this case supports an LTP allergy diagnosis as Cit I 1, a lemon-associated LTP, has demonstrated cross-reactivity with Pru p 3. Co-sensitisation between Ara h 9 and Bet v 1 with Pru p 3 has also been observed.
LTP allergy is increasingly being recognised as a significant food allergy in children. A high degree of cross-reactivity between LTPs and heterogeneous disease patterns means severe reactions can be unpredictable. Early diagnosis, strict food avoidance, appropriate medications and regular follow-up is important to avoid future reactions.
**Conclusions:** LTP allergy should be considered in children with severe allergic reactions to plant-derived foods.

## ALLIED HEALTH PROFESSIONAL

### A086 | Understanding the goals and concerns of young people embarking on oral immunotherapy for food allergies: A qualitative study

Clare Jackson[1]; Dipal Sangani[1]; Sarah Burrell[1]; Sharanya Nagendran[2]; Magdalena Marcell[1]; Ladan Ali[1]; Bettina Duca[2]; Nandinee Patel[1]; Paul J Turner[2]
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**Objectives:** There is limited data, primarily from the USA, reporting the motivations of families who undertake oral food immunotherapy (OIT). We sought to collate the views of young people (YP) in the UK considering OIT for peanut or cow's milk allergy within research trials.
**Method:** YP undertaking screening assessments prior to commencing OIT to cow's milk (SOCMA trial) or peanut (BOPI or BOPI-2 trials) were asked the following questions via paper or electronic survey: 'What do you think will be the main benefits of immunotherapy for you?', 'What do you think will be the main problems of immunotherapy for you?'
Qualitative, content-analysis was undertaken of responses from YP and their parents. All participants provided written consent.
**Results:** Ninety-nine YP with peanut allergy (58% male, median age 14 (R: 11–18) years and 21 with cow's milk allergy (47% male, median

age 15 (R: 12–17) years were surveyed, with additional responses from 1 or both parents.

Irrespective of allergen, although over 10% of responses reflected a desire for improved safety and reduced allergy-related risk, more commonly goals included a desire to expand the diet (over 25%) or increase dietary and social freedoms (over 25%). The commonest concerns of YP related to risks of allergic reaction during OIT (over 25%). However, other concerns included worries about missing school (1/5 responses), time commitments and rescheduling daily routines (1/4 responses) or treatment failure (almost 10%).

No significant new goals or concerns were reported following completion of a baseline food challenge compared to responses before challenge.

**Conclusions:** YP have an array of reasons for undertaking OIT. They also demonstrate significant awareness of potential physical and psychological pitfalls of treatment. YP must be included in the shared decision-making process prior to commencing OIT, to ensure their expectations align with what is achievable through treatment and their concerns are addressed.

### A087 | Reflections on peanut immunotherapy: Thematic analysis of young people and their families

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**Objectives:** The objective of the study was to explore the views of UK-based participants and their parents reflecting on their experience of peanut oral immunotherapy (OIT) in the research setting.

**Method:** Semi-structured group interviews were conducted with young people (and/or their parents) who had completed roasted peanut-OIT (in some, induction also involved ~6 months of induction with boiled peanut) or participants who commenced OIT but stopped due to adverse events. Trial researchers and independent external clinicians conducted interviews, and the transcripts were reviewed using thematic analysis. All subjects provided informed consent.

**Results:** Eleven young people (5 female, 6 male), aged 10–22 (mean 15) years, and 22 parents were interviewed during 8 focus groups (11 families continued on OIT, 4 had stopped between 1 month and <5 years after commencing OIT).

Participants reported increased knowledge of their allergy and patterns of reaction, increased confidence and competence in allergy management (including symptom self-management), increased dietary and social freedoms and reduced fear of self-injection with adrenaline as key achievements of OIT. Parents commented on the value of both clinical and 'psychological' desensitisation with peanut-OIT.

Both groups reflected on OIT being a long journey with ups and downs and highlighted the importance of clear and honest communication about expectations and practicalities prior to starting OIT.

Most participants commented on the challenge of longer-term maintenance dosing when they disliked the taste of peanut so much, in order to achieve the above outcomes.

**Conclusions:** Individual experiences of OIT vary significantly. Key outcomes of gaining knowledge, increasing self-confidence and achieving dietary freedom are closely linked to the level of two-way communication and support provided for their physical and psychological needs during the long treatment process. Communication with the young person as part of shared decision-making is essential. Much of this was engrained through the supportive environment provided by staff during baseline food challenges prior to OIT.

### A088 | Evaluation of a specialised allergy pharmacist-led sublingual immunotherapy clinic, utilised during the COVID-19 pandemic

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**Objectives:** Demand for hospital-based specialist treatment outweighs its supply. Sublingual allergen immunotherapy (SLIT) has become increasingly used and reduces the need to access hospital sites. Allied health professionals (AHPs) are also critical to new models of care in meeting increased demand. We implemented the first-ever specialised pharmacist-led SLIT clinic in the United Kingdom.

**Method:** A SLIT service was present in our Trust from 2008, with test doses and quality of life (QOL) scoring. However, the monitoring pathway was unstandardised with reviews undertaken by a mixture of medical and nursing staff.

A dedicated specialised allergy pharmacist SLIT service was being developed but then expanded through urgent need during the COVID-19 pandemic.

An end of season/annual review was conducted remotely by the pharmacist using a structured proforma and Juniper QOL questionnaire (adapted). Patients were presented at the multi-disciplinary team (MDT) meeting to confirm response and continuation (or not) of the treatment. Responders were routinely invited to come for a face-to-face appointment with the pharmacists to collect the medication, discuss adherence and check nasal spray technique.

**Results:** Ninety-two patients have been managed through the pharmacist-led pathway, including 6 converted from subcutaneous immunotherapy (SCIT) to SLIT due to the pandemic. No issues were identified during the switch. 19 of the patients have now successfully completed treatment and 61 ongoing. Seven patients were referred back to the consultant due to non-response. Treatment

was stopped for five patients due to non-adherence, intolerance or transfer of care to another Trust.

**Conclusions:** The pharmacist-led SLIT pathway has been successfully implemented in our Trust as a novel model of AHP-delivered allergy care. SCIT to SLIT conversion during the pandemic proved safe. Future plans include tools to support any non-adherence barriers, collection of patient satisfaction data and optimising how response is evaluated at the MDT meeting.

## A089 | Early introduction of cashew nut in sensitised children under 3 years old presenting with food allergy

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**Objectives:** As early introduction of peanut in atopic infants reduces the risk of developing allergy, assessment of peanut sensitisation (by allergy test and oral food challenge (OFC)) is now recommended in evaluation of young children presenting with egg allergy. In our clinic population, as we noted cashew nut allergy more commonly in south Asian children, we included assessment of cashew sensitisation in initial evaluations in young children presenting with food allergy. We reviewed our experience with this approach.

**Method:** Children <3 years old presenting with food allergy and/or eczema were allergy assessed in clinic to the presenting foods and to peanut and cashew nut where these were not already in the child's diet; and where sensitised to cashew nut underwent OFCs to determine tolerance. Outcome of OFCs and subsequent cashew ingestion, where negative, was assessed.

**Results:** Since 2017, we conducted cashew paste OFCs in 48 children (37 < 18 months) in which 17 (35%) were positive; rate was not influenced by age of challenge or ethnicity. Allergic reactions were all mild to moderate. Further post-challenge assessments in 29 children who passed challenges (no data for 2) revealed early ingestion of cashew in 20 (70%); all but 2 continued ingestion safely. Five of the remaining 7 developed subsequent allergic reactions to cashew nut (1 family was non-compliant; 1 avoiding cashew nut as sibling was allergic).

**Conclusions:** Preliminary data of early cashew nut introduction suggests that, as with peanut introduction, subsequent allergy may be prevented in a high proportion of those not initially allergic. Furthermore, as symptoms in positive OFCs were mild to moderate, the approach is not only effective but also safe. The importance of early exposure with demonstrated safety raises the question as to whether introduction could not be conducted at home to avoid delays with waits for supervised challenges.

## A090 | Delayed symptoms post negative oral food challenges to nuts and seeds in children

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**Objectives:** The objective of the study was to determine frequency and nature of delayed allergic symptoms in the first 48 h post negative Oral Food Challenge (OFC) to nuts and seeds.

**Method:** We conducted an observational cross-sectional study using a structured telephone questionnaire in children who had a negative OFC to nuts and seeds between March and June 2022 in our centre to assess symptoms within 48 h post-OFC discharge.

**Results:** We identified 108 negative OFC in 87 patients. Mean age was 101.3 months (SD: 57.9). The foods tested were peanut ($n = 19$), almond ($n = 17$), hazelnut ($n = 16$), cashew ($n = 11$), sesame ($n = 10$), walnut ($n = 9$), brazil nut ($n = 9$), pistachio ($n = 8$), pine nut ($n = 5$), pecan ($n = 2$), macadamia ($n = 1$), mustard ($n = 1$). 81 (93%, 81/87) patients undergoing 102 OFCs could be contacted, and questionnaires completed. Only 2 patients (2%, 2/102) reported delayed mild and largely subjective symptoms within 48 h from discharge;(one with stomach pain and nausea, another with itchy facial rash), leading to inconclusive outcomes.

**Conclusions:** Frequency of delayed symptoms to nuts and seeds within 48 h post-discharge in negative OFC is very low. Offering 2 consecutive OFC to nuts and seeds in 1 day might be a feasible, resource-efficient approach to conducting OFC to nuts and seeds in children. Most parents interviewed were interested in this innovative approach to reduce time off school, work and travel costs.

## A091 | Supporting parents to enable selective nut eating in children with nut allergy

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*Whittington Health NHS Trust, London, UK*

**Objectives:** Recommendation for children with nut allergy has changed and allergy teams are advising selective nut eating (SNE). Although there is growing evidence in primary allergy prevention to support facilitation of SNE, this advice can be confusing, causing difficulties to some especially in identifying different types of nuts. Our multi-disciplinary team (MDT) set out to improve written information on SNE for paediatric patients with nut/s allergy.

**Method:** A new SNE visual friendly material was created with consultation of the MDT allergy. 13 parents/carers of children with nut/s allergy attending our allergy service took part in a survey exploring their opinion on this material. The survey contained eight questions and opportunity for free text comments.

**Results:** 100% of parents/carers indicated the new SNE document was easy to understand and follow versus 69% with the current nut avoidance booklet (NAB). 100% of parents/carers were able to identify different types of nuts using the SNE document versus 77% when using the NAB. 100% of parents/carers could tell which nuts their children had to avoid/include/wait for a challenge looking at the SNE document compared to 54% when looking at the NAB. 69% of parents/carers felt the SNE document had all the information required while 92% found that the NAB did.

**Conclusions:** Parents/carers were more confident with SNE advice with the visual friendly material ('The document is clear and easy to follow, I will stick it on my fridge'.). However, most of them found that more detailed information as available in the NAB was important ('I like having information about what foods can contain nuts as in the booklet'.). Therefore, we are planning to use the new SNE document as a complement to the existing NAB offering patients choices and ensure their needs are met.

### A092 | What are the food allergy myth beliefs of non-allergy specialist paediatric HCPs working in a tertiary level paediatric hospital in Ireland

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**Objectives:** Food Allergy (FA) myths are widely circulating, fundamental mistruths about risk of food allergic reactions, treatment and outcomes. Research shows maternal agreement of FA myths is high. On accessing everyday health care, food allergic families interact with non-allergy specialist healthcare professionals (HCPs). These encounters may still contain discussions on FA management. All clinical opinions provided by HCPs impact strongly on parental behaviour. It is important, therefore, to establish belief levels in FA myths among non-allergy specialist HCPs to guide future education.

**Method:** An anonymous staff survey was conducted across Children's Health Ireland in 2022. HCPs that do not work in services specialising in FA were invited to share their agreement with 13 FA statements. Information on contributors including professional role, contact with known food allergic patients, and if friends and family members have FA, were also collected.

**Results:** 496 participants completed the survey. 36.5% were nurses, 23.9% were students, 7.7% consultant paediatricians, 6.3% NCHD, 25.3% were HSCP, including dietitians and pharmacists. 22% of participants have a child family member with a FA and 47% have a friend with a child with FA. 67% reported that they were in contact with FA patients, while they work.

Results show an overall agreement with myth statements of 38.6% with a further 15.4% of participants being 'unsure'. The FA myths with greatest agreement were 'anaphylaxis is often fatal' -69.1% and 'nut allergy can be airborne'- 59.6%. The factual statement regarding early introduction of peanut as a means of preventing peanut allergy was agreed to by 54.6% of HCPs.

**Conclusions:** The study uncovers a variable belief in FA myth among frontline HCPs in a tertiary paediatric centre that may further impair quality of life for FA families. It will be important to utilise the survey results to help target content for FA awareness and education for HCPs.

### A093 | Understanding the needs of children and young people with food hypersensitivities: A qualitative study

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**Objectives:** Research has highlighted the psychosocial impact of living with food hypersensitivities (FHS) on children and young people (CYP). However, there is a paucity of qualitative data from CYP themselves in terms of the support they would like to improve their psychological well-being. The aim of the present study was to further understand the experiences of CYP with FHS in the United Kingdom, including the challenges they face, to inform structural changes in how they are supported.

**Method:** CYP aged 8–17 years were recruited with self-reported food allergy or coeliac disease and asked about their experiences of living with, and the psychological impact of FHS, through online, semi-structured interviews. Interviews were transcribed verbatim, and data were analysed using reflexive thematic analysis.

**Results:** Twenty-five CYP participated in interviews. Three themes were generated which addressed an aspect of change that CYP felt would enable support and improve their well-being: desire to feel heard, need for control and appreciation of the severity of their FHS.

**Conclusions:** This is the first study to investigate what CYP with FHS would find beneficial for their wellbeing with recommendations provided as to how these may be implemented these across various systems. This includes health professionals being more aware of the psychosocial impact from diagnosis, schools being more open and consistent with FHS management strategies, and friends being educated on the management of FHS.

## A094 | National survey of psychology provision for children and adults with food allergy in the UK

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**Objectives:** Food allergies (FA) in the United Kingdom have a substantial impact on quality of life and mental health. This study aimed to assess the level of provision of psychology services for children and adults with FA across the United Kingdom and explore healthcare professionals (HCP) views of these services.
**Method:** HCPs working in the UK National Health Service (NHS) with children, young people and/or adults with FA were invited to participate in an online survey for either allied health professionals (AHPs) and clinicians, or for psychologists.
**Results:** Surveys were completed by 130 AHPs/clinicians and 34 psychologists. On average psychologists were contracted to work 6 h per week with FA. CBT was the main service provided (64.7%), 91.2% reported anxiety the commonest reason for referral and 82.4% stated funding was the biggest barrier to further services. 46 per cent of AHPs and clinicians said they had no available psychology service. Of those that could, most referred only 1–4 patients in the last 6 months but stated they would like to refer significantly more (15+) ($Chi^2(3) = 49.67$, $p < 0.001$). AHPs would refer significantly more than clinicians ($Chi^2(3) = 49.67$, $p < 0.001$). Anxiety was the main reason for referrals (96.2%). On a scale of 1–5, there was strong agreement that there were unaddressed mental health needs (psychologists: mean = 4.32, SD = 0.84; AHPs/clinicians mean = 4.38 SD = 0.97). Psychologists strongly agreed that increasing funding or access would help preventative therapy (mean = 4.53, SD = 0.79). AHPs and clinicians strongly agreed that psychological input is useful (mean = 4.35, SD = 0.94).
**Conclusions:** This survey provides an indication of the scale of the unmet need for psychological services for FA. Although there was agreement that psychology services are important, there are a lack of services nationwide, hampering preventative therapy. More funding is needed to ensure help is provided for patients and families.

## A095 | Psychology support for north east paediatric allergy services: The unmet need

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**Objectives:** In the United Kingdom, allergies affect around 40% of children and young adults (CYA), and their families. If not handled effectively, allergies can cause serious reactions and may lead to fatal anaphylaxis. This can have a negative impact upon the mental health with increased levels of anxiety, depression and post-traumatic stress. This study's main objective was to review regional and local tier systems in accessing psychological support for paediatric allergies (2016–2023). Local hospital inclusion criteria explored what diseases, and their complexity, commonly presented to the service for support.
**Method:** Service data was analysed by aligning each patient against the referral inclusion criteria, and their code for 'unmet need' proposed.
**Results:** Results found a total of 153 referrals, of which 114 (74.51%) were excluded as unfunded, leaving 39 (25.49%) referrals included in final analysis. Of the latter, 34 (87.18%) referrals accepted, 3 (7.69%) declined and two required further information (5.13%). Three age group domains (infancy, childhood and adolescent) with varying degrees of severity and complexity of allergic disease were presented. Psychological impacts from allergies included: anxiety (22 (56.41%)), dysfunctional eating (5 (12.82%)), anger/mood (2 (5.12%)), adjustment/coping (9 (23.07%)) and behavioural management (1 (2.56%)) many can be supported by nurse specialists.
**Conclusions:** Local referral criteria, while aligned to the national tier system, brings further restrictions for CYA to access psychological support. Psychological care for patients with less complex issues could be delivered by trained nurse specialists to reduce referrals and thus a novel revised tier system is proposed. Identifying which diseases are common, along with concurrent psychological problems can act as a baseline for specialist nurse training in psychological support. In summary, the results, in a phase of limited funding and expertise, clearly dictate a need for specialist psychological support in paediatric allergic disease, directly or indirectly supported via specialist allergy nurse training.

## A096 | The unmet psychological support needs of caring for a child with food allergy: Experiences of caregivers in the UK taking part in the GAPS study

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**Objectives:** Many caregivers of children with food allergy (FA) report distress related to their child's FA; however, there is a big

discrepancy between the need for psychological support and available services. As part of the Global Access to Psychological Services for Food Allergy (GAPS) study, we assessed caregivers' experiences with healthcare services and their FA-related psychological support needs. We report here on results of the data from the United Kingdom.

**Method:** Participants were 14 parents of children with medically diagnosed FA living in the United Kingdom, recruited through patient organisations. Parents were interviewed using a semi-structured interview guide. All interviews were recorded, transcribed verbatim and analysed using template analysis.

**Results:** Four themes were identified: getting past the gatekeeper; a holistic approach to healthcare; the benefits of psychological support; accessing help outside of health care. Parents felt their concerns and worry regarding their child was not taken seriously by GPs in primary care and it was often difficult to get past this 'gatekeeper' to be referred to allergy services. Some parents turned to private practice to get help. Parents were often unable to access psychological support and felt that psychological support services should be integrated into the suite of healthcare professionals available at allergy clinics. Some parents did not know how psychological support could help them, however those who had been referred to a psychologist felt that it helped reduce anxieties. Finally, parents discussed means of support they would find helpful, including online support and resources so they could share experiences with peers and get help with learning more about food allergy and how to manage it.

**Conclusions:** Parents in the United Kingdom would benefit from easier access to allergy services and psychological support to ensure a more holistic person-centred approach to their healthcare. Online resources and support may be beneficial to help with FA-management.

## A097 | Management of food-allergic secondary school students at risk of anaphylaxis: A local population study

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**Objectives:** The aim of this study was to establish how food-allergic students at risk of anaphylaxis are managed in local secondary schools as reported by Special Educational Needs Co-ordinators (SENCo's) and investigate what they feel would help to manage food-allergic students in school.

**Method:** Using a purposive sampling strategy, 50 SENCo's representing 46 secondary schools in 3 London Boroughs were invited by email to participate in an anonymous, self-completion web-based survey regarding their school's management of food-allergic pupils. Their responses were measured against allergy/anaphylaxis best practice guidelines for schools. Content analysis was used to analyse SENCo's free-text responses.

**Results:** Responses were received from 44% of SENCo's, representing 22 secondary schools in 3 London Boroughs.

- 32% reported the absence of a school allergy/anaphylaxis policy and non-compliance with annual allergy/anaphylaxis training.
- Only 50% reported school allergy training that included allergen avoidance.
- 20% reported that none of their food-allergic students had allergy action plans in school.
- Over half of food-allergic students with adrenaline pens in school did not have an allergy action plan.
- The most frequently cited responses in the qualitative data were a) the need for allergy and anaphylaxis information and training for school staff. b) education for students, creating a culture of allergy awareness and peer support among the whole school community

**Conclusions:** Data indicate that school's management of food-allergic students is inadequate in several key areas evidenced to reduce the risk of anaphylaxis at school: school allergy policy, compliance with annual training and the presence of allergy action plans, particularly for students with Adrenaline pens.

Schools recognise the need for more allergy and anaphylaxis education and training for both staff and students. The results emphasise the need for a national standardised approach to school allergy policy, training and emergency medication and allergy action plans at school.

## A098 | A digitally enabled service for management of non-IgE CMA supports quicker access to a dietitian and reduces referrals to secondary care

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**Objectives:** The management of non-IgE cow's milk allergy (CMA) imposes a burden on primary and secondary care NHS resources.

The objective of this study was to compare infants referred to either a remote digitally enabled dietitian-led clinic (Oviva service) or to a traditional dietetic service to identify the number of infants accessing A&E and/or referred to secondary care and waiting times to see a dietitian.

**Method:** Specialist dietitians completed searches of GP systems for patients prescribed hypoallergenic formula with documented dietitian input.

Data were collected and compared on whether the GP made a referral to dietetics and/or secondary care, number of A&E attendances and wait times for dietitian appointments. The *t*-test and chi-squared were used for comparisons.

**Results:** 356 patient records were reviewed in a single Integrated Care System. 244 patients were under care of acute/community dietetic services and 112 patients were under care of Oviva.

The waiting time to see a dietitian was significantly shorter to see the Oviva dietitian (18 compared to 71 days $p = <0.001$).
Significantly fewer babies were referred to secondary care if referred to the Oviva service, 19.3% versus 49.2% ($p = <0.001$). There were fewer A&E attendances, 0.41 compared to 0.84 visits ($p = <0.001$).
Prior to the Oviva service being available, 55% of referrals to a dietitian were made directly by the GP suggesting the remaining 45% accessed dietetic support via secondary care.
**Conclusions:** Availability of a digitally enabled dietetic service results in more timely access to dietetics and less need for secondary care input. This will also have a positive impact on primary care and emergency services by reducing the burden of managing allergy related symptoms while waiting for specialist review.
A limitation of this study is the data sampling period allowing for a relatively small number of Oviva patients to be analysed.

## A099 | Patient and public involvement: Driving cow's milk protein allergy services and research forward

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**Objectives:** Public patient involvement (PPI) can promote the development of health services and research in cow's milk protein allergy (CMPA). CMPA poses high healthcare burden. Collaborative working to co-produce healthcare studies offers unique insight into service users' perspectives and ideas.
Aims were to explore the experiences of parents of infants with CMPA and highlight themes to support and inform future research through PPI.
**Method:** An online workshop was conducted with parents from East Devon. They discussed their experiences with two researchers. Key research themes were identified from recording, transcript and field notes.
**Results:** Two mothers of infants with CMPA participated.
Key themes identified included: (1) emotional burden of CMPA; (2) primary care experience; (3) information seeking; (4) public perception of allergy; (5) experience with their Dietitian.

1. Anxiety of managing CMPA was strongly highlighted, particularly while waiting for specialist support. Participants did not wish for formal support of their mental health, but reflected on the potential of online or peer support groups
2. Participants felt their primary care professional's knowledge and confidence managing CMPA was poor. Awareness of the local dietetic-led service was inconsistent, which delayed referral to specialist services
3. Digital/online resources, including social media, were sporadically accessed. Different sources of information were used
4. Participants highlighted disparity of public allergy awareness between food allergens
5. Participants felt relief when under the care of a Specialist Dietitian.

**Conclusions:** PPI revealed valuable insight into these family's experiences. Future PPI should include greater diversity of participants.
Parents would value prompt specialist input to reduce anxiety and to access reliable information and support. Promotion of the local rapid access dietetic-led CMPA service is needed across primary care.
Future qualitative research may elicit other unmet needs. This could increase understanding to health care providers and other parents, to further drive research.

## A100 | Rapid access dietetic-led cow's milk protein allergy service in East Devon: An update

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**Objectives:** Cow's milk protein allergy (CMPA) affects 2%–3% of infants in the United Kingdom. The challenges of this caseload are well-documented.
Devon Integrated Care Board commissioned a dietetic-led CMPA service in East Devon to promote clinical management of CMPA; improve family experience; reduce utilisation of primary and secondary care services and optimise hypoallergenic formula prescribing.
**Method:** The service was designed to see patients <14 days from referral and offer follow-up. Outcomes from April 2021 to October 2022 were reviewed.
Service users and GPs were invited to feedback their experiences via questionnaire.
Operational data including referral to treatment time and number of appointments were collected.
Prescribing information of hypoallergenic formulas was obtained via OpenPrescribing.
**Results:** 97% of service users felt their expectations were met. Responding after a follow-up appointment (5) 80% reported they had not accessed other services in relation to CMPA since being under the dietetic team.
Of GPs (8): 87.5% were aware of the service; 100% were happy with the time it took for their patients to be seen; 83% who used the service felt it saved them time.
Patients suitable for dietetic-led rapid access clinic were seen on average in 3.5 days. 513 new and 934 follow-up consultations were provided.
Per listed patient aged 0–4: at service inception, East Devon spent £1.32, compared to the national median £1.43. In October 2022 East Devon spent £1.18 (−10%) compared to national median of £1.86 (+30%).

Dietetic supervision of formula fed infant re-challenges resulted in an estimated savings of at least £69,423.

Amino acid formula as a percentage of total prescribing reduced from 30% to 18% over the 18-month period while the national median increased from 34% to 35%.

**Conclusions:** The CMPA service is efficient and effective, exceeding specified outcomes.

Future developments should involve a Devon-wide collaborative service to promote and streamline care.

## A101 | Penicillin de-labelling: Experience of a nurse-led children's drug challenge service

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**Objectives:** Penicillin is frequently suspected in children, often following viral rashes where antibiotics have been prescribed. Although the history can suggest that allergy is unlikely (e.g. reaction after a number of doses; delayed reaction), without diagnostic confirmation patients are subsequently prescribed alternative antibiotics which have been implicated in associated increased costs and morbidity. Allergy de-labelling using drug provocation tests, now using a simplified single dose challenge, is therefore recommended.

**Method:** In our service penicillin allergy assessment (AA) has evolved from drug prick-to-prick testing followed by graded oral challenge to, in 2019, single supervised oral dose and subsequent 3 day course to assess for delayed reactions. Additionally, as this is considered a low-risk procedure, AAs are now nurse-led with consultant availability for support where needed. We have collected oral challenge data prospectively from 2008 and here compare outcomes (positive or negative challenge and symptoms and treatment needs where positive) before and after change in assessment method.

**Results:** We performed 208 penicillin AAs between April 2008 and May 2019, of which 13 were positive (6.3%), all with mild symptoms requiring either oral antihistamines only or no intervention. Since our practice change in June 2019, a further 97 AAs have been performed to date; 4 (4.1%) were positive, all also with mild allergic symptoms. The time taken to conduct the AAs consisting of SPT and graded exposure was on average 168 min whereas one-dose AAs took on average 80 min (based on negative tests).

**Conclusions:** Our experience with this shift in practice supports the recommendations of the BSACI penicillin de-labelling guideline to move away from allergy consultant led service. The further change to single oral dose challenge also creates time to increase activity and thereby further address delays to de-labelling. Lastly, this model broadens the practice scope of our specialist nurses.

## PRIMARY CARE

## A102 | General practice characteristics as potential determinants of cow's milk allergy overdiagnosis

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**Objectives:** Cow's milk allergy (CMA) affects approximately 1% of infants. Although recent studies have raised concerns regarding CMA overdiagnosis, practice-specific contributions to this issue remain unexplored. In the Barrier Enhancement for Eczema Prevention (BEEP) study, CMA misdiagnosis was well characterised. This study aims to explore the relationship between general practice characteristics and likelihood of CMA misdiagnosis within the BEEP cohort.

**Method:** Secondary analysis linked BEEP participants to their general practices. Practice-level prescribing data was derived from NHS Digital and NHS Business Service Authorities. We evaluated practice deprivation index, extracted from Fingertips Public Health data; and practice CMA guidelines, categorised using criteria based on a recent Delphi consensus study. CMA misdiagnosis was identified using parent questionnaire, formal allergy assessment and primary care record screening. Mann–Whitney *U*-tests and mixed-effects logistic regressions were carried out using SPSS.

**Results:** The BEEP cohort included 214/1394 (15%) participants with a parent-reported milk issue of whom 19/1394 (1%) had confirmed CMA. We identified 124/1375 (9%) with CMA misdiagnosis and 81/1375 (6%) with unnecessary low-allergy formula prescription on analysis of available primary care records, excluding confirmed CMA. We found an association between general practice low-allergy formula prescribing behaviour (litres per liveborn infant) in the year prior to the BEEP study and odds of participant CMA misdiagnosis. Adjusted odds ratios (95% confidence intervals) for each litre per infant increase in low-allergy formula prescribing were 1.03 (1.01–1.06) for parent-reported CMA misdiagnosis, 1.05 (1.01–1.08) for primary care record of CMA misdiagnosis and 1.06 (1.02–1.10) for unnecessary low-allergy formula prescription. Practice-level prescribing for adrenaline auto-injectors and reflux medications, practice deprivation index and local CMA guideline recommendations were not associated with CMA misdiagnosis.

**Conclusions:** There was a significant association between practice prescribing behaviours and CMA misdiagnosis within the BEEP cohort, suggesting practitioner behaviour may be an important determinant of CMA misdiagnosis.

## A103 | Time-trends, regional variation and associations of specialised formula prescribing in England

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**Objectives:** Formula-fed infants diagnosed with cow's milk allergy (CMA) are often prescribed specialised formula. CMA overdiagnosis is common and associated with unnecessary specialised formula prescription. We evaluated recent trends and regional variation in specialised formula prescribing in England and assessed potential risk factors for higher prescribing rates.

**Method:** Data on Clinical Commissioning Group (CCG) prescription rates for specialised formulas, antibiotics, anti-reflux medications and paediatric adrenaline auto-injectors were extracted from England's electronic prescription database (NHSBSA) using R. Potential risk factors for higher prescribing rates including local CMA guideline recommendations, CCG deprivation index and number of paediatric allergy consultants per local child population were also analysed. These factors were compared against CCG specialised formula prescription rates using a multivariate linear regression model.

**Results:** Specialised formula prescriptions increased from 8.3 to 12.5 million litres (12.4 to 21.0 litres per birth) between 2014 and 2022. CCG prescribing rate varied from 0.80 to 47.60 litres per birth in 2017–2019. A multivariate linear regression model demonstrated significant associations between specialised formula prescription rates and the prescriptions of adrenaline auto-injectors (β 0.11, $p < 0.01$), Gaviscon infant sachets (β 0.43, $p < 0.01$), and other infant or child anti-reflux medications (β 0.61, $p = 0.03$). A model including these three factors accounted for 50% of variation in CCG prescribing rates for specialised formula. Conversely, antibiotics prescriptions, deprivation, specific CCG guideline recommendations and paediatric allergy consultant numbers did not show significant associations with CCG specialised formula prescribing.

**Conclusions:** Unnecessary prescription of specialised formula continues to increase in England but varies significantly by region. Specialised formula prescribing is strongly associated with anti-reflux medication and auto-adrenaline injector prescribing at the CCG level, but not with antibiotic prescribing or deprivation. This suggests specific healthcare practitioner prescribing behaviours related to allergy and gastrointestinal symptoms may be important determinants of CMA overdiagnosis.

## A104 | Where does self-care stand in allergic rhinitis sufferers? A real-world assessment of patient experiences and primary care prescriptions in the UK

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**Objectives:** Understand allergic rhinitis (AR) patients' experience and journey, assess the volume of prescriptions in primary care in the context of clinical guidelines.

**Method:** Insights were collected across United Kingdom (Sept/Oct2022) through an Ipsos online survey of 200 allergic adults (18–81) and 300 parents of allergic children (0–15).

LPD, a longitudinal patient dataset from IQVIA of >3mill. de-identified patient electronic medical records, >750 GPs and 150 GP practices, showing all prescriptions issued for Intranasal Steroids (INS) and Antihistamines (AHS) for patients who have ever had a recorded diagnosis of Allergic/Other Rhinitis.

**Results:** Ipsos survey-sneezing, watery/itchy eyes and runny/itchy nose are among the most prominently experienced symptoms. When symptoms start, 71% adults and 73% parents of children will initially seek help from a medical professional. For those who sought support in the past year, GPs were the main port of call for patients (37% adults, 51% children), followed by NHS website (26% adults, 34% children) and pharmacists (26% adults, 31% children).

LPD-Among prescriptions issued for AHS/INS for AR, in the last 5 years, 41% prescriptions corresponded to INS while 59% corresponded to AHS. In AHS in the last year (MAT Nov2022), 1st-generation AH prescriptions were 74% and 11% for children aged 0–2 and 12–17 respectively and were 12% on average in the 18+ group. Chlorphenamine and Cetirizine were the most prescribed 1st/2nd generation AHS (87%, 57% respectively within respective AH generations) among 0–17 s.

**Conclusions:** Nasal symptoms appear among most bothersome. Evidence supports superiority of INS over AHS in relieving nasal congestion, aligned with clinical treatment guidelines. Still, a lower number of INS prescriptions are reported in the United Kingdom. Research suggest patients in the United Kingdom are familiar with available NHS resources to support management of AR. Additional education on self-management through treatment options available over the counter may have a positive impact by relieving some of the NHS burden.

## A105 | NICE guidelines CG 116–12 years on: Has it changed GP practice?

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**Objectives:** NICE Guidelines CG116 regarding food allergies in under 19 s was published in Feb 2011 and clearly sets out standards of history taking and referral. Our aim was to audit the quality of referrals from primary care regarding food allergies to a secondary allergy clinic to assess the appropriateness of the referral and if an adequate allergy focused history was obtained in accordance with the NICE guidelines[1].

**Method:** Retrospective Audit of referrals received over a 2-month period from 1/12/21 to 31/1/22. All referrals for food allergies (IgE/

non-IgE mediated) were included. Referrals for other allergic conditions not related to food allergies were excluded. A 12-point score was used to determine if an adequate allergy focused history was obtained. Appropriateness was assessed if reason for referral was in keeping with the criteria set out in the guidelines[1].

**Results:** 91 referrals were received during the time frame of 2 months, of which 72 (79%) met criteria for food allergy and were hence included in the audit. Only 53% of these referrals met criteria for referral to a secondary clinic. There was 0% which had a complete allergy focused history. 12.5% referrals covered >10/12 points while 34.7% referrals covered <6/12 points in obtaining an allergy focused history.

**Conclusions:** Though the guidance has been around for a decade, the audit highlighted the fact that most referrals do not have an adequate allergy focused history and approximately 47% referrals did not meet criteria for referral to secondary care. This could be due to lack of awareness of guidelines or availability of expertise, infrastructure and time in primary care. Increasing awareness by targeted education in primary care could lead to an improvement in the referral process which would help reduce burden in secondary care and decrease wait times for patients who need to be assessed by the specialist.

## A106 | Adrenaline auto-injector prescription in food-allergic individuals with a prior hospital presentation for anaphylaxis: an analysis of English Primary Care Data

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**Objectives:** National and international guidelines recommend prescription of adrenaline (preferably as an autoinjector (AAI) for self-injection) in patients with food allergy who have had previous anaphylaxis to a food allergen. We analysed United Kingdom prescribing for AAI and how this was associated with history of prior anaphylaxis.

**Method:** As of September 2018, the Clinical Practice Research Datalink (CPRD) Aurum data set included 7 million patients, representing around 13% of the English population. We applied two different strategies using food allergy diagnostic codes to define two patient cohorts, which we then further evaluated for AAI prescription or prior hospital presentation due to anaphylaxis.

**Results:** Data were analysed from 130,832 individual patient records (45% male; median age 19 years, IQR 4–34 years) with an eligible food allergy diagnostic code between 2008 and 2018. 30,911 (23.6%) had at least one AAI prescribed during this time. 3980 (3.0%) were coded as having had an unplanned hospital encounter due to anaphylaxis during the study period. Only 58% of these individuals (64% in children, 55% in adults) were prescribed AAI at least once, and 39% (50% in children, 32% in adults) had multiple (≥3) AAI prescriptions subsequently. Children were more likely to receive multiple AAI prescription than adults (OR 2.2, 95% CI 1.9–2.5, $p < 0.001$ chi-squared). Interestingly, the index of multiple deprivation (IMD) status (essentially a measure of poverty) did not impact on prescription rates.

**Conclusions:** In this national data set, 42% of patients with prior food-induced anaphylaxis are not subsequently prescribed AAI, and at least 61% do not receive ongoing AAI prescription. This is independent of local IMD status.

## A107 | The psychological impact on levels of anxiety and confidence to manage a severe allergic reaction on parents of a food allergic child

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**Objectives:** The purpose of this study was to survey parents to greater understand the personal psychological burden of having a food allergic child and to assess parental confidence to manage severe allergic reactions.

**Method:** 576 parents of children under 18 years responded to a parent of a child with allergy questionnaire produced by Allergy UK. Qualitative data was sourced from six focus groups which included 26 responses. Data were analysed using descriptive statistics and thematic analysis.

**Results:**

- 72% ($n = 383$) of respondents had a child with food allergy of which 68% ($n = 261$) had a child prescribed an adrenaline autoinjector (AAI), of those who responded yes, their child has an AAI, 61% were unsure or not confident in using an adrenaline auto injector in the case of a severe allergic reaction.
- Parents reported high levels of anxiety at social events outside the home, 54% were very or extremely anxious about their child having an allergic reaction when eating out and 46% of parents feel their child is isolated because of their allergies.
- 65% of parents felt that their child was discriminated against in a restaurant, because there nothing they could eat safely.
- Responses to avoiding social situations, not being taken seriously, feeling isolated and being bullied, were high among children prescribed AAIs. The words frightening (72%) and isolating (51%) were most used to describe their child's food allergy.

**Conclusions:** Data from the survey indicated that parent confidence was low in managing severe allergic reactions and anxiety was high especially in social situations and when eating out.

Food allergy has the potential to impact children and their families in all areas of their lives. Patient organisations have an important role to play in educating Health Care Professionals to better understand the psychosocial burden of food allergy.

## ALLERGY EDUCATION

### A108 | Assessing the use and perceived utility of British Society Allergy Clinical immunology nursing competencies in the United Kingdom allergy nurse specialist practice: A National E-Survey

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**Objectives:** The objective of the study was to assess utilisation and perceived utility of the British Society for Allergy and Clinical Immunology (BSACI) Nursing Competencies (BNC) in United Kingdom Allergy Nurse Specialists (ANS).
**Method:** As part of a nationwide role mapping project, an E-survey was circulated among ANS. Benchmarked against BNC, current roles and self-assessed confidence levels were collected and perspectives on roles and minimum training requirements (MTR) were captured.
**Results:** Of 74 nationwide respondents, 44 (59.45%) met eligibility criteria. BNC completion rates during ANS training showed: Band 5 s (3/5, 60.00%); Band 6 s (13/18, 72.22%); Band 7 s (13/15, 86.66%); Band 8a (3/4, 75.00%); small sample size in Band 8b (0/1) and Band 8c (1/1); only 42(56.75%) respondents provided role and MTR data.
Of 42 respondents, food allergy was relevant to all ANS roles. The suitability of BNC for training food allergy reviews, food/drug challenges and diagnostic allergy test training received median ratings of 5/7 and 33 (78.57%) considered BNC MTR for food allergy.
Respiratory allergy was relevant to 35(83.33%); BNC suitability rated 4/7 for asthma reviews and 3/7 for diagnostic respiratory tests training. Only 23 (54.70%) considered BNC MTR for respiratory allergy.
Skin allergy was relevant to 35 (83.33%); BNC suitability rated 5/7 for training. However, only 20 (47.69%) recommended BNC as MTR.
Nasal allergy was relevant to 39 (92.85%); BNC suitability rated 4/7 for nasal allergy reviews and immunotherapy practice training. Only 23 (54.70%) considered BNC MTR for nasal allergy.
30 (40.54%) were excluded for being non-nurses, working in inappropriate settings, encountering appropriate patients or demonstrated high dropout rates/false starts.
**Conclusions:** ANS widely utilise the BNC as MTR across banding and allergy domains. While generally suitable, updates are required. These data represent a small subset of collected data, and collaboration with other BSACI groups will further enhance BNC effectiveness/relevance in improving ANS allergy training.

### A109 | Teaching dietitians about cow's milk allergy (CMA) using the HACASE:ARC model

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**Objectives:** *Aims*: Infants with suspected non-IgE-mediated CMA comprise a large proportion of the outpatient caseload for paediatric dietitians. Specialist allergy dietitians are well-placed to upskill non-specialist colleagues; however, they often lack any training in designing and delivering education. Evidence-based practice is well-established within clinical roles; however, its use is often lacking in clinical teaching. The aim was to teach CMA effectively using a recognised educational framework for session design and delivery.
**Methods:** A 1-h virtual teaching session was developed and designed using the HACASE:ARC model. This model incorporates the key components for successful education: Hook, Aims & learning outcomes, Content, Assessment, Summary and Evaluation alongside Appraisal and Reflection, to Change and improve the teaching session if appropriate. It was delivered to seven general paediatric dietitians working in acute and community settings. Case-based learning was used to assess learners, including online interactive tools and group discussion. Participants evaluated the session online.
**Results:** By the end of the session 71% ($n = 5$) of learners demonstrated an ability to recognise different presentations of CMA, describe the diagnosis and formulate a dietary management plan. 29% ($n = 2$) did not complete the session in full and therefore achievement of learning outcomes could not be assessed. Students evaluated the session as having been useful for applying knowledge, enjoyable and relevant to clinical practice. On reflection, the session was enjoyable to deliver, the students were engaged, and the format provided an opportunity to apply knowledge in a safe environment.
**Conclusions:** NEXT STEPS:
HACASE:ARC was a simple and effective tool which, when applied alongside education learning theory, resulted in an engaging teaching session. The learning outcomes, content and assessment were constructively aligned, giving students sufficient opportunity to construct and demonstrate achievement of the learning outcomes. HACASE:ARC will be used as a template for future teaching sessions within the department.

## A110 | Webinar for parents on managing allergic reactions: Factors impacting attendance

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**Objectives:** *Aims*: Our paediatric allergy team implemented a webinar model to deliver supplementary training to families on the recognition and management of allergic reactions. This is offered to all patients who have been prescribed an adrenaline auto-injector. Registration and attendance are via email invite. However, not all invited families proceed to register and/or attend. We aimed to review the records of all invited patients to (1) define the proportion of those who registered, attended and did not attend and (2) identify factors which may have influenced attendance.

**Methods:** A retrospective review of all patients invited to the Allergy Training Webinar between May 2022 to January 2023 was carried out. The study population was identified via invitation and attendance records on the webinar platform (WebEx). Data were extracted on the following variables: age (months); visit type (new outpatient, review outpatient, oral food challenge); allergen category (nut, nut+milk, other, multiple); previous anaphylaxis history; recent anaphylaxis history (within 6 months); previous adrenaline administration; email domain.

**Results:** A total of 406 first-time invitations were sent. 142(35%) attended; 77 (19%) registered but did not attend and 264(65%) did not respond. Over 80% failed to respond to repeat invitations. 386 individual patients were represented with complete data available for 376. The median population age was 67.5 months (lower quartile 25, upper quartile 120). The median age for attenders was 56 months vs 76 for non-attenders ($p = 0.045$). Of those with a history of anaphylaxis, 29.3% attended vs 45.2% of those with no anaphylaxis history ($p = 0.01$). There were no significant differences between attenders and non-attender across the other collected variables.

**Conclusions:** Next Steps.

The webinar model is a time and resource-efficient method of patient education; however, attendance is a major barrier. A prospective survey could further identify barriers and inform methods to improve engagement and delivery.

## A111 | Being food smart: An evaluation of online education on food allergy management in adolescents and parents

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**Objectives:** *Aims*: The aim of the study was to assess the impact of an educational tool on the self-efficacy, knowledge and health-related quality of life (HRQL) of parents and children with food allergy (FA).

**Method:** Uncontrolled before-after intervention study. Parents and young people (age 13–18) with FA seen in an Allergy Clinic were invited. An educational video on FA was produced covering allergen avoidance, reactions identification and management (through a simulated scenario) and a balanced perception of risks (through an interview with an expert). Participation involved watching the video at their convenience and completing validated questionnaires on FA-self-efficacy (FASE), impact of FA on their Health-Related Quality of Life (FA-HRQL: FAQLQ-PF and -TF), FA-related knowledge and skills (unvalidated) and providing feedback in electronic format before, and 2 weeks after watching the educational video. Descriptive and comparative ('pre-post') analysis was done using appropriate tests.

**Results:** Nineteen parents and 1 young person watched the video and completed pre and post questionnaires after recruitment. No significant differences were found in any of the mean scores for self-efficacy, health-related quality of life, or parental knowledge and skills in managing FA. Only one item demonstrated a significant difference: the parent report of 'increased confidence in teaching others about their child's food allergy' ($p < 0.024$). Parents provided very positive formal feedback on the educational video describing it as very informative and helpful.

**Conclusions:** Next steps: The study found that an educational video for parents and children with FA did not improve knowledge, self-efficacy or FA-HRQL. The small sample size might have limited the ability to detect differences. Based on the very positive feedback from parents, a further study in a larger cohort, with better engagement of young people and assessed over a longer period should be conducted to further assess the usefulness of this simple intervention.

## A112 | The design, development and demonstration of a virtual patient in allergy education

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**Objectives:** *Aims*: Virtual Patients (VP's) are interactive digital teaching tools that are effective in teaching a topic to healthcare professionals (HCP) in the context of a clinical case. They can be used to

train learners in clinical decision-making from diagnosis, therapeutic decisions, to management options. Well-designed VP's promote deeper learning while allowing mistakes to be made in a safe environment. Here we present the design and development of an interactive VP for HCP's to identify infants at higher risk of food allergy and advise parents on the earlier introduction of the common allergens as an allergy prevention strategy.

**Method:** The VP was developed using PowerPoint which is a flexible software, accessible to teachers and learners in most healthcare settings. PowerPoint enables both learner self-directed and teacher-directed VPs to be created. Learning outcomes were designed to address the aim for teaching the topic and used Blooms taxonomy of educational objectives.

**Results:** A clinical scenario typically experienced in general paediatric dietetic clinic settings was used to provide realistic context to help learners reach their clinical decisions. Each learning outcome was tested by either multiple-choice questions or open free text questions. The clinical consequence and feedback were provided for each answer choice. To aid deeper learning, each answer was linked to additional learning resources from the medical evidence base which the learner was encouraged to review, enabling all key elements of clinical reasoning to be explored. The VP will be demonstrated during the BSACI showcase.

**Conclusions:**

Next Steps:

The VP demonstrated today will be disseminated through, for example the hospital trust, the Dietetic Food Allergy Specialist Group and the British Allergy Education Network of BSACI. VPs are a versatile, accessible, effective tool for teaching topics in a clinically realistic manner. They can be used as a standalone teaching tool or integrated into existing teaching.

### A113 | Responding to a new curriculum: Developing a regional training programme for immunology and allergy trainees, informed by educational theory

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**Objectives:** *Aims*: A new Allergy, Clinical and (Laboratory) Immunology (AC[L]I) trainee curriculum was implemented in August 2021 (1). Anticipating the potential impact on trainees' learning needs, we drew on Biggs' constructive alignment (2) to develop an existing regional training programme; the new programme was delivered from August 2021 to July 2022. Drivers for development included mapping learning opportunities to the new curriculum. Challenges included addressing the merge of two previously separate curricula while providing adequate preparation for postgraduate examinations yet to be aligned to the new curriculum.

**Method:** To address these challenges, learning needs were assessed via multiple qualitative methods for data triangulation. Trainee-perceived learning needs were sought using a 4-point email survey, disseminated to eligible trainees ($n = 25$) in April 2021. This underwent thematic analysis (3). Objective learning needs per the new curriculum were assessed by comparing the 2021 and previous 2015 curricula (4). These data informed a teaching programme, with individual sessions evaluated via an anonymised online questionnaire. Quantitative and qualitative questionnaire items were used, including a 5-point Likert scale to rate statements such as 'The session covered relevant parts of the curriculum'.

**Results:** Email survey responses (8%), as a measure of trainee-perceived learning needs, highlighted a requirement for more sessions on Allergy and effective exam preparation. Curricular gap analysis highlighted a relative deficit in Allergy and laboratory training. A programme of 42 sessions was created, maintaining high proportions of Allergy and laboratory sessions (15% and 19%, respectively) and increasing sessions on exam preparation (8% versus 0% previously). Programme evaluation showed 96% of delivered sessions with data ($n = 28$) covered relevant parts of the curriculum and met trainees' learning needs.

**Conclusions:** This work highlights the importance of using learning needs assessment to inform educational programme development, particularly following implementation of a new curriculum.

## PAEDIATRIC FOOD ALLERGY

### A114 | Breakthrough reaction during rapid drug desensitisation to rituximab

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**Objectives:** Rituximab is a monoclonal antibody which is known to be associated with IgE mediated and cytokine release reactions. Rapid drug desensitisation allows a temporary state of tolerance to allow administration of rituximab where there is an absolute need for this medication.

**Method:** We present a 15-year-old male who was treated with rituximab for steroid resistant nephrotic syndrome secondary to IgA nephropathy. He had tolerated previous courses but recently had had increasingly severe symptoms including urticaria, rhinitis, itchy eyes, hoarse voice and difficulty swallowing despite pre-medication and slower infusion rates. He had also reacted to Ofatumumab with similar symptoms.

Following referral to the allergy team, skin prick testing (10 mg/mL) and intradermal testing (0.1 and 1 mg/mL) to Rituximab were negative. Despite this, his history was consistent with an IgE mediated reaction to rituximab and given the severity of reactions, a plan was made for rapid drug desensitisation. A 12-step desensitisation protocol with 1:1 care was performed. Following pre-medication with

cetirizine, paracetamol and IV methylprednisolone, the initial stages of the infusion were completed without reaction. On the final step of the protocol, he developed urticaria and lip swelling. The infusion was stopped and IV chlorphenamine and hydrocortisone given. After 40 min, symptoms had resolved, and the infusion was recommenced at the last tolerated step and completed uneventfully. Mast cell tryptase levels were normal at the time of reaction, 2 h later and 24 h later. A modified protocol was developed for his next infusion.

**Results:** This patient presented with symptoms suggestive of IgE mediated reaction despite negative testing. While many rapid drug desensitisations proceed uneventfully, breakthrough reactions can occur and require a personalised approach.

**Conclusions:** Rapid drug desensitisation protocols can be used to treat patients at risk of hypersensitivity reactions to drugs. In this case it enabled a critical drug to be administered.

## A115 | Antibiotic electronic de-labelling in paediatric patients and improving communication of outcomes for clinical use in the UK

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**Objectives:** Paediatric drug allergy testing outcomes can be updated on the Electronic Patient Records (EPR) system at Oxford University Hospitals NHS Foundation Trust (OUH), as well as primary care electronic systems. After allergy testing, patients categorised as 'antibiotic allergy—highly unlikely' should have the correct electronic label (allergy de-labelling), allowing for target antibiotic prescribing. Allergy test outcomes that are not communicated effectively are not utilised, leading to inappropriate use of antibiotics and potential for failed treatments.

Our objectives were to investigate (a) percentage of correct electronic antibiotic allergy labels in hospital and GP records, (b) ascertain whether test outcomes were communicated and how this impacted subsequent prescribing.

**Method:** Paediatric patients with suspected antibiotic allergy underwent drug allergy testing at OUH. The outcomes of these tests were updated on EPR and relayed to the primary care team. The hospital EPR system, GP shared records/ Health Exchange Information, outcome letters and subsequent e-prescriptions were all screened and used for data extraction.

**Results:** The 128 paediatric patients (63 female, 64 male, median age 6.6 years) underwent testing over a 4-year period, between 2019 and 2022. Only 85% of these patients had the correct hospital EPR label and 67% had the correct GP allergy label, although 98% of test outcomes were communicated to primary care and parents via clinic letters. Following antibiotic allergy testing, 68% did not have an allergy and 48% of those patients required a course of antibiotics. Only 58% of the new prescriptions were the target antibiotic.

**Conclusions:** Hospital and GP practices do not consistently de-label paediatric patient records, rendering tests ineffectual. Correct EPR labels have an upward trend. Comparatively, correct GP allergy labels are more variable despite test outcomes being relayed. It is vital to explore more effective ways of communicating allergy test outcomes for electronic records, in order to impact antibiotic prescribing in children.

## A116 | An audit of the paediatric drug allergy clinic and drug challenges at the Evelina London Children's Allergy Service

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**Objectives:** Many children are labelled with drug allergies, particularly penicillin, but in the majority, the label can be removed following assessment allowing administration of first-line treatments. The Evelina Children's Allergy service has four telephone drug allergy clinics per month (both doctor and nurse-led) and a linked challenge service.

We sought to audit the paediatric drug allergy clinic and drug challenges to optimise the patient journey and subsequent communication to primary care, benchmarking against the NICE drug allergy guidance.

**Method:** We audited 49 patients seen in telephone drug clinics from March to May 2023, and drug challenges that took place from these patients and a subset of other challenges on the unit. Referral and clinic letters, and challenge reports were assessed for documentation of reaction history, planned investigations, avoidance advice and safe alternatives and the clinic outcome.

**Results:** The drug clinic reviewed 49 patients with a mean delay of 2.73 months from referral to clinic. Referrals were for reactions to antibiotics (34), analgesics (5), anaesthetics (5), anti-epileptics (2), prednisolone (1), vaccines (1), drug unclear (1), (range = 1–34). 100% of referral letters mentioned symptoms of the reaction, while 44.90% listed the timing of symptoms. 23/49 clinic letters mentioned drugs to avoid until completion of investigations. 35/49 patients had challenges as part of their diagnostic work-up, with 3 completed so far (2/3 negative, 1/3 positive to penicillin (rash at challenge)). Of the 9 other drug challenges on the unit in March reviewed: 6/9 were for antibiotics, 2/9 for ibuprofen, 1/9 for articaine (1 inconclusive, 7 negative, 1 positive).

**Conclusions:** While overall, the details surrounding the reactions were well documented, there were areas where compliance with the NICE guidelines was sub-optimal. Areas for service improvement have been identified: medication avoidance and safe alternatives

while awaiting skin testing or challenge should be clearly documented in all cases.

## A117 | Prevalence of documented beta-lactam antibiotic allergy in hospital adult inpatients and audit against NICE CG183 and Manchester University NHS Foundation Trust (MFT) Antimicrobial Guidelines (AMG)

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**Objectives:** Around 20% of inpatients self-report a beta-lactam antibiotic allergy. Its overdiagnosis is associated with increased antimicrobial resistance, higher healthcare costs and poorer patient outcomes. We aimed to establish the prevalence of beta-lactam allergy across adult inpatients at a large University Hospital using full electronic patient records (EPR) and audit the adherence of clinicians to NICE CG183 and MFT AMG.

**Method:** The EPRs of inpatients aged ≥18y admitted to Wythenshawe Hospital during a 2-week period (26/04–10/05/2023) were screened and assessed to determine the prevalence of documented beta-lactam allergy and audited against a selected set of standards from NICE-CG183 and MFT-AMG, with recommendations on documentation and referral of patients with beta-lactam allergy.

**Results:** We identified 73 inpatients with documented beta-lactam allergy on their EPR; M/F = 1.15; median age:74 years (range:25–97). All 73 patients had their allergy appropriately recorded on their EPR 'Allergies' section (NICE-CG183-Standard-1), but only 3% (2/73) had all required minimum information recorded (NICE-CG183-Standard-2: drug name; details of reaction; reaction date). On discharge, 81% (55/68) of patients had their drug allergy status included in the discharge summary (NICE-CG183-Standard-4). Regarding NICE-CG183-Standard-6, concerning people who should be referred to a specialist allergy service for investigations, 72.6% (53/73) of patients fulfilled criteria; however, none were referred to specialist allergy services. Additional assessments revealed 0% use of the Trust AMG questionnaire.

**Conclusions:** Overall, the current practice of documenting drug allergy information and referring patients with beta-lactam allergy does not meet NICE-CG183 and MFT Antimicrobial Guidance. The main barrier to achieving compliance may be healthcare professionals' suboptimal awareness of documentation requirements and its importance and following antimicrobial stewardship principles by referring eligible patients for specialist investigation. There may also be a lack of confidence regarding de-labelling in cases where this is possible based on history alone. Education programmes/provision of decision support tools could help overcome these obstacles.

## A118 | Retrospective review of the pollen subcutaneous immunotherapy service at sheffield children's hospital

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**Objectives:** To provide a retrospective review of the Pollen Subcutaneous Immunotherapy (SCIT) service at Sheffield Children's Hospital (SCH) from 2014 to 2022, evaluating:

1. Demographic and clinical patient characteristics,
2. Adherence to guidelines in patient selection.
3. Referral sources.
4. SCIT-related adverse events (AEs) and their impact.
5. Treatment outcomes (patient-reported quality of life impact and medication use).

**Method:** The medical records of all patients who received pollen SCIT between 2014 and 2022 were reviewed. Relevant patient data was collected and anonymised.

**Results:** 62 children and young people (66% male), were initiated on pollen SCIT (mean age at initiation 14 years). 56% had at least one other atopic comorbidity, most commonly asthma (33%). 40% were referred from primary care, 26% from within SCH, and 34% from other secondary care centres. AR was suboptimally treated at referral in 48% of patients. The mean time from referral to SCIT initiation was 1.5 years (range: 0–5 years). Patients reported severe symptoms requiring oral steroid use ($n = 11$) and negative disease impact on school performance ($n = 51$), sleep ($n = 38$) and outdoor activities ($n = 41$).

98% and 61% received Pollinex Quattro Grass and Pollinex Quattro Tree respectively, with 60% receiving both.

Forty patients experienced mild AEs, most commonly delayed local reactions ($n = 23$). None lead to SCIT discontinuation, except a single patient who had anaphylaxis (treated with one dose of im Adrenaline) and was converted to sublingual immunotherapy.

Five patients (8%) discontinued SCIT due to pregnancy during COVID pandemic (1), flare-up of inflammatory bowel disease (2), missed appointments (1) and asthma deterioration (1). 34 patients completed 3 years of SCIT, with 97% reporting symptom improvement and 73% reporting reduction in AR medication use.

**Conclusions:** The pollen SCIT service in SCH has expanded successfully, with equitable access, high adherence to patient selection guidelines, low dropout rates, safe administration and favourable treatment outcomes.

### A119 | The evaluation of the effectiveness, safety, and adherence of paediatric aero-allergen immunotherapy in a large tertiary centre

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**Objectives:** The objective of the study was to evaluate the paediatric allergy immunotherapy service at University Hospital Southampton (UHS) by focussing on treatment effectiveness, safety and adherence.

**Method:** Retrospective data waweres collected from patients receiving allergen immunotherapy (AIT) from January 2017 to January 2022 targeting pollen or House Dust Mite (HDM) via electronic patient records at UHS. A validated Paediatric Allergic Disease Quality of Life Questionnaire (PADQLQ) and a questionnaire assessing the patient experience was used.

**Results:** 139 children received treatment and the mean age was 11.7 years with 74.8% (104) being male. 64% (89) and 36% (50) received pollen and HDM AIT, respectively. 69.7% (62) of pollen patients received sublingual immunotherapy (SLIT) while 30.3% (27) received subcutaneous immunotherapy (SCIT). 7.2% (10) discontinued treatment. Paired pre- and interim treatment PADQLQ scores were available for 48 patients. Overall, the scores significantly decreased by 62.6 (CI 52.2–73.1; $p < 0.001$). SLIT scores decreased by 64.3 ($n = 37$; CI 53.3–75.3; $p < 0.001$). SCIT scores decreased by 56.9 ($n = 11$; CI 25.9–87.9; $p = 0.002$). 22.2% (6) of SCIT patients ($n = 27$) reported no side effects, 44.4% (12) experienced local effects at the injection site, 22.2% (6) experienced local effects and fatigue, 11.1% (3) experienced fatigue only. Of the SLIT patients ($n = 112$), 57.1% (64) reported no side effects, 41.1% (46) experienced local effects, 1.8% (2) that experienced a systemic reaction also had severe asthma. SCIT adherence was excellent with zero doses missed unless patients discontinued treatment. 82.1% (92) of SLIT patients reported good adherence missing 1–2 doses/month, 6.3% (7) missed more than 6 doses/month. The main reason for non-adherence was reported as forgetfulness. 11 patients completed the service questionnaire. 91% reported varying levels of treatment benefit. There was unanimous satisfaction with the service.

**Conclusions:** All AIT modalities showed significant improvement in quality of life and symptoms. The likelihood of a systemic reaction was low.

### A120 | Real world effectiveness of allergen immunotherapy in patients with rhino-conjunctivitis: Data from BRIT Registry

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[1]*Addenbrooke's Hospital, Cambridge, UK*; [2]*University of Southampton, Southampton, UK*; [3]*University Hospital Southampton, Southampton, UK*

**Objectives:** The objective of the study was to describe the use of aeroallergen immunotherapy (AIT) and its effectiveness in the real-world setting using anonymised data from the BSACI Registry for ImmunoTherapy (BRIT).

**Method:** Anonymous data of 1102 participants receiving AIT for treatment of allergic rhino-conjunctivitis (AR) during 1st October 2018 to 30th June 2022 were extracted from BRIT. Real-world effectiveness of AIT was assessed by analysing change in quality-of-life (QoL) scores during treatment.

**Results:** AIT was given via subcutaneous (31.3%, 295/943) and sublingual (63.9%, 602/943) routes. Commonly used allergen extracts were pollen extracts, (652/940, 69.4%) or HDM extracts (182/940, 19.4%). 36.5% of participants had asthma (372/1019), but the modal majority were treated with low-dose inhaled steroids (136/372). An improvement in QoL was observed in 282/405 (69.6%) and the improvement seen was >MCID. (Median difference in the last and first score: RQLQ -18.5; PADQLQ −11 units). Response to the treatment with pollen (173/259, 66.8%) and HDM extract (50/64, 78.1%) was similar ($p = 0.249$) but participants treated for perennial AR showed better response (54/67, 80.6%) than seasonal AR (152/214, 71%; $p$ 0.003). 154 participants reported adverse events out of those, 12 had systemic adverse events, 9 stopped immunotherapy due to systemic side effects, 8 due to oral symptoms and 2 due to anaphylaxis (sublingual therapy).

**Conclusions:** Allergen immunotherapy is safe and effective in improving in QoL of adults and children with AR under the care of UK allergy specialists. House dust mite immunotherapy appears to be as effective as that to pollen in this real-world setting. Systemic side effects occur but are rare. Missing data is a common problem with registries and notable here, size of effect and season of reporting may also have influenced the results. Our registry data shows the impact of AIT in patient care in the United Kingdom.

(BRIT is funded through educational grants to the BSACI by commercial sponsors.)

### A121 | 'Discovering the demographic and socio-economic factors which influence patients' access to Immunotherapy for allergic and non-allergic diseases in the UK'

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**Objectives:** The objective of the study was to describe the demographic and socio-economic characteristics of participants enrolled with the BSACI Registry for Immunotherapy (BRIT).

**Method:** We reviewed all registry participants over 3.5 years from 1/10/2018 to 1/6/22. Participants provided written consent and shared personal identifiers with the registry. We used the Index of Multiple Deprivation (IMD) from home postcode to estimate socio-economic status for participants resident in England.

**Results:** 847/889 (95.3%) were residents in England. There were no participants from Scotland or Northern Ireland. 10.3% ($n = 91$) were between 16 and 25 years old compared to 480 (54.3%) under 16 and 313 (35.4%) over 25 years.

Most of the participants (692, 80.1%) were White and were more likely to be referred by their general practitioner (40.6%, 272/670), while Black and Ethnic Minority (BEM) participants were more likely to be referred by secondary care (122/168, 72%) ($P < 0.001$).

Less than half of all the patients in the study (35%) were from more deprived areas (1st–5th IMD decile). The median distance from home to the hospital 'as the crow flies' was 16.9 miles (IQR 6.3–39.3).

**Conclusions:** Our findings suggest that access to allergen immunotherapy services is patchy, especially among the devolved nations. There is a relative paucity of transition-aged young adults receiving specialist care.

Referral patterns varied according to ethnicity with BEM participants less likely to be referred directly from primary care. Access tended towards less deprived populations and there was evidence of cluster effect around specialist centres as seen by short travel distances for care for the majority of participants.

BRIT can contribute to the evaluation of health inequalities and in the future could contribute to enhancing the delivery of allergy care.

## A122 | The impact of intranasal phototherapy on the symptoms of allergic rhinitis in adolescents

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**Objectives:** Intranasal phototherapy is an ultraviolet light therapy used as an adjunct to standard medical management of allergic rhinitis, when standard treatment alone has been unsuccessful. Rhinitis symptoms are quantified using a Total Nasal Symptoms Score (TNSS). This is a reliable, validated questionnaire that is used by patients to self-report symptoms on a Likert scale (maximum score of 25). A reduction in TNSS equates to reduction of rhinitis symptoms. The objectives of our study were to determine whether intranasal phototherapy improved TNSS of patients that did not respond to standard treatment.

**Method:** We conducted a retrospective study of TNSS of all adolescents, who underwent intranasal phototherapy, between July 2018 and July 2022. All the patients in our cohort had previously failed to improve with standard treatment.

**Results:** 32 patients were identified, with the majority having the perennial type of allergic rhinitis (81.8%). Patients were mostly males (26 vs 6) with a mean age of 13.5 years. Of these, 30 (94%) patients demonstrated improvement in their TNSS. 19 out of 32 patients reported 50% or more improvement in their symptoms. Our average pre-treatment TNSS was 8.7 (95% CI 7.5 to 9.9), and ranging between 3 and 14. The average post-treatment TNSS was 4.0 (95% CI 2.8 to 5.2), with a range of 0–13. The average difference between the scores was 4.7 (95% CI 3.3 to 6.0), illustrating an overall improvement of 54%.

**Conclusions:** Our study could benefit from greater patient numbers. Also, a follow-up randomized control trial or a crossover trial comparing controls and patients, could illustrate a better comparison of symptom control across both groups.

However, the vast majority of our patients had a significant reduction in their nasal symptoms. We conclude that intranasal phototherapy complements the management of troublesome allergic rhinitis, alongside conventional treatments like oral, topical antihistamines and newer modalities like immunotherapy.

## A123 | Uncontrolled asthma and related risk factors among children attending hospital services in Ireland

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**Objectives:** Asthma symptoms are under-recognised, and many children are found to have poor asthma control during routine clinical review. The aim of this study was to determine rates of uncontrolled asthma and to investigate factors influencing asthma control among children attending paediatric hospital services in Dublin, Ireland.

**Method:** Parents of children aged 2–18 years with asthma attending hospital services for any reason from August 2022 to December 2022 were approached to complete a questionnaire relating to child's asthma control and associated factors. The Paediatric Asthma Control and Communication Instrument Sum Score of 3 or greater was used to identify uncontrolled asthma. Statistical tests were used to compare characteristics between children with controlled and uncontrolled asthma. Multivariate logistic regression was used to explore relationships between risk factors and uncontrolled asthma.

**Results:** Parents of 96 children completed the questionnaire, 52 (54.2%) in outpatient clinics and 44 (45.8%) in emergency settings. Overall, 63 of 96 children (65.6%; 95% confidence interval (CI): 56.1 to 75.1%) had uncontrolled asthma. Of 52 children who attended outpatient clinics, 31 (59.6%; 95% CI: 45.8 to 72.9%) had uncontrolled asthma. Odds of uncontrolled asthma reduced for each additional year of age (adjusted odds ratio (aOR): 0.81; 95% CI: 0.71 to 0.93; $p = 0.002$), while missed activities in the previous year increased odds of uncontrolled asthma (aOR 3.58; 95% CI: 1.35 to 9.53; $p = 0.01$). Children with uncontrolled asthma reported more oral corticosteroid use (Difference: 26.5%; 95% CI: 6.1 to 45%), emergency department visits (Difference: 30.7%; 95% CI: 11.7 to 45.0%) and difficulty accessing care (Difference: 26%; 95% CI: 1.5 to 37.8%).

**Conclusions:** The high rates of uncontrolled asthma may reflect the 'back to school' effect, where the risk of exacerbations increases due

to a surge in circulating respiratory viruses, which disproportionately affects younger children. All healthcare interactions with children with asthma are an opportunity to improve asthma control.

### A124 | Follow-up of adolescents attending the Emergency Department (ED) with acute asthma

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**Objectives:** Analyse discharge outcomes against standards and use data for the development of adolescent transition service.
**Method:** Notes review of 12–18 year olds who attended ED with asthma from April 2019–January 2023. Duplicates and wrongly coded notes were removed. Notes examined for discharge plans and clinic follow-up. Ages were stratified according to the Ready-Steady-Go transition programme. Asthma severity was graded (mild, moderate or severe/life threatening), and discharge outcomes grouped into no follow-up, GP or hospital (asthma CNS or consultant clinic) follow-up.
**Results:** 133 notes reviewed. 25% were 12–13 years (Ready) and 14–15 years (Steady). Half were aged 16–18 years (Go). 89 had mild asthma presentations: 54% (48) were followed up by their GP, 25% (22) had hospital follow-up and 21% (19) had none. All 22 hospital follow-ups had either previous severe attacks, adherence issues, or multiple attendances. 26 had moderate asthma attacks: 60% (15) had hospital follow-up, 35% (9) had GP follow-up, one was transferred, and only one patient had no documented follow-up. 18 had severe/life-threatening presentations who were all followed up in hospital (89% UCLH) and of the 16–18-year-olds, 60% were by the paediatric service, and 40% by adults.
**Conclusions:** There are national acute asthma standards relating to ED discharge. Most adolescents had appropriate secondary care asthma clinic follow-up: 100% for severe cases, 58% for moderate and 100% for appropriately selected mild cases. Deficiencies in data were due to inconsistent documentation. 50% of patients were in the 'Go' age range of transition (16–18 years), and 32% were mod/severe highlighting the urgent need for asthma transition. There was inadequate documentation to assess other standards e.g. asthma plans and inhaler technique, therefore we developed a 'discharge bundle', integrated into our IT system, to facilitate analysis of whether we meet these standards and to evaluate its impact.

### A125 | Exploring 'vaping' in teenagers with asthma: A 'hidden risk' behind the smoke screen

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**Objectives:** Smoking in teenagers with asthma is dangerous, but vaping is probably equally harmful to the inflamed respiratory mucosa. Increasing addiction to e-cigarettes put these teenagers at risk of worsening cough, excess mucous production, mucosal irritation and inflammation.
The study was designed to explore the health behaviour towards using e-cigarettes and vaping in teenagers with asthma.
**Method:** Twenty ($n = 20$) teenagers (male: female = 16:4) in the age range of 13–16 years from the Paediatric Allergy Clinic at a District General Hospital agreed to participate in this mixed method survey.
**Results:** The survey demonstrated that peer pressure (60%; $n = 12$), feeling of empowerment (75%; $n = 15$), ability to satisfy peer-expectations and 'looking cool' within their group (80%; $n = 16$) were the driving factors. Most teenagers in the study group choose vaping over smoking due to availability of various attractive flavours, 'easy on throat' and easy to buy or share. None of the teenagers received any counselling against vaping in either primary or secondary care asthma clinic. If vaping was not available, 40% ($n = 8$) said they would never smoke, 35% ($n = 7$) did not choose to answer while 25% ($n = 5$) may consider smoking cigarette. Seven of the teenagers (35%) reported increased nocturnal cough, frequent use of blue inhalers and recurrent episodes of upper respiratory tract infections.
**Conclusions:** This survey highlighted that teenagers with asthma were tempted towards vaping due to peer pressures and expectations, easy availability and multiple attractive flavours. Lack of counselling against vaping in both primary and secondary care were additional contributing factors. There is an urgent need for government policy and guidance to prevent vaping in young people to mitigate future respiratory health consequences.

### A129 | Monitoring changes in peak flow are a useful indicator of anaphylaxis in children and young people undergoing food challenge

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**Objectives:** Subjective chest tightness in the absence of overt chest signs can be difficult to interpret during food challenges. We evaluated peak flow (PEFR) as an objective sign of respiratory compromise during double-blind, placebo-controlled food challenge (DBPCFC).
**Method:** Post hoc analysis of data from children/young people undergoing DBPCFC to peanut or cow's milk. Subjects had PEFR recorded at baseline, prior to each challenge dose and as clinically indicated.
**Results:** Data were analysed from 161 DBPCFC; 35 (22%) had respiratory anaphylaxis (WAO definition). 28 (80%) had a ≥10% reduction in PEFR; in 13/28 (46%), this preceded onset of wheeze (4) or cough (9) by a mean 14 ± 12mins. In 18/28 (64%), the fall in PEFR exceeded 20% from baseline: 7 prior to cough/wheeze, 3 at the same time and 8 afterwards. In the 15 subjects with wheezing, 4 (27%) had a fall in PEFR of 10%–20% and 10 (67%) a decrease of >20% (4 prior to onset of wheeze).

In the 126 individuals without anaphylaxis, 27 (21%) also had a ≥10% reduction in PEFR, occurring prior to reaction in 16 and usually associated with significant abdominal pain or throat tightness. The reduction in PEFR was ≥20% in only 2 (1.5%) of subjects: one with abdominal pain and another who developed episodic coughing due to cough reflex; in both cases, the research team noted obvious poor effort in performing peak flow and therefore the reduction in PEFR was considered to be artefact.

**Conclusions:** Monitoring PEFR is a useful sign during food challenge, in young people able to comply with the test. Using a cut-off of a 20% fall from baseline seems to be a reliable indicator of objective reaction without false positives and often precedes onset of objective respiratory symptoms.

## A130 | Profile of anaphylaxis patients presenting to the paediatrics department at Princess Royal Hospital, Telford, UK

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**Objectives:** Anaphylaxis is a life-threatening, systemic, hypersensitivity reaction, characterised by rapidly developing changes involving the airway, breathing, circulation as well as the skin and mucosa. It is fairly common - about 1 in 1333 people in England have experienced anaphylaxis at some point in their lives. Approximately 20 deaths from anaphylaxis are reported each year in the United Kingdom, with around half the deaths being iatrogenic.

Our objective was to describe the profile of anaphylaxis patients presenting at our Paediatric A/E and Paediatric Assessment Unit at Princess Royal Hospital, Telford. We also investigated if we met the 14 standards of quality, in the management in anaphylaxis, set out by NICE.

**Method:** We conducted a retrospective, observational study among children aged 0 to 16 years, admitted between 2014 and 2021 with a diagnosis of anaphylaxis. 45 hospital admissions were identified across 43 patients, over this 7-year period, and scrutinised against the 14 standards of quality.

**Results:** The majority of patients were male (31 vs 12) whereas the median age was 8 years. All incidences were accidental ingestions of allergens, with no incidences of insect bites or aeroallergens. The most common culprits were milk, egg and nuts. Out of the 14 standards of quality, we fared 'Adequate' in eight standards. The six standards that needed improvement were mostly related with patient education or ordering tryptase levels appropriately.

**Conclusions:** Food allergens caused all the anaphylactic reactions in our cohort, with the majority being accidental and being more frequent in males. Though we did not cause any gross harm to our patients, we identified a need for improvement in patient education and diagnostics. This led to the development of an educational leaflet, which aimed at educating both the treating physician and the patient. This leaflet has been incorporated into the Trust guidelines.

## A131 | Severe and refractory anaphylaxis occurring as an unexpected cluster: Case series

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**Objectives:** *Background*: Severe anaphylaxis, requiring >2 doses of adrenaline is rare. Refractory anaphylaxis, requiring adrenaline infusion is very rare. We report a cluster of 4 severe, refractory anaphylaxes during an 8-month period.

**Method:** *Case Presentation*: *Refractory anaphylaxis to baked cows milk*: 17 year-old female, never consumed/reacted to baked milk. Previous anaphylaxis to cows milk café latte which self-resolved. Well controlled asthma. Reacted after dose 4 (0.4 g protein-total) with severe respiratory distress and wheeze. Deteriorated despite 3 intramuscular (I.M.) adrenaline doses; resolved following intravenous adrenaline bolus, 2 adrenaline nebulizers, then adrenaline infusion. 12 year-old male, never consumed/reacted to baked milk, twice previous mild anaphylaxis after ice-lolly/boiled sweet, resolved with single adrenaline dose. Reported controlled asthma. Reacted after dose 5 (0.9 g protein-total) with respiratory distress and wheeze. Initial response to 2 I.M. adrenaline doses, but deteriorated with hypotension requiring further 2 I.M. adrenaline, resolved following adrenaline infusion. *Severe anaphylaxis to hard-boiled/cooked egg*: 6 year-old female, reportedly tolerating ½ hard-boiled egg. History of intermittent asthma. Reacted after half-dose 5 (2.9 g protein-total) with severe cough and wheeze, desaturation. Partial response after 3rd IM adrenaline dose followed by slow recovery. *Severe anaphylaxis to baked egg*: 2 year-old male, index-reaction to cooked/scrambled egg. No wheeze history. Reacted after dose 4 (1 g protein-total) with cough and wheeze, response after 2 I.M. adrenaline doses. Deteriorated 30 min later, requiring 3rd adrenaline dose.

**Results and Discussion:** No cases of refractory anaphylaxis nor requirement for 3rd doses of adrenaline occurred in the service in the preceding 10 years. A matrix-effect for baked milk/egg challenges may lead to protracted reactions and repeated deteriorations. No common risk factor could be identified.

**Conclusion:** Refractory and very severe anaphylaxis are rare. Training in and review of human, environment and equipment factors is essential in food challenge services. Matrix-bound foods pose risk of protracted reaction.

## A132 | Evaluation of understanding of the acute and long-term management of anaphylaxis among doctors working within acute paediatrics

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**Objectives:** Anaphylaxis is a dramatic expression of systemic allergy. The lifetime prevalence of anaphylaxis is currently estimated at 0.05%–2% in the USA and ~3% in Europe. Several population-specific

studies have noted a rise in the incidence, particularly in the ED visits and hospitalisations due to anaphylaxis. (Yu and Lin 2018).

It is vital that Paediatric staff working in the acute setting have adequate knowledge and understanding of clinical signs and symptoms of anaphylaxis and are also trained in the time specific management of anaphylaxis as per the national guidelines.

This project analyses the current level of understanding of anaphylaxis and its management among clinicians working with children in a district general hospital.

**Method:** A questionnaire on anaphylaxis was prepared and distributed to doctors working in General Paediatrics at West Middlesex University Hospital. The questionnaire was based on current guidelines on anaphylaxis from Resuscitation Council UK, WAO, EAACI and used as an objective measure of the doctors' current knowledge base.

**Results:** Recognition of anaphylaxis was good among the cohort, though the frequency of absence of the skin and mucosal manifestations were underestimated.

There was a discrepancy between respondents in the prioritisation of interventions in anaphylaxis.

42% of responders were unaware of when to treat anaphylaxis as refractory.

There was a lack of understanding of serum tryptase levels and the importance of its use in diagnosis of anaphylaxis.

Discharge management of a patient following anaphylaxis was well understood.

**Conclusions:** The results highlighted a good understanding of anaphylaxis, but demonstrated areas where further education would be beneficial (e.g. refractory anaphylaxis). We are developing targeted educational resources and interventions (e.g. a teaching by a Paediatric Allergy Specialist and several simulation sessions.)

We hope to further the scope of these findings by disseminating the questionnaire among other Paediatric units to see if this is a widespread learning gap.

## A134 | Carriage of adrenaline auto-injectors in a paediatric allergy clinic

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**Objectives:** Patients at risk of anaphylaxis are prescribed adrenaline auto-injectors (AAIs)1. The MHRA 2018 (Medicine Healthcare Products Regulatory Agency) standard is that patients always carry two AAIs. This self-care habit arms patients with life-saving adrenaline in the event of anaphylaxis. Fatal anaphylaxis is associated with non-access to AAIs or inappropriate administration2,3. Research into adults and adolescents suggests poor compliance with the standard. The objective is to understand our patients' compliance with the MHRA standards and associated demographic factors.

**Method:** Case notes of patients attending a consultant-led paediatric allergy clinic in secondary care were retrospectively reviewed, covering a 5-month period. Two clinicians collected the data which was analysed independently using Chi-square ± Fisher's exact tests.

**Results:** Data were captured for 60 patients; cleaning resulted in a final $n = 50$ analysed. Patients ranged 0–15 years old; 88% ($n = 44$) were 11 or younger. Only 46% met the standard of having two AAIs in clinic, in date. Of the 27 sub-standard patients, the majority ($n = 21$) had zero pens, with 5 carrying one in date pen and 1 patient carrying two, but expired. While there was no evidence of a statistical difference in carriage between demographic groups, most White patients (52%) met the standard compared to 44% BAME.

**Conclusions:** This review highlights poor compliance with the MHRA 2018 standards on AAI carriage in a selected population. The findings support current literature on poor AAI carriage. Interestingly, less BAME patients met the standard compared to White patients, although not significant. Limitations include small sample size. Current literature focuses on carriage of AAIs by adults and adolescents. Most patients in this review were 11 years or younger, highlighting that intervention should target all ages. Future research should explore the barriers and facilitators of AAIs carriage across age groups and ethnic backgrounds. There are no conflicts of interest.

## A135 | '2 at home, 2 at school': What is the best way to keep our patients safe when adrenaline auto-injector supplies are short?

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**Objectives:** Allergists commonly use the mantra '2 at home, 2 at school' for patients carrying adrenaline auto-injectors (AAI). However, we often see our patients infrequently, and prescribing may deviate between appointments. We aimed to determine the provision of AAIs to our paediatric cohort and uptake of spare AAIs in local schools.

**Method:** We designed two questionnaires: one for patients attending our clinic, the other for schools in Enfield.

**Results:** 38 patients completed the clinic questionnaire, including 16% (6/38) attending nursery, 45% (17/38) primary school and 29% (11/38) secondary school.

71% (12/17) of primary school children had 2 AAIs specifically for school, compared to 27% (3/11) of secondary school children. Worryingly, 29% (5/17) of primary school and 55% (6/11) of secondary school children reported carrying less than 2 AAIs outside school.

68% (26/38) reported difficulties maintaining AAI prescriptions. These included remembering expiry dates (8/26), contacting GP (10/26), persuading GP to prescribe (13/26) and lack of pharmacy stock (15/26).

There were 28 responses to the school questionnaire. 57% (13/24) primary schools and 75% (3/4) secondary schools carried spare AAIs.

**Conclusions:** Patients should have access to 2 AAIs at all times. However, our data demonstrates a shortfall, and highlights some common difficulties patients experience in obtaining them. A collaborative approach between allergy teams, GPs, parents and schools

is needed to keep our patients safe in spite of 'real world' problems with AAI supply. Given AAI supply issues, there may be scope to adapt the '2 at school' rule for some patients. Responsible patients could carry their 'home' AAIs even while at school, especially in schools where spare AAIs are available as an additional safety-net. Going forward, we will explore how our messages to patients, GPs and schools can be refined to improve AAI carriage, in order to reduce the difficulties patients have obtaining AAIs they need.

### A136 | Uptake and usage of spare adrenaline auto-injectors in schools across Hampshire and Dorset

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**Objectives:** Food allergy rates are increasing in the paediatric population and can be fatal unless treated with adrenaline. Common food allergens are difficult to avoid in schools as food bans are hard to regulate. In October 2017, a UK legislation was introduced for spare AAIs (Adrenaline Auto-Injectors) to be used to treat anaphylaxis in an emergency. The 'Spare Pens in Schools' programme provides information about the importance of spare AAIs for student safety at school. The aim of this research was to estimate the proportion of schools that held spare AAIs and raise awareness of them.
**Method:** A survey was sent to 777 schools across Hampshire and Dorset. 115 schools responded, and the data was analysed on SPSS.
**Results:** 14.8% (115/777) of schools responded (response rate) and overall, 48.2% (55/114) of schools held spare AAIs. More schools in Hampshire held them than in Dorset, 52.9% (45/85) and 30.8% (8/26) respectively (Chi-squared $p = 0.048$). 74.7% (62/83) primary schools and 62.5% (10/16) secondary schools had heard of spare AAIs (Chi-squared $p = 0.316$) indicating that awareness was good, but uptake could be improved. 48.6% (54/111) of schools with food allergic students held spare AAIs suggesting that a higher risk of anaphylaxis may influence uptake. Our results also suggested that the larger the school, the higher the uptake was as 75.0% (12/16) of schools with over 500 students held spare AAIs compared with 43.2% (41/95) in smaller schools (Chi-squared $p = 0.018$).
**Conclusions:** Almost half the schools that responded held spare AAIs; however, there was variation between both counties. Larger schools were more likely to have joined the scheme; however, no schools needed to use spare AAIs. Common barriers to uptake were cost and lack of usage. The main drawbacks were response rate and report bias. Sending out the survey increased awareness of spare AAIs and may boost uptake.

### A137 | An evaluation of adrenaline auto-injectors in schools: Are 'spare pens' missing the mark?

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**Objectives:** To evaluate the provision of adrenaline auto-injectors (AAIs) in local primary schools 5 years on from the 2017 launch of the 'Spare Pens' initiative against MHRA guidelines. We aimed to identify:

- Number of children with allergies.
- Provision of AAIs and awareness of 'Spare Pens'.
- Verification of AAI provision and expiry dates within a sample group.

**Method:** An online survey was designed and sent to all 142 primary schools identified in Cardiff and Vale UHB's area. It gathered information on the schools' declared number of children with allergies, AAIs, awareness/uptake of 'Spare Pens' and storage of AAIs.
A sample group of 5 schools were visited to verify the: number of AAIs per student; spare AAIs; storage and expiry dates. The visits also enabled discussion of the barriers associated with allergy management and the implementation of 'Spare Pens' in schools.

**Results:**

- Of the 142 primary schools, 48(33.8%) responded. This captures 14,442 pupils; of whom 618(4.3%) have at least one allergy and 117(0.81%) require AAIs.
- Just over half, 19(53.8%), stored pupils' AAIs in their classroom. A third, 17(35.4%), were aware of the 2017 'Spare Pens' legislation allowing schools to obtain spare AAIs, but only 4(8.3%) had implemented this change.
- In the sample group, 6/33(18.2%) AAIs were expired and a third of pupils did not have the MHRA recommended two AAIs in school 6/18(33.3%).
- Barriers highlighted included: communication difficulties with parents and lack of funding for spare AAIs.

**Conclusions:** The majority of respondent schools were unaware of the 'Spare Pens' initiative.

- Provision of AAIs in the sample schools often did not meet the MHRA standards.
- To save lives from anaphylaxis, improved provision of in-date adrenaline is needed. Would a 'centralised' provision of school AAIs overseen by local allergy/pharmacy services be more efficient and prudent?

### A138 | Spare pens in schools: A survey of uptake in schools in Peterborough

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**Objectives:** The objectives of this re-audit were to characterise the usage of AAIs in schools, assess the uptake of the Spare Pens in Schools scheme since the first cycle in the summer of 2019 and identify any potential barriers obstructing uptake.
**Method:** Forty-nine schools in Peterborough and the surrounding areas were contacted with a survey.
**Results:** Forty-nine schools in Peterborough and the surrounding areas were contacted with a survey. A reply was received from 43%, capturing a total of 12,527 students. 48% of schools had heard of the Spare Pens in Schools scheme. However, only seven (33%) had utilised it. This is an improvement on the two schools (18%) in 2019. The most common reason given for not utilising the scheme was being unaware of it. Therefore, lack of awareness is a key factor preventing uptake of the Spare Pens in Schools scheme. All schools reported they would be able to treat anaphylaxis immediately, if not within minutes. Encouragingly, 19 schools (90%) had Allergy Action Plans in place for their students with allergies.
**Conclusions:** This re-audit does show an improvement from the initial audit in 2019. However, the comparison is limited by the fact that only one school reported participating in the original audit and not all the data from the first cycle is available.
Recommendations for further action include:

- Liaising with the local School Nursing team to share information on the Spare Pens in Schools scheme.
- Training and allergy advice to be offered to those schools who are interested.
- Liaising with the pharmacy lead for the Cambridge and Peterborough CCG regarding funding for schools to obtain AAIs.

### A139 | Retention of anaphylaxis knowledge and adrenaline auto-injector administration among patients and families under the care of a tertiary allergy centre

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**Objectives:** *Aims*: Food allergies affect an estimated 6% of children in the United Kingdom (Luyt, et al. 2016), with the rate of hospital admissions for anaphylaxis increasing 5.7% annually between the years of 1998 and 2018 (Conrad et al. 2021). Education on how to manage anaphylaxis is therefore essential in both improving patient outcomes and promoting effective health management. The aim of this audit was to examine the retention of anaphylaxis knowledge among patients and families across a tertiary allergy centre in West Yorkshire.
**Method:** During clinical review appointments, patients with pre-existing adrenaline auto-injectors (AAI) were asked a series of questions pertaining to their knowledge of adrenaline auto-injector and anaphylaxis in general. Questions were asked by a combination of allergy nurses and consultants, following a framework consisting of 10 questions.
**Results:** In total, data was obtained from 70 patients aged 1–18 years. Of these patients, or their parents/carers, 57% carried their AAI with them at all times, while very few—30% and fewer—were able to correctly identify all the symptoms of anaphylaxis, or the recommended positioning of the patient. The data collected in this audit highlighted that the key areas of knowledge attrition were AAI carriage, correct positioning of the individual, and any symptoms of anaphylaxis other than breathing difficulty.
**Conclusions:** In conducting this audit, we have begun to consider new ways of teaching which may better improve the retention of knowledge around anaphylaxis. These include active involvement of the patient and family when training and prospective development of a teaching package to be used when delivering AAI training to new patients, ensuring key topics are covered. Additionally, techniques to promote safety in all situations, particularly if the patient does not have their AAI device with them, are to be considered.

### A140 | Onset of atopic comorbidities relative to atopic dermatitis diagnosis in a real-world setting using an Israeli Claims Database

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**Objectives:** Describe the epidemiology of type 2-associated conditions in the 'atopic march' (asthma, allergic rhinitis [AR], food allergy [FA]) among paediatric patients newly diagnosed with atopic dermatitis (AD).
**Method:** This retrospective cohort study used the Israeli Maccabi Healthcare Services database. International Classification of Diseases codes identified patients with AD diagnosed during 2000–2019. Index date was the earliest AD diagnosis. Patients had to have been enrolled for ≥12 months pre-index to exclude prevalent AD. Diagnosis data were obtained during 1998–2020 to describe the cumulative incidence of asthma, AR and FA (−1, 0, 1, 5, 10, 20 years) using Kaplan–Meier analysis among patients aged <3, 3–5, 6–11, 12–17 years at AD diagnosis.

**Results:** 177,081 paediatric patients (52.5% male; 60.4% aged <3 years) with AD were included. At AD diagnosis, 24.5% had a prior/concurrent diagnosis of asthma/AR/FA (asthma: 17.4%, AR: 6.5%, FA: 4.4%). Cumulative incidences of asthma/AR/FA were 33.2%, 44.2%, 50.6%, 59.9% within 1, 5, 10, 20 years, respectively, post-AD diagnosis. Patients aged <3 vs ≥3 years at AD diagnosis were less likely to have a prior/concurrent diagnosis of asthma/AR/FA at AD diagnosis (16.2% vs 35.1–40.3% across older age groups), by 5 years post-AD, this difference had diminished to 42.7% vs 44.8–49.4%, respectively.

**Conclusions:** Most AD diagnoses occurred at age <3. Patients aged <3 vs 3–17 years at AD diagnosis were less likely to have a prior/concurrent asthma/AR/FA diagnosis, consistent with AD being the first clinical sequence in the atopic march journey. The sharp increase in the first 5 years post-AD diagnosis in patients aged <3 years led to similar prevalence as for other paediatric age groups at that time point. Almost 60% of the paediatric population at 20 years post-AD diagnosis had asthma/AR/FA.

## A141 | Does food allergy test-guided dietary advice improve eczema control in children? Protocol for Trial of food allergy IgE tests for Eczema Relief (TIGER) study

Matthew Ridd[1]; Stephanie MacNeill[1]; Yumeng Liu[1]; Miriam Santer[2]; Tom Blakeman[3]; Hannah Wardman[3]; Ingrid Muller[2]; Joanna Coast[1]; Kirsty Garfield[1]; Robert Boyle[4]; Rosan Meyer[4]; Isabel Skypala[5]; Shoba Dawson[1]; Hannah Morgans[6]; Julie Clayton[1]; Sara Brown[7]; Hywel Willia[8]

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**Objectives:** The objective of the study was to determine the clinical and cost effectiveness of test-guided dietary advice versus standard care, for eczema management.

**Method:** Pragmatic, multi-centre, parallel group, individually randomised controlled trial (ISRCTN52892540), with internal pilot and nested economic and process evaluations. Children (<2 years) with mild or worse eczema will be recruited from ~84 GP surgeries and randomised 1:1 to comparator or intervention groups. All participants will receive our 'Good eczema care' leaflet. Those in the intervention group will also undergo skin prick tests to milk, wheat, egg and soy, and advised to eliminate any foods to which they are sensitised for 4 weeks.

The primary perspective of a health economic analysis will be NHS. A cost-utility analysis will compare quality-adjusted life years (QALYs) gained for the child and main carer to costs incurred by the NHS. Additionally, costs from NHS and non-NHS perspectives will be related to a range of outcomes in a cost-consequences approach.

A nested process evaluation will assess intervention fidelity, clarify causal mechanisms and identify contextual factors associated with variation in outcomes. We will interview clinicians and parents and observe and recruitment visits. We will explore quantitatively potential mediators of adherence and intervention outcomes.

**Results:** 493 participants will be followed up over 36 weeks. The primary outcome is eczema control, measured by the parent completed RECAP, collected four-weekly over 24 weeks. Secondary outcomes include: eczema symptoms; quality of life; adverse events; breastfeeding status and diet; growth; parental anxiety.

The primary analysis will be a multilevel mixed model framework with observations over time nested within participants.

**Conclusions:** Many parents worry that a food allergy is the underlying cause for their child's eczema and ask doctors about allergy tests. This study will fill an evidence gap of importance to patients and carers and reduce variation in practice and associated harms.

## A142 | Skin prick testing and dietary advice as part of eczema management in young children: A Delphi consensus study

Ludivine Garside[1]; Robert Boyle[2]; Rosan Meyer[3]; Isabel Skypala[4]; Hilary Allen[5]; Justine Dempsey[2]; Matt Doyle[6]; Helen Evans-Howells[7]; Mary Feeney[8]; Siân Ludman[9]; Tom Marrs[10]; Jane Ravenscroft[11]; Gary Stiefel[12]; Deepan Vyas[13]; Natalie Yerlett[14]; Sara Brown[15]; Matthew Ridd[1]

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**Objectives:** The objective of the study was to conduct a consensus exercise on how skin prick tests (SPTs) for four common food allergens (cow's milk, hen's egg, wheat and soya) should be used in conjunction with dietary history to guide dietary advice for eczema management in children under 2 years.

**Method:** Fourteen clinicians from general practice, paediatrics, paediatric dermatology, paediatric allergy and paediatric nutrition took part in an online Delphi study. Over three rounds, participants gave their anonymous opinions on relevant clinical symptoms, allergens, SPT thresholds and dietary advice according to SPT results and dietary history. Participants received individualised and group feedback from each round. Consensus was defined as agreement of 80% or

above; items with agreement <80% were carried through to the next round or discussed at an online workshop.

**Results:** Participants engaged with all surveys except one person in round two. Of 14 symptoms, 12 were identified as relevant to immediate allergy and 7 to delayed allergy. Consensus was reached for the type of wheat and soya allergens used for SPT (commercial reagents), but not for milk or egg. SPT wheal size was determined negative 0–1 mm and sensitised ≥5 mm; interpretation between 2 and 4 mm varied across foods. A flowchart of pragmatic dietary advice, based on SPT results and dietary history, was agreed in the workshop to guide food exclusion, oral food challenge, home dietary trial [LG1] or home food inclusion.

**Conclusions:** The routine use of food allergy tests and dietary exclusions for managing eczema in children is controversial and not currently evidence-based. We obtained clinical consensus on what dietary advice should be offered to parents and carers of young children when SPTs are employed in conjunction with dietary history to support eczema management. The resulting flowchart is undergoing formal evaluation in a randomised controlled trial: Trial of food allergy (IgE) tests for Eczema Relief (TIGER) (NIHR133464, ISRCTN52892540).

## A143 | Parent satisfaction with lotion, cream, gel and ointment emollient types: Secondary analysis of Best Emollients for Eczema study

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**Objectives:** Previously, data from the COMET feasibility trial suggested that parents prefer lotions > gel > cream > ointment (Rowley 2022). We compared parental satisfaction with these four types of emollients, using data from the Best Emollients for Eczema (BEE) trial.

**Method:** BEE was a pragmatic, multi-centre, individually randomised, parallel group superiority trial. 550 children between ages 6 months to 12 years were recruited from GP surgeries in England and randomised to a lotion, cream, gel or ointment type of emollient. There was no evidence of differences in the primary (POEM scores over 16 weeks) or secondary outcomes, although on a single 'overall satisfaction' question, lotions and gels appeared to be more satisfactory than creams and ointments.

At 16 weeks, participants completed the Emollient Satisfaction Questionnaire (ESQ), a nine-item questionnaire, seven of which can be summed to give a scaled score of 0 to 28 (low to high satisfaction). In this study, we compared ESQ scores for the different emollient types.

**Results:** Complete ESQ data were available on 378 (68.7%) participants, 87.8% white with mean age 4.8 years (SD 3.2) and baseline mean POEM 9.0 (SD 5.2). Of those participants completing the POEM at 16 weeks, ESQ completion rates differed by emollient (cream 94.8%, lotion 90.8%, gel 81.8% and ointment 78.9%, $p < 0.001$) and eczema severity at baseline (mean POEM with complete ESQ 9.0 (SD 5.2), incomplete ESQ 10.1 (SD = 5.9); $p = 0.021$).

Mean ESQ scores were gel 27.9 (SD = 5.3), lotion 27.4 (5.6), cream 25.8 (6.3) and ointment 22.2 (6.8) ($p < 0.0001$). In pairwise comparisons of means using the Bonferroni correction, there was evidence of a difference in mean scores between ointment and lotion ($p < 0.0001$), ointment and cream ($p < 0.0001$) and ointment and gel ($p < 0.0001$).

**Conclusions:** Consistent with previous findings, gel and lotion types of emollients were preferred to cream and ointment.

## A144 | The effect of house dust mite immunotherapy on eczema in a paediatric population

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**Objectives:** House dust mite (HDM) immunotherapy is licensed for use in allergic rhinitis (AR). There is limited evidence of additional benefit to eczema.

**Aims:**

- To understand the demographics of those prescribed HDM immunotherapy, including a diagnosis of eczema.
- To identify changes in eczema severity and treatment burden following completed treatment.

**Method:** Retrospective chart review of patients who completed a three-year HDM immunotherapy course for AR in the paediatric allergy department at King's College Hospital between April 2012 and November 2022. Data were collected on age, sex, ethnicity, history of atopy, eczema treatment and dermatologist care.

**Results:** 79 patients completed HDM immunotherapy. Mean age at initiation was 128 months (72–189). 66% were male. 48% had eczema, 49% food allergies, 53% asthma, 71% sensitised to other aeroallergens (grass/tree pollen and cat most frequently).

Of the 38 patients with eczema at immunotherapy initiation, treatments included: emollient only (50%); emollients in combination with topical steroids (42%) (mild 6/38, moderate 3/38, mild and moderate 2/38, potent 1/38, moderate and potent 4/38). Four patients were under dermatology review, with two failing to attend.

At immunotherapy completion, treatments included: nil (40%); emollient (29%); emollient and topical steroids (26%) (mild 2/38, moderate 1/38, mild and moderate 1/38, potent 5/38, moderate and potent 1/38). Three patients remained under dermatology review, with three referred who failed to attend.

Overall, 25 (66%) experienced eczema improvement in terms of treatment burden. Seven (18%) had no treatment change, four (11%) required treatment escalation and two (5%) were unknown.

**Conclusions:** Following a completed course of HDM immunotherapy the majority of patients experienced improvement in eczema severity, with 40% no longer requiring prescribed treatment. Topical

steroid use and strength reduced overall. Dermatology input was unchanged. HDM immunotherapy for AR is therefore likely to be associated with eczema improvement in our patient population.

No external funding received.

## A145 | The impact of exacerbating triggers on the prognosis of chronic spontaneous urticaria in children: The potential role of nutritional deficiencies and poor mental health

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**Objectives:** Chronic Spontaneous Urticaria (CSU) is well documented in adults, but there are limited studies in children. There is insufficient evidence to provide specific recommendations for the diagnosis, treatment, and management of CSU in children. Current national and international guidelines remain limited. This study aimed to investigate the triggers related to exacerbation of CSU in paediatric patients related to their age, response to treatment and outcomes.

**Method:** Retrospective e-record data for 193 patients was analysed (25/1/13–12/5/23). Diagnostic tests results, treatment, disease duration and associated exacerbating triggers were analysed.

**Results:** The cohort included age categories: <2 years (7.8%, *n* = 15), 2–5 years (19.2%, *n* = 37), 5–10 years (32.6%, *n* = 63), and 10–18 years (40.4%, *n* = 78).

Of patient cohort with results available, 47(37.9%) had iron deficiency, 51(38%) had vitamin D insufficiency, and 21(16.0%) had vitamin D deficiency. Common triggers in age groups included: viral infection (<2 years = 60%, *n* = 9); iron and vitamin D deficiency/insufficiency (2–5 years = 71.4% vitamin D, 57.1% iron); and stress (5–10 years = 17.4%, *n* = 15). The prevalence of stress exacerbation increased between 10 and 18 years to 29.5% (*n* = 21).

Duration of disease was noted for different triggers: Stress (33 months ± 24.6), viral infection (14.7 months ± 13.1), iron deficiency (after supplementation) (9.9 months ± 5.2), and vitamin D (11.2 months ± 6.5).

Six patients (3.1%) required Omalizumab alongside psychological support due to treatment resistant stress-associated CSU.

**Conclusions:** Nutritional deficiency could be a prevalent exacerbating trigger of CSU in children and is not currently recognised by the guidelines. Nutritional deficiency, viral infection and stress were predominantly associated with different age groups and disease duration. CSU could present as different endotypes in children compared to adults, and further research is warranted.

CSU is strongly associated with mental health conditions, often requiring psychological support in young adults. These results propose a novel CSU Quality of Life Questionnaire.

*Project funded by Newcastle University*.

## A146 | Lost in transit: Allergy clinic information in schools—*what's the reality?*

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**Objectives:** Paediatric food allergies are common and 17% of fatal food-anaphylaxis occurs in school. Legislation allows schools to purchase 'generic' adrenaline devices with further risk reduction via health service support—for example clinician completed Allergy Management Plans (AMPs) and prescribed medications. Do the recommendations from allergy clinic reach the school environment? Our aim was to investigate the current level of Tower Hamlet school provision for known Royal London food allergic pupils.

**Method:** Schools for 89 Tower Hamlets pupils with new AMPs (over a 6 month period) including prescription recommendations for antihistamines and adrenaline auto-injectors (AAIs) were identified. Information was collected via school e-mail questionnaire or telephone, and GP records were reviewed via the East London Health Record. A further survey was sent looking at AMP distribution pathways used by other UK paediatric allergy services.

**Results:** Information for 45 patients, across 27 schools was collected. Seven (16%) had an up-to-date AMP, correct antihistamine prescription, and two in-date AAIs of correct dose and brand. Five (11%) had no AMP in school, and 21 (52%) had out-of-date plans. Discrepancies between plans and the medications available were found in 18 (45%)—six had no personal AAI and 11 had no antihistamine in school. 20/27 schools (74%) carried 'spare' AAIs. Survey responses from 26 allergy services indicated nine (35%) had no specific pathway for providing Primary Care teams with a direct copy of the AMP, and 19 (73%) said they relied solely on parents giving the AMP provided via clinic to schools.

**Conclusions:** Many pupils were not receiving the clinic recommended level of allergy provision although ¾ schools provided 'generic' AAIs. With these data and stakeholder involvement further action can be taken to identify the issues involved, improve communication and develop pathways to meet the need. This could then become a blueprint for similar reviews in other areas of the United Kingdom.

## A147 | Professionals information leaflet use drastically reduces allergy clinic waiting times at Staffordshire Children's Hospital

Mica Skilton[1]; Sehrish Gul Muhammad Aziz[1]; Dina Swilem[1,2]; Mona Samra[1]; Fiona Halton[1]

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**Objectives:** Paediatric allergy clinic waiting times across the country are long. Idiopathic urticaria (IU) is an innocuous condition affecting

2%–5% of the population, with 70% of children outgrowing it within 4 years. Similarly, non-IgE food allergy and eczema is increasingly common and frequent referrals to allergy clinic are received for both conditions. This study aims to assess whether the number of accepted referrals and allergy clinic waiting times could be reduced by rigorously screening referrals and thereafter providing written professionals advice leaflets to the referrer.

**Method:** Data for allergy clinic waiting lists was retrospectively collected and analysed over two 6-month time periods; prior to the introduction of professionals advice leaflets (November 2019–April 2020) and afterwards (October 2022–March 2023).

**Results:** In the initial data collection period, there were a mean of 109 patients on the allergy clinic waiting list each month, and the longest mean waiting time was 31 weeks. Following the introduction of advice leaflets, waiting list numbers reduced over a 6 month period by 70% to 33 patients per month, and waiting times reduced by 60% with the mean longest wait being 12 weeks. In January 2023, all new allergy patients were seen within 7 weeks. From October 2022 to March 2023, Staffordshire Children's Hospital received a total of 300 allergy referrals. Using the professionals advice leaflets, 136 referrals (46%) were accepted and 164 (54%) rejected.

**Conclusions:** The introduction of professionals advice leaflets for IU and eczema at Staffordshire Children's Hospital has drastically reduced both waiting times and total waiting list numbers. These information leaflets have helped to educate and empower both GPs and families to treat IU and eczema in a primary care setting, with secondary referral required only for complex or refractory cases. During the study period, there were no complaints regarding rejected referrals from either GPs or families.

## A148 | The impact of QR codes and online educational resources on patient experience in allergy paediatric services

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**Objectives:** Investigate if digital resources such as QR codes have an impact on patients experience, bring innovation and improve practices in clinics.

**Method:** Using a purposive sampling strategy, we selected a mixed sample of carers and CYP who had received paper resources in previous clinic visits. The candidates were given the QR code links and asked to complete a questionnaire on their experience of the method used to share the educational and training material.

**Results:**

- 95% believed the QR codes improved their experience.
- 95% reported that it easy or very easy to access the QR codes.
- 4% found the QR codes difficult to access. A comment highlighted some difficulties in scanning the codes due to the layout and device used.
- 86% were likely and extremely likely to access the information again. However, one patient highlighted that if the link is not instantly saved on the phone, they may not be able to access it again after clinic.
- 77% of people reported they will not return to paper resources.
- 23% May be more likely to review paper resources.

**Conclusions:** Most carers an CYP report QR codes have positively impacted their experience of receiving information during their appointment. Based on the patient feedback this is a great way of sharing educational resources, however we would have to consider retaining as small amount of paper resources as an option for patients that do not have access to phone devices, do not have the technical skills or have disabilities.

## A149 | The benefits of non-emergency access to a paediatric allergy nurse telephone service for patients and their families

Sinead McAteer; Marianne Cowan; Annie McAleer
*BHSCT, Belfast, UK*

**Objectives:** Access to healthcare services is a critical aspect in the promotion of positive health outcomes for patients and their families. For families dealing with paediatric allergies, access to a specialist allergy nurse can provide much needed support and guidance. Here, we aim to examine the benefits of non-emergency access to a paediatric allergy nurse telephone service for patients and their families.

**Method:** A retrospective data analysis was conducted of patients and families who used the allergy nurse telephone service, between January 2020 and December 2022. Our analysis included patient demographics, call types, call volumes and outcomes.

**Results:** Our results demonstrate that non-emergency access to a paediatric allergy nurse telephone service provides significant benefits for patients and their families. These benefits include increased access to expert advice and guidance, reduced need for emergency care, improved management of allergy symptoms, with increased confidence and peace of mind for families.

Our analysis shows that the majority of calls were related to general allergy management, medication questions, and advice on symptom management. Call volumes varied throughout the year, with increased call volumes when children were returning to school in September or transitioning to secondary school. The majority of calls resulted in successful outcomes, with parents and families reporting increased confidence and improved management of their allergy.

**Conclusions:** Overall, our findings demonstrate the importance and benefits of non-emergency access to a paediatric allergy nurse telephone service, for patients and their families. This service provides a valuable resource for families dealing with paediatric allergies, increasing access to expert advice and improving health outcomes.

### A150 | Remote consultation opportunities in paediatrics allergy: A QIP project

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**Objectives:** The British Society for Allergy and Clinical Immunology recommends that in many cases outpatient services can be delivered remotely (1). Benefits include easier continuity of care and improving access for high-risk patients unable to travel. There is a national NHS target to reduce the outpatient follow ups by 25% (2). Additionally, as a trust, we have a 25% target for the proportion of outpatient appointments performed remotely across East Cheshire. This is the first cycle of the project, designed to establish a baseline.

**Method:** A report was gathered by the outpatient system for the time between 01/04/22 and 31/08/022 for all the Paediatric outpatient appointments. The appointment occurred either face-to-face or remote (video or telephone). The data was anonymised within a Microsoft Excel spreadsheet and subsequently processed and analysed.

**Results:** Macclesfield General District Hospital is not meeting the current remote outpatient appointment requirement in the paediatric department. The only department which met the criteria was Paediatric Allergy clinics. Overall, only 6% of outpatient appointments were non F2F. 96% of overall paediatric appointments were face to face.

**Conclusions:** In conclusion, there is a missed opportunity to provide patients with the benefits of remote consultations. We will interview Paediatric consultants on remote consultations and address issues identified. We will have departmental education on remote consultations through our newsletter. We also aim to gather patient questionnaires on their experience of remote consultations when they did happen. After 2 months we will perform a re-audit to evaluate effectiveness of interventions, and hope that more remote consultations are taking place. We also hope that this practice is replicated at other hospitals.

### A151 | 20% increase in Paediatric Allergy clinic capacity by introducing a pre-appointment clinical questionnaire

Serena Braccio; Penny Salt; Dalbir Sohi
*University College London Hospitals NHS Foundation Trust, London, UK*

**Objectives:** Most of the Paediatric Allergy appointment time is spent by documenting the clinical history of patients seen for the first time in clinic. A focused allergy history available before the clinic would reduce the appointment time and allow the clinician to request allergy testing before seeing the patient, making the patient flow smoother and more coordinated.

**Method:** We created a Paediatric Allergy focussed clinical questionnaire and distributed to patients and carers waiting for their first Paediatric Allergy appointment. The patients brought the completed questionnaire to the doctor who completed the appointment with a physical examination and request of diagnostic tests.

**Results:** We have received 16 patients' and carers' feedback on the use of this questionnaire. Many patients found the questionnaire useful in helping them focus on the specific problems to discuss in clinic. They also reported the questions were easy to understand (even when English was not their first language) and the average time to complete the questionnaire was between 5 and 10 min. We have changed format and wording of some questions based on specific feedback received by patients. Doctors' feedback was that the use of the questionnaires reduced the appointment time by 10 min on average. In a 6-patient clinic, this allows to see 1.5 extra patients per clinic, increasing the clinic capacity by 20%. In our service, this translates to over 300 extra appointments per year.

**Conclusions:** By working with the Electronic Patient Record team, we are planning to integrate the questionnaire in the clinic appointment letter in an electronic format. This way the questionnaire can be completed electronically by the patient days before the appointment, integrated in the clinical notes and reviewed by the clinician in advance, which would allow the doctor to request allergy testing before seeing the patient.

### A152 | Patient-responsive paediatric allergy care pathways: Creating safe and efficient acceptance, discharge and rejection criteria for referrals

Serena Braccio[1]; Penny Salt[1]; Natalie Bishop[2]; Louise Long[1]; Sean Harrison[1]; Dalbir Sohi[1]
*[1]University College London Hospital, London, UK; [2]University College London, London, UK*

**Objectives:** Due to our long waiting list, we have lost our ability to be responsive to patients who are at risk of severe allergic reactions due to delay in diagnosis or those with multi-allergic disease affecting their quality of life. With this quality improvement project, we aimed to improve allergy referral triage and create resources for GPs and patients when a referral is rejected by the allergy team.

**Method:** By discussing within the multi-disciplinary paediatric allergy team in our Trust and local GPs, we created a list of acceptance, rejection and discharge criteria for referrals to our paediatric allergy service. These criteria are aligned with established guidelines and patient information leaflets from BSACI, NICE, Allergy UK and Anaphylaxis UK. We created 1-page letters for each of the rejection criteria including advice on management of simple allergy conditions in primary care.

**Results:** In the month of May 2023, we received 63 referrals to the paediatric allergy service. 21 (33.3%) were rejected. Five (23.8%) were already known to another paediatric allergy service. Four (19.0%) resided outside the Greater London area and were directed to local allergy services. Five (23.8%) had acute urticaria, three (14.3%) had pet allergy, one (4.8%) had each of the following: irritant contact reaction, delayed cow's milk protein allergy, simple eczema

and food pollen allergy. Information accompanied the rejections to enable GPs to manage these conditions in primary care.

**Conclusions:** This work reduces NHS duplication, directs patients to local services and aligns itself with the NHS plan to appropriately redirect out-patient work to the community/primary care, with adequate secondary/tertiary support, with the aim to reduce outpatient clinic waiting time for patients. We are now assessing the acceptability of this process and exploring ways to improve the process further with GPs to best support patients' needs.

### A153 | Clinical snapshot of allergic disease management from clinic attendance at a district general hospital allergy clinic

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*Worcestershire Acute Hospitals NHS Trust, Worcester, UK*

**Objectives:** To identify the disease spectrum of patients seen in a paediatric allergy clinic. Clinic presentation is often varied, and some patients may have a single problem, for example food allergy whereas other patients may have poorly controlled eczema, asthma and rhinitis as well. With an increasing reliance on nurse led clinics we aimed to better identify what allergic diseases were being managed, by whom and at what age in a district general hospital paediatric allergy clinic.

**Method:** All patients attending allergy clinic were monitored for 5 months between May 2022 and end of the January 2023. A proforma was filled documenting which diagnoses were addressed during the clinic appointment.

**Results:** 356 patients were seen in the combined 5 month periods. 47% of patients were new patients. Children aged under three represented 38% of clinic with 95% of these presenting with food allergy. These were presenting with one (58%) or two (36%) problems. Children aged between 6 and 11 were most likely to require management of three, four or five clinical problems (49%) rather than one or two (51%). In those aged over 11 years problems were limited to one or two (67%). Teenagers represented only 14% of clinic attendance.

**Conclusions:** These results demonstrate multiple problems presenting to allergy clinic and the time taken to address all of these issues thoroughly can be challenging. These diagnoses are not always identified at triage and therefore difficult to correctly allocate to nurses or consultants according to their skill sets. The increasing presenting problems come when children are undergoing a shift to parental separation and educational transition. A proforma for allergy clinic referral has been introduced to better identify clinical allocation and a teenage food allergy education session to target the underrepresented adolescents.

### A154 | Prioritisation of infants in allergy clinics: A regional audit

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**Objectives:** *Aims*: Studies have established early introduction of allergenic foods in high-risk infants can prevent allergy development. To assess the effect of early intervention allergy clinics in the Southwest, we conducted a region-wide audit. Our audit investigated whether prioritisation of infants (aged 12 months and under) in allergy clinics led to reduced wait times for these high-risk infants.

**Methods:** Seven hospitals were sent requests for year-on-year data between 2019 and 2022 on: number of infants seen in allergy clinic, waiting times and clinic provision details. Data were analysed by paired *t*-tests using SPSS.

**Results:** Six hospitals responded, two of which were excluded due to low patient numbers. These four hospitals prioritised infants from 2021 or 2022 and provided a multidisciplinary team clinic at first appointment, with one hospital offering food challenges on the same day.

The average waiting time decreased following prioritisation from 77 ± 257.5 to 38.5 ± 45.5 days ($p < 0.05$). More infants were seen in clinics following prioritisation ($p < 0.05$), with 122 infants seen annually across all hospitals pre-prioritisation increasing to 239 post-prioritisation.

Most units agreed that prioritising infants negatively impacted waiting lists for over 1 s in general allergy clinic, with the average waiting time increasing from 77 ± 257.5 to 364 ± 61 days ($p < 0.05$).

**Conclusions:** This audit highlights that prioritisation of infants can significantly decrease waiting times in this vitally important age group. However, without increasing services as a whole, this negatively impacts other age groups. This may also be biased by the COVID-19 pandemic increasing waiting times.

Future audits will assess the impact of infant clinics on the percentage of food allergies compared to regionally expected numbers of allergies. This would aid funding of infant clinics to save money by actively working on reducing the burden of food allergy.

### A155 | Review of children's transition to adult services in the paediatrics allergy/immunology department

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**Objectives:** The objectives of the study were to review the department compliance regarding children's transition/transfer to adult service against the standards and to improve the quality of documentation of the timing, plans, children competency check tools and introduction to the adult team in patients' records.

**Method:** A retrospective study in which the outcome of 90 cases (76 patients with atopy, 2 with urticaria, 3 with HAE and 9 with

immunodeficiency) who were 17 years or older (born 2002–2004) in the year 2022 was reviewed. The assessment was conducted against 4 NICE guidance (ng43 and qs140) standards which are adopted locally.

**Results:** In the year 2022, 95.6% of the reviewed cases had transition/transfer completed, and 4.4% were under follow-up. 58% of cases joined the service <13 years of age, and 42% joined ≥13 years old. Transition/transfer was completed at around the age of 18 years in half of all cases.

87.7% of cases were on injectable medications and/or immunotherapy. Of those cases, 64.6% were in possession of Adrenaline autoinjectors, 26.6% were on immunotherapy, 3.8% were in Immunoglobulins, 3.8% were on C1 Inhibitors, and 1.2% were on Monoclonal antibodies.

Standard 1 (start transition plan) was achieved in 11.3% of the cases who joined the service younger than 13 years and in 23.7% of cases who joined the service ≥13 years. Standard 2 (annual review) was met in 52.2% of the cases. All cases met standard 3 (a transition named worker). Standard 4 (meet the adult service before transfer) was met in 43.3% of cases.

**Conclusions:** Concern that 3 out of 4 standards were met in less than 70% of cases. Good documentation of the transition plan, timing, and outcome is an important reflection of the department's transition practice which could be facilitated by the development of service-specific tools.

## A156 | Virtual reality intervention for paediatric skin prick testing: Reducing anxiety and improving workflow efficiency

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*Imperial College NHS Healthcare Trust, London, UK*

**Objectives:** This study aimed to assess the feasibility and impact of utilising virtual reality therapy (VRT) during skin prick testing (SPT) in paediatric patients. The objective was to evaluate the perceived effectiveness of VRT in reducing anxiety and time-procedure during SPT.

**Method:** A prospective study enrolled 21 paediatric patients (5 to 18 years-old) undergoing SPT at the Paediatric allergy unit at St. Mary's Hospital. Nurse selection identified anxious and previously difficult-to-test children. During the procedure, patients were offered a Rescape device DR.VR™ headset, which provided a calming environment. Pre- and post-procedure anxiety levels were assessed using a visual analogue scale. Acceptance and satisfaction with VRT were evaluated through post-intervention questionnaires. Healthcare-professionals were surveyed on procedure time.

**Results:** There was a significant reduction in anxiety levels following the implementation of VRT during SPT, with an average reduction of 77.4%. This reduction was statistically significant, as confirmed by the Wilcoxon signed-rank test ($p = 0.0012$). The majority of participants (83.3%) agreed to use VRT, reporting significantly decreased anxiety scores after the intervention. Furthermore, 92% of participants expressed positive experiences with VRT, finding it helpful in creating a calmer environment. Moreover, 85% of the patients expressed their desire to use VRT again for future procedures. Regarding time reduction, healthcare professionals perceived that in 16 out of 21 patients, the use of VRT reduced the overall duration of the procedure.

**Conclusions:** Integrating VRT into SPT for paediatric patients is feasible. VRT demonstrated significant anxiety reduction and potential for enhancing the patient experience. Healthcare-professionals' feedback regarding time reduction perception further supported the benefits of VRT. However, a larger sample, standardised measures and randomised trials are needed to validate these findings. Nonetheless, positive outcomes highlight the potential of VRT in improving patient comfort, engagement, workflow-efficiency and overall experience during SPT.

We acknowledge the support of Rescape for providing the DR.VR™ device.

## A157 | Case report: Chronic spontaneous urticaria—Off licence use of omalizumab in a 4-year-old

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**Objectives:** *Background*: Chronic spontaneous urticaria (CSU) can occur in all age groups though there is limited data for incidence and management in those under 12 years old. Omalizumab is currently only licensed for children aged 12 and over in the management of CSU for those who are unresponsive to maximum dosing of second-generation anti-histamines. This case presentation reports the treatment of a patient aged 4 years with omalizumab for his CSU.

**Method:** *Case Presentation*: The patient started developing unprovoked episodes of urticaria with up to 20 wheals a day and facial angioedema with a background of eczema, asthma, allergic rhinoconjunctivitis, allergies to egg, milk and peanut. There were no family pets and no suggestion of vasculitis. This was unresponsive to loratadine, given four times a day and montelukast. In view of the background allergies, there were multiple unscheduled Emergency Department (ED) attendances with urticaria. On two occasions, intramuscular adrenaline was administered when incessant itch and urticaria caused the child to hyperventilate, causing an overlap of symptoms of anaphylaxis. It caused him significant anxiety, lack of sleep and multiple missed days from pre-school, threatening his mother's employment. Due to worsening symptoms, despite maximal anti-histamine therapy, the patient was started on off licence omalizumab following individualised funding request approval.

**Results and Discussion:** With omalizumab use the need to attend ED resolved. Pre-school attendance and sleep markedly improved.

Urticaria activity score 7 showed improvement from 35 to 24 by week six after commencing monthly omalizumab 150 mg subcutaneous injections. There have been no adverse effects of the treatment, which was tolerated with play therapists involvement.

**Conclusion:** Although there have been case studies showing benefit from use of omalizumab in younger patients there is a paucity of large-scale studies. Extension of licensing for use of omalizumab in under 12-year-olds with CSU would be useful.

## A158 | Unusual cases of raised mast cell tryptase in three paediatric patients

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**Objectives:** *Background*: Serum tryptase is a marker of mast cell degranulation which can be raised in conditions such as systemic mastocytosis, myelodysplastic syndromes and chronic kidney disease, in addition to being an indicator of acute anaphylaxis.[1] NICE guidelines advise mast cell tryptase should be measured as soon as possible after anaphylaxis is suspected in certain circumstances, and further samples at an interval.[2] However, here we set out 3 cases where elevated tryptase added to the diagnostic dilemma.

**Method:** *Case Presentation*

1. A 16-year-old female presented with 12 episodes of varying symptoms including throat tightening, loss of consciousness, rash and altered sensation without any obvious trigger. Examination was normal, except for hypotension, recorded as low as 45/29, on 3 occasions. Her serum tryptase rose from 8 to 20 μg/L on one occasion.
2. A seven-month-old male presented with a diffuse bruise like rash and facial swelling several days after completing a course of amoxicillin. He was treated with antihistamine and oral steroids and the rash resolved over 1 week. Serum mast cell tryptase was 28.8 μg/L.
3. A 7 month old infant presented with an acute severe reaction to cow's milk formula. An initial serum tryptase, collected by the emergency team, was elevated at 15 μg/L. Subsequent measurements remained elevated. The infant suffered with intermittent abdominal pain and loose stool on a dairy-free diet.

**Results and Discussion:** All cases have undergone extensive investigation to clarify clinical relevance of serum tryptase. We will present a guide to judicious measurement and investigation of elevated serum tryptase.

**Conclusion:** Mast cell tryptase can be elevated in a range of conditions and non-allergic causes require careful consideration.