Learning Pack: Paediatric Allergy

This learning pack can be used for local teaching and for individual reading and reflection. Several activities have been designed and they have been mapped to the RCPCH Progress curriculum.

Feel free to use any or all of this pack in your department. If you wish, you can reflect on the learning activity and upload to your e-portfolio linking to the relevant domains. Other learning packs are available on https://londonpaediatrics.co.uk/.

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1.0 Anaphylaxis

Objectives

- Identify anaphylaxis reaction and manage as per APLS protocol
- Practise correct prescription of Adrenaline Auto-Injectors (AAI)
- Practise safe and correct administration of AAI
- Practise completing and explaining an Allergy Action Plan (AAP) for a child discharged after a proven or suspected anaphylaxis reaction

Activity 1: Simulation Session: Child with acute shortness of breath and wheeze

Facilitator: Cons/trainee with debriefing skills Participants: SHOs, SpRs, Nurses

Instructions for facilitator: The simulation (15 mins) can be a low fidelity simulation depending on resources available. History provided only if actively asked through calling parents or coach. If appropriate management not instituted promptly, child deteriorates. Facilitate debrief session (30 mins), include technical skills as well as human factors and identify as a department if there are any latent errors.

Instructions for participants: The triage nurse has called you because she is concerned about the observations for this 8 year-old boy with shortness of breath while playing sports. He is here with his football coach.

Set up: ED in DGH with access to resus area, resus trolley, anaphylaxis protocol and box and telephone for escalation of care.

Case for facilitator only:
Adrian Sahil, NHS 700 453 694, DOB 18/08/2012, Weight 34Kg

- 8-year-old Adrian presents with acute shortness of breath. He was at a sports holiday club and presented with his football coach. He became short of breath and wheezy after lunchtime break. He has asthma and was last seen in asthma clinic a year ago. The respiratory team were happy with his progress. He is on a brown and blue inhaler. He has never been admitted to PICU. He is allergic to eggs and some tree nuts (awaiting testing for confirmation). He has never had anaphylaxis and doesn't have an Epipen. His parents are on their way to hospital. Please assess Adrian and manage him as appropriate.
- Observations: HR 180, BP 89/55, O2 Sats 89%, T 36.5, RR 48
- Examination: Prolonged expiration, B/L audible polyphonic wheeze, increased work of breathing with subcostal and intercostal recession. Speaking in broken sentences. Seems anxious. Pale. Weak and thready pulse, CRT 4 secs

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Participants are expected to:

- Assess child systematically and treat accordingly
- Maintain effective communication with child, carers and resuscitation team
- Lead and work effectively as a team
- Escalate appropriately

Further reading

Montgomery S et al, 'Alert to Anaphylaxis' on Paediatric Foam has an easy to read case based acute presentation of anaphylaxis, mast cell tryptase measurement, biphasic reaction and discharge following anaphylaxis

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Activity 2: Safe Prescription and dosing of AAI, administration of AAIs and use of Allergy Action Plan

Each activity can be carried out independently as a part-task 10-15 minutes session or together as a 45 minutes practical session rotating between three stations.

Activity 2.1 : Prescribe Adrenaline Auto-Injector (AAI)
- Group/individual activity +/- Pharmacist

Activity 2.2 : Administration of AAI
- Group activity of reviewing and practising the correct method of AAI administration using different devices.

Activity 2.3 : Explaining and completing an Allergy Action Plan
- Group/individual activity +/- allergy nurse

2.1 Prescription of Adrenaline Auto-Injector (AAI)

Equipment: In-patient and out-patient prescription chart, Calculator, BNFc

The preferred use of adrenaline in anaphylaxis resuscitation is via an AAI to avoid delay and potential dose calculation error.

- Specify which device and dose you want to be administered for an in-patient
- When making an out-patient prescription / TTA, specify the number and type of devices to be supplied

Example: Emerade Adrenaline Autoinjector , 0.3mg IM Supply two devices

Age	Dose and volume using 1 mg/mL adrenaline (= 1 in 1000)
Adult or child > 12 years[b]	0.5 mg (= 0.5 mL)
Children aged 6–12 years	0.3 mg (= 0.3 mL)
Children < 6 years[c]	0.15 mg (= 0.15 mL)

- [b] 0.3 mg if child small or pre-pubertal.
- [c] RCUK recommended dose for 6 months–6 years.

Source : BNF , Resuscitation Council

Further reading : BSACI guideline: prescribing an adrenaline auto-injector

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2.2 Administration of AAIs

Equipment: JEXT, EMERADE, EPIPEN training devices

A systematic literature review of patients, parents and healthcare professionals adrenaline auto- injector administration techniques reveal that overall only 37% of patients, 32% parents/caregivers and 21% of healthcare professionals demonstrated correct administration technique

El Turki A, Smith H, Llewellyn C*, et al* A systematic review of patients', parents' and healthcare professionals' adrenaline auto-injector administration techniques *Emergency Medicine Journal* 2017;**34:**403-416.

Below are video links to illustrate the correct method of using AAIs

JEXT EMERADE EPIPEN

2.3 Explaining and completing an Allergy Action Plan (AAP)

Equipment: Printed Allergy Action Plan
Facilitator: Consultant, Asthma or Allergy Specialist Nurse
Participant: SHO or SpR (candidate and parent)

Instructions for facilitator: Encourage participant to review and complete an AAP independently and then explain to a parent its purpose and steps to take in an emergency.

Instructions to participant: Complete an AAP and explain the steps in recognising and managing possible anaphylaxis attack.

Each child who is seen for a suspected or proven allergic reaction needs to be given a clear **Allergy Action Plan**. One copy to be given to the parent and carried with the child at all times and one to be given to school.

It is a good point in time to ensure parent and child understand actions to be taken if/when an emergency occurs. BSACI Allergy Action Plan templates for personalisation depending on AAIs prescribed.

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2.0 Eczema

Activity 3: Communication Scenario on Eczema

Objectives

- Communicate effectively with parents addressing their concerns
- To understand the practical as well as medical management of eczema
- To understand the role of allergy testing in non-infantile eczema

Facilitator: Consultant **Participants:** SHOs

Equipment: Guidance on marking and station for MRCPCH Clinical

Instructions for facilitator: Set up a communication scenario following the structure and timing of MRCPCH Clinical with candidate and parent. Lead on feedback and discussion.

Instructions for observers: Consider the verbal, non-verbal communication and accuracy in information delivered.

Instructions for candidate: Read through the case below and counsel the parents on the appropriate management for their child.

Case:
A five-year-old girl, Elena is referred to clinic, due to their moderate-severe eczema which started two years ago. Areas affected are her arms and legs flexures which are very inflamed. There is some lichenification in her antecubital fossa. Her parents have tried a few different creams with no success, and they have stopped using emollients. Elena's parents are really worried that food allergy is responsible. They have come to clinic to request allergy testing. She has no symptoms of immediate food allergy reactions.

Discussion points to consider:

- How likely is allergy to be a factor in Elena's eczema?
- Would you do any allergy testing?
- What practical advice can you give them on her eczema management?
- Write a management plan for this girl's eczema

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Elena's Parent:
You have been managing Elena's eczema for the last two years and are worried none of the treatments have made any difference. Elena doesn't like the creams and you have stopped using them as they didn't seem to work. You would like to test Elena for food allergies as you suspect they contribute towards her eczema like her 7 month old cousin.

Further reading:

Eczema Top tips!
The older the child, the less likely allergy is a causal factor in their eczema. Food triggers of eczema tend to be more of food intolerance and not a true IgE mediated allergic reaction. Therefore, skin prick testing is less likely to be helpful in determining food triggers. Children with eczema tend to have raised IgE and therefore specific IgE tests are frequently positive in the absence of true clinical allergy. The only way to diagnose an allergic precipitant of eczema is to start a restriction diet to assess for improvement, followed by a planned reintroduction to confirm the diagnosis. Restrictive diets are not generally recommended in the treatment of eczema with the exception of cow's milk protein allergy, diagnosed in symptomatic infants. Restrictive diets should only be considered with the help of a dietician/allergy team to avoid nutritional deficiencies.

www.eczema.org Wealth of information on types, treatments and triggers of eczema including excellent patient fact sheets, support groups and helpline.
Emollient prescribing guideline (Southwark NHS CCG) Excellent resource on different types of emollients, practical considerations and recommendations for use.
www.itchysneezywheezy.co.uk Great patient -friendly videos on eczema and how to apply emollients.
BSACI: house dust mite avoidance Practical advice on reducing house dust mites.
NICE Guideline on Atopic Eczema in under 12s Diagnosis, management and referral criterias.

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Activity 4: Quick Teach on food allergy and infantile eczema prevention

Objectives

- To update on current recommendations on early introduction of food in children at high risk of developing IgE-mediated food allergies.
- To deliver an evidenc- based teaching session.
- To reflect on teaching practice based on feedback from the audience.

Group teaching

Participant: SpR **Attendees:** Consultants, SHOs, Nurses, AHPs

For SpR - use feedback form using 5 point likert scale and free text.

Instructions to attendees: Participate in teaching and discussion, taking note on teaching style. Provide constructive written feedback on teaching skills.

Instructions to participant: Prepare a 15 minute teaching session using the reading list below. Facilitate a 10 minutes discussion and address any questions from the audience. Reflect on teaching experience on e-portfolio.

Topic to explore:

Advice given to parents of infants at increased risk of developing eczema and IgE-mediated food allergies during their first year of life.

Further Reading:

- Powell, L and Kelleher, M. To Eat? to Leap? Paediatric FOAMed
- BEEP study on eczema prevention
- LEAP study on early introduction of peanut in high risk infants
- EAT study on early introduction of allergenic food in high risk infants

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3.0 Food Allergy

Activity 5: Case Based Discussion on young child with multiple food allergies

Objectives:

- Identify food reactions which are indicative of immediate food allergy and warrant investigations
- Organise multi-disciplinary team management of young child with multiple food allergies

Case based Discussion: Group discussion or individual reflection

Facilitator: Consultant, dietician or allergy nurse **Participants:** SHOs, SpRs

Instructions for facilitator: Support and chair discussion of case

Instructions for participants: Read through the case below and discuss each clinical question

Case: Toby Tann, DoB 13/12/2014, Weight 16kg

- Location: General Paediatric Outpatient clinic
- 5-year-old Toby has been referred to the general paediatric team by his GP with concerns about possible food allergies. Toby's parents are currently excluding eggs, cow's milk, nuts and fish from his diet.

- **What specific questions do you want to ask Toby's parents in clinic?**

  When Toby had scrambled eggs for the first time, he vomited straight away and refused to eat them again. He does not eat eggs in any forms (raw, loosely cooked, well cooked, or baked). He drinks almond milk as cow's milk gives him eczema flare. However, he eats yoghurt and cheese with no problems. The first time he ate salmon he developed a blotchy rash all over his body 30 minutes later

and was very upset so parents are not giving him any fish. Toby's parents have never tried to give him nuts, as they are scared he might have a reaction.

- They are also concerned that Toby often looks bloated after a meal but they have not been able to identify a possible food associated. He opens his bowels following straining every 2-3 days (type 1 on stool chart).
- Toby was born at term weighing 3kg. He was solely breastfed until 6 months when parents started weaning onto solids. While breastfed, his mother was on a full diet, he was gaining weight following his growth centile and was not described as a sickly or colicky baby. He developed eczema at around 3 months of age. This was treated by his GP with mild topical steroids. Toby's father has hay fever and asthma, his mother has had eczema when younger. Toby is an only child.
- On examination, Toby is happy and looks well. He has normal respiratory and cardiovascular examination. On abdominal palpation, you find faecal loading in the left iliac fossa. There are no physical evidence of anaemia. He has mild eczema (dry erythematous skin) in his popliteal, antecubital fossae and abdomen. His development is appropriate for his age. His weight plots on the 9th centile for age.

- **Based on the clinical history and examination findings, what is your working diagnosis and what investigations would you like to perform?**
- **What resources can you use to guide you through investigation and management of a child with food allergies?**
- **Which healthcare professionals would you like to involve in the management of this child's allergies and eczema?**
- **Do you know of any patients' groups or websites you can suggest to parents to seek support and information?**

Resources on food allergy diagnosis, management and support

RCPCH Allergy Care Pathway for Food Allergies

NICE Guidelines Overview | Food allergy in under 19s: assessment and diagnosis | Guidance

Types of Food Allergy | Information on Top 14
Food Allergy | Resources to Help You | Food Labelling

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3.1 Cow's Milk Protein Allergy (CMPA)

Objectives

- To understand the presentation of non-IgE mediated cow's milk protein allergy
- To practise counselling a parent in performing a dairy free exclusion and perform a home reintroduction
- To understand some of the milks available and when these are used
- To identify who may need referral to a specialist

Activity 6: Quiz !

An 8 part Quiz, which can be done in teams (with prizes for motivation!) or individual reflection. A dietician would be best to facilitate discussion.

Q1. Which milks are suitable for a 6-month-old child with non-IgE mediated CMPA?

Q2. Which milks are suitable for a 1 year old with non-IgE mediated cow's milk allergy?

A	B	C	D	E
F	**G**	**H**	**I**	**J**

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Q3. Which symptoms are IgE Mediated and which are Non-IgE mediated?
Tick the relevant box

	IgE	Both	Non IgE
Wheeze Eczema PR bleeding Constipation Catarrhal airway sx Failure to thrive, Skin erythema Abdominal pain Acute rhinitis Food refusal/aversion Urticaria Angioedema Vomiting Diarrhoea Conjunctivitis Colic			

Q4. Does it contain milk? Find the hidden milk containing products below

A	B	C	D	E	F
G	**H**	**I**	**J**	**K**	**M**

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Q5. If a maternal exclusion diet is recommended, what vitamin supplementation does the mother require?

Q6. Post ingestion of dairy, what time frame would you expect to see symptoms in a non-IgE mediated cow's milk protein allergy?

Q7. You see a 6 month old baby in clinic, with a 2 month history of mucus and blood tinged stools, abdominal pain, and diarrhoea. The mother exclusively breast fed for 4 months and then added in some formula, she has just started weaning with baby porridge and fruit purees. What would you advise?

A) EHF + maternal dairy free diet
B) EHF normal maternal diet
C) Amino acid Formula + maternal dairy free diet
D) Amino acid formula and normal maternal diet.

Q8. How do you confirm a diagnosis of non-IgE mediated cow's milk protein allergy?

Quiz Answers

1. A – Yes in cooking and meals, if not soya allergic B- Yes C- Yes D- Yes in cooking and meals E – No F- No G- Suitable but not a first line choice
H- No I – Yes in cooking and meals J – Yes but not as a first line
2. A-Yes if not soya allergic, B- Yes, C- Yes, D- Yes, E- No, F- No, G – Yes but consider trial of EHF if over 1 year as this may now be tolerated.
H – No I- Yes this could be considered, fortified versions are better J - Yes but consider trial of EHF if over 1 year as this may now be tolerated.
3.

	IgE	Both	Non IgE
Wheeze	x		
Eczema		x	
PR bleeding			x
Constipation			x
Catarrhal airway sx			x
Failure to thrive,			x
Skin erythema		x	
Abdominal pain		x	
Acute rhinitis		x	
Food refusal/aversion			x
Urticaria	x		
Angioedema	x		
Vomiting		x	
Diarrhoea		x	
Conjunctivitis	x		
'Colic'		x	

4. A- No but it does have soya, B- Yes, Ghee is made from clarified butter, C- No, D – Yes it contains butter milk, E- Yes, F -No G- No added milk, May contain traces of milk, H- Yes, I – No J – Yes K – Yes L- No
5. Calcium 1000mg per day, Vitamin D 10 micrograms day (400IU)
6. 2-72 hours
7. B 8. If there is an improvement in symptoms following an exclusion diet, followed by a return of symptoms after a reintroduction

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Activity 7: Communication Scenario on non-IgE mediated Cow's Milk Protein Allergy

Facilitator: Consultant/Allergy Dietician **Participants**: SHOs

Equipment: Guidance on marking and station for MRCPCH Clinical

Additional Resource on MRCPCH clinical communication station

Instructions for facilitator: Set up a communication scenario following the structure and timing of MRCPCH Clinical with candidate and parent. Lead on feedback and discussion.

Instructions for observers: Consider the verbal, non-verbal communication and accuracy in information delivered.

Instructions for candidate: Read the case and follow the candidate instructions.

Case

An exclusively breast-fed 3-month-old infant, Sophie is brought to ED. She has significant widespread mild to moderate eczema. Her mother reports mucus-containing stools that are looser than expected, 8 times a day. She has been unsettled after feeds and you suspect non-IgE mediated cow's milk protein allergy.

Counsel Sophie's parent on the working diagnosis and management plan.

Points to consider in your discussion:

- An explanation of cow's milk protein allergy and its prognosis
- Discuss maternal exclusion diet and the process of reintroduction.
- When would you expect to see improvement in the baby's symptoms?
- Consider maternal vitamin supplementation.
- What options are available if the mother wishes to introduce formula?
- What follow up and further support will be required?
- How will you manage the eczema?

Sophie's Parent

You are very worried about Sophie as she always seems uncomfortable. You want to know if you can carry on breastfeeding or if this is harmful for Sophie, if Sophie will outgrow her allergy and when she will start feeling better. If the doctor discusses reintroducing dairy into her diet explain that you are very reluctant to do this because Sophie's symptoms have been very distressing. You are also concerned about Sophie's skin and would like to know what can be done to improve it.

Activity 8: Flipped classroom group discussion on CMPA

Facilitator: Cons/SpR **Participants:** SHOs, AHPs, medical students

Instructions for facilitator: Lead a 20 minutes group discussion on non-IgE cow's milk protein allergy. Ensure the group has had a chance to read the recommended reading.

Facilitator to take the group through the following questions:

- What are the differences between the presentation of colic, reflux and CMPA?
- What are the benefits of reintroducing dairy to confirm the diagnosis?
- In what circumstances is a trial of reintroduction of dairy, not recommended?
- How quickly do children tend to outgrow non-IgE cow's milk protein allergy?
- When would you consider referral to a specialist?
- What alternative milks are available and when can you use them?

Instructions for participants: Read the documents listed and participate in discussion to deepen understanding of subject matter.
iMAP CMPA guideline
BSACI Guideline on Milk Allergy

Further Resources on CMPA
Levene I, Anthony M: Cry Baby Cry… Part 2 (Colic, CMPA and Reflux) A good summary of colic, reflux and allergy.
The iMAP Allergy-focused Clinical History for Suspected Cow's Milk Allergy in Infancy 'The Cornerstone of the Diagnosis'
Early Home Reintroduction to Confirm or Exclude Diagnosis A guide on how to reintroduce dairy
BDA Dairy-free diet A great guide on dairy free diets for the child and mother.
Allergy UK Patient Leaflet CMPA Leaflet to aid dairy free diets.
THE iMAP MILK LADDER BSACI IMAP milk ladder for reintroduction