CLINICAL PRACTICE GUIDELINES

FOOD ALLERGY

DIAGNOSIS AND MANAGEMENT

EXECUTIVE SUMMARY

2nd EDITION (2026)

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COLLEGE OF PAEDIATRICS AND CHILD
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COLLEGE OF PAEDIATRICS AND CHILD HEALTH, SINGAPORE (CPCHS)

CLINICAL PRACTICE GUIDELINES ON FOOD ALLERGY: DIAGNOSIS AND MANAGEMENT

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This guideline has also received formal endorsement from the College of Family Physicians Singapore (CFPS) and the Chapter of Family Medicine Physicians, Academy of Medicine, Singapore. We would like to thank the members for reviewing and providing feedback on this guideline.

These guidelines were also reviewed by SPEAK (Singapore Parents of Eczema and Allergy Kids) to ensure that the perspectives of patients and caregivers were appropriately represented. SPEAK supports the dissemination and implementation of these guidelines to promote evidence-based care for individuals with food allergy and their families.

We also sincerely thank all healthcare professionals, patients, caregivers and members of the public who participated in the public consultation process. Their thoughtful feedback and constructive comments helped to refine and strengthen the final guideline.

The CPG Workgroup gratefully acknowledges the institutional support provided by the various organisations and agencies that our workgroup members represent. We particularly recognise that all workgroup members contributed substantial personal time and effort to this CPG without specific remuneration, demonstrating their unwavering commitment to improving the diagnosis and management of food allergies for the benefit of children and families in Singapore and beyond. We also acknowledge our medical writer Ms Lee Sook Yee for her meticulous proof reading.

The collaborative spirit and dedication of all contributors have made this comprehensive guideline possible, and we trust it will serve as a valuable resource for healthcare professionals caring for patients with food allergies.

A/PROF ELIZABETH THAM and **DR KOK WEE CHONG**
CPG WORKGROUP CO-LEADS
[JUNE 2026]

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GENERAL INTRODUCTION

Food allergy is an increasingly recognised public health concern in Singapore.[1] Local studies estimate a prevalence of approximately 2.9% to 4.0% based on self-reported data, comparable to other Asian populations.[2-4] Food allergies are immune-mediated adverse reactions to food that can manifest across a spectrum of severity, ranging from mild cutaneous symptoms to life-threatening anaphylaxis.[5, 6] The most common food allergens in Singapore include hen's egg, cow's milk, peanut, tree nuts, shellfish, wheat, fish and soy, with hen's egg allergy being particularly common among young children.

Accurate diagnosis and effective management are essential to reduce the risk of severe allergic reactions and to improve quality of life. Food allergies impose a substantial burden on patients and families, including dietary restrictions, social limitations, anxiety related to food consumption, and the need for constant vigilance to avoid allergens. The psychosocial impact extends beyond affected individuals to families, schools, and social environments, highlighting the importance of coordinated, evidence-based care.[7-9]

Singapore's diverse population and cultural practices also give rise to unique allergenic exposures and clinical presentations that necessitate locally relevant guidance. These include bird's nest allergy, galacto-oligosaccharide (GOS) allergy associated with certain powdered milk formulas, and shellfish allergy related to tropomyosin cross-reactivity.[10-12] Such patterns underscore the need for clinical guidance that reflects Singapore's epidemiology, cultural context, and healthcare environment.

The first Academy of Medicine, Singapore–Ministry of Health (AMS–MOH) Clinical Practice Guidelines on Food Allergy were published in 2010.[13] Since then, the field of food allergy has advanced considerably, particularly in areas such as allergy prevention, diagnostic approaches, and emerging therapeutic options. These developments necessitate an updated set of evidence-based recommendations.

This revised guideline provides comprehensive, evidence-based recommendations to support healthcare professionals in the recognition, diagnosis, and management of food allergy across all age groups in Singapore. The recommendations have been developed with careful consideration of the local healthcare context, including resource availability, cultural acceptability, and implementation within Singapore's healthcare and educational systems. The workgroup comprised multidisciplinary representatives from multiple institutions and sectors, ensuring that the recommendations are relevant, balanced, and applicable across clinical settings.

As the understanding of food allergy continues to evolve, this guideline aims to support consistent, evidence-based practice and ultimately improve patient outcomes and quality of life for individuals living with food allergy in Singapore.

PRIMARY OBJECTIVE

The primary objectives of these guidelines are to:

1. Provide updated, evidence-based clinical practices suitable for use in the Singapore context.
2. Promote effective healthcare for patients with food allergies across all age groups through application of these evidence-based clinical practices.

These guidelines were written to provide healthcare professionals with evidence-based recommendations to support them in the diagnosis and management of food allergies and food-induced allergic reactions in the Singapore healthcare setting. Furthermore, guidance on how medical professionals can work together with parents, caregivers, teachers and other school personnels to manage children with food allergies is also provided.

TARGET POPULATION

The target population covered by these guidelines is patients of all ages with food allergies. Where appropriate, some of the guidelines may focus on children or breastfeeding mothers as food allergies tend to develop in early childhood.

TARGET USERS

The target users of the guidelines are all professionals caring for patients with food allergies in Singapore (e.g., general practitioners, paediatricians, allergists, nurses, dietician), as well as parents, educators, caregivers, and school personnel. The intent is for the guidelines to be used to inform clinical decisions and standards of care. This full guideline document will therefore have an accompanying executive summary.

LIST OF ABBREVIATIONS

AAF	Amino Acid Formula
AD	Atopic Dermatitis
ALCAT	Antigen Leukocyte Antibody Test
CMA	Cow's Milk Allergy
eHF-CM	Extensively Hydrolysed Formula – Cow's Milk
FPIAP	Food Protein-Induced Allergic Proctocolitis
FPIES	Food Protein-Induced Enterocolitis Syndrome
HRF	Hydrolysed Rice Formula
IgE	Immunoglobulin E
MMR	Measles, Mumps and Rubella
MMRV	Measles, Mumps, Rubella and Varicella
OFC	Oral Food Challenge
OIT	Oral Immunotherapy
SF	Soy Formula
sIgE	Specific Immunoglobulin E
SPT	Skin Prick Test

EXECUTIVE SUMMARY OF RECOMMENDATIONS

Details of recommendations can be found in the main text and Evidence Matrices [EM] in the Supplementary Material

- **R** = Key Recommendation
- **GPP** = Good Practice Point

CHAPTER 1: DIAGNOSIS OF FOOD ALLERGY

R 1.1 We strongly recommend that in patients with suspected food allergy, a detailed allergy-focused clinical history should be taken as the first step of the diagnostic evaluation. [EM1-1]

R 1.2 We strongly recommend that in patients with a history suggestive of IgE-mediated food allergy, skin prick test (SPT) and/or measurement of food-specific IgE (sIgE) should be performed as first line tests to support diagnosis. [EM1-1]

R 1.3 We strongly recommend that patients with a history of suspected IgE-mediated food allergy be referred to an allergist where component-resolved diagnostic tests may be performed in selected patients in addition to SPT and/or sIgE to further support diagnosis or in preparation for an oral food challenge. [EM1-1]

R 1.4 We strongly recommend that a medically supervised oral food challenge (OFC) be considered to confirm or exclude food allergy in patients if diagnosis rem incorporating shared decision-making with patients. [EM1-1]

CHAPTER 2: NON-IgE MEDIATED FOOD ALLERGIES

GPP 2.1 We recommend that severe acute Food Protein-Induced Enterocolitis Syndrome (FPIES) be treated as a medical emergency, and the priority should be haemodynamic support with aggressive fluid resuscitation. [EM2-1]

GPP 2.2 For patients presenting with mild symptoms, a trial of oral rehydration may be attempted. [EM2-1]

R 2.3 We conditionally recommend ondansetron to be considered as an adjunctive therapy in patients ≥6 months of age with acute FPIES reactions. [EM2-2]

GPP 2.4 Intramuscular adrenaline is ineffective and should not be used to treat acute FPIES reactions. [EM2-3]

CHAPTER 3: MANAGEMENT OF FOOD ALLERGY

Cow's Milk Allergy (CMA)

R 3.1 We strongly recommend using extensively hydrolysed cow's milk formula (eHF-CM) or soy formula (SF)* as first choice, and an amino acid-based formula (AAF) as second choice in infants with cow's milk allergy who need a breastmilk alternative. [EM3-1]

*When initiating SF, clinicians should discuss with caregivers the low but possible risk of concomitant soy allergy, particularly in infants with no prior soy exposure.

R 3.2 We conditionally recommend that hydrolysed rice formula (HRF) can be considered as an alternative first choice formula (if available) in infants with cow's milk allergy. [EM3-1]

R 3.3 We strongly recommend against using partially hydrolysed cow's milk formula and mammalian milks (goat/sheep) in children with cow's milk allergy (both IgE and non-IgE-mediated) due to high risk of allergic reactions. [EM3-1]

GPP 3.4 In children (≥ 2 years old) and adults diagnosed with cow's milk allergy who need a milk substitute, fortified plant-based beverages (e.g. soy, coconut, rice, oat, quinoa, almond, cashew, pea) can be used. They should not be used as a substitute for formula milk in infants < 1 year old. [EM3-1]

R 3.5 We strongly recommend against routine maternal cow's milk dietary elimination for breastfed infants with IgE-mediated cow's milk allergy, unless the infant is symptomatic whilst being exclusively breastfed. If a trial of maternal cow's milk elimination is required, this should only occur for an initial period of 2 to 4 weeks, followed by reintroduction into the maternal diet to establish diagnosis. [EM3-2]

GPP 3.6 In breastfed infants with suspected Food Protein-Induced Allergic Proctocolitis (FPIAP) (non-IgE-mediated CMA), a trial of maternal cow's milk elimination should be considered. If a trial of maternal cow's milk elimination is required, this should only occur for an initial period of 2 to 4 weeks, followed by reintroduction into the maternal diet to establish diagnosis. [EM3-2]

GPP 3.7 In breastfed infants with suspected FPIES (non-IgE-mediated CMA), routine maternal cow's milk elimination in a breastfeeding mother is not recommended unless the infant is symptomatic while exclusively breastfed. [EM3-2]

GPP 3.8 If maternal cow's milk dietary elimination is required, vitamin D and calcium supplementation should be advised and referral to a dietitian for nutritional counselling can be considered for the mother. [EM3-2]

R 3.9 We strongly recommend that patients with cow's milk allergies should be assessed for tolerance to baked milk products. If tolerated, regular consumption of baked milk products should be recommended. [EM3-3]

Egg Allergy

R 3.10 We strongly recommend that Measles, Mumps and Rubella (MMR) or Measles, Mumps, Rubella and Varicella (MMRV) or influenza vaccine be given in primary care to patients with egg allergy of any severity, with routine precautions. [EM3-4]

R 3.11 We strongly recommend against split dosing, prior allergy testing to vaccines or eggs, prior allergy specialist review or an extended observation post-administration of MMR, MMRV or influenza vaccines in patients with egg allergy. [EM3-4]

R 3.12 We strongly recommend that patients with egg allergy who require Yellow Fever vaccination should be referred to an allergy specialist for assessment and supervised administration. [EM3-4]

R 3.13 We strongly recommend that patients with egg allergies should be assessed for tolerance to baked egg products. If tolerated, regular consumption of baked egg products should be recommended. [EM3-5]

GPP 3.14 Lysozyme (muramidase)-containing expectorants and mucolytics should not be used in patients with egg allergy as they are derived from eggs. [EM3-6]

Peanut Allergy

R 3.15 We conditionally recommend referring peanut-allergic patients to an allergist to for evaluation of potential tree nut co-allergy and to facilitate introduction of untried tree nuts. Blanket avoidance of tree nuts in patients with peanut allergies is not recommended. [EM3-7]

Tree Nut Allergy

R 3.16 We conditionally recommend allergist referral for tree nut-allergic patients to screen for additional tree nut allergies, to facilitate the introduction of untried tree nuts. Blanket avoidance of all tree nuts in patients with a specific tree nut allergy is not recommended. [EM3-8]

Wheat Allergy

GPP 3.17 Patients with wheat allergies may consume rice, millet, corn and quinoa as alternative grains. [EM3-9]

GPP 3.18 We suggest that patients with wheat allergies consult an allergist with regards to consumption of rye, barley and oat, if not already introduced and tolerated, due to risk of cross-reactivity. [EM3-9]

Fish Allergy

GPP 3.19 We recommend that patients with a fish allergy may continue to eat the types of fish that they can tolerate. An allergist may be consulted before introducing new types of fish. [EM3-10]

Shellfish Allergy

GPP 3.20 We recommend that patients with shellfish allergy may continue to eat the types of shellfish that they can tolerate. An allergist may be consulted before introducing new types of shellfish. [EM3-11]

CHAPTER 4: MANAGEMENT OF ACUTE FOOD-INDUCED ALLERGIC REACTIONS

R 4.1 We strongly recommend using non-sedating H1 antihistamines to treat patients experiencing mild allergic reactions, such as urticaria, angioedema, or oral itch. [EM4-1]

GPP 4.2 Medications are not routinely recommended to prevent allergic reactions from occurring in individuals with established IgE-mediated food allergies. [EM4-2]

R 4.3 We strongly recommend that patients suspected of having food-related anaphylaxis be treated as an emergency with the immediate administration of intramuscular adrenaline as the first-line intervention. [EM4-3]

R 4.4 We strongly recommend administering additional doses of intramuscular adrenaline every 5 to 15 minutes based on the patient's clinical response, for those who do not show improvement while awaiting transfer to an emergency facility. [EM4-3]

GPP 4.5 We recommend that the following treatments be administered as adjunctive measures to intramuscular adrenaline if clinically indicated:

- High-flow supplemental oxygen for hypoxia/respiratory distress
- Intravenous fluids for hypotension/shock
- Inhaled beta-2-agonists for bronchoconstriction
- Non-sedating antihistamines for cutaneous symptoms. [EM4-3]

R 4.6 We conditionally recommend against the routine use of glucocorticoids for the prevention of biphasic anaphylaxis. [EM4-3]

R 4.7 We strongly recommend the prescription of adrenaline autoinjectors for individuals with a history of food-induced anaphylaxis. [EM4-4]

GPP 4.8 We suggest that adrenaline autoinjectors may be considered for individuals with a history of mild-to-moderate allergic reactions to foods, particularly if there are additional risk factors for anaphylaxis. Risk factors include, but are not limited to:

- Unstable or moderate-to-severe persistent asthma
- Previous reaction to trace amounts of food allergens
- Allergies to peanuts or tree nuts
- History of risk-taking behaviour
- Limited/ remote access to medical care
- Underlying systemic mastocytosis
- Oral immunotherapy for food allergy
- Inability to avoid further exposure to the allergen consistently. [EM4-4]

CHAPTER 5: NUTRITIONAL COUNSELLING AND EVALUATION

GPP 5.1 We recommend regular growth monitoring and nutritional counselling for all children with food allergies. [EM5-1]

GPP 5.2 Referral to a dietitian should be made for children with food allergies who present with poor growth or suspected malnutrition, including obesity. Other considerations for a comprehensive nutrition consultation with the dietitian include patients with:

- Cow's milk allergy
- Multiple (>2) concurrent food allergies, especially those excluding major staples such as cow's milk, egg, and wheat
- Elimination diet without appropriate nutritional substitutes
- Delayed weaning progression in infants and/or difficulties transiting to more textured foods, high child and/or parental anxiety around feeding
- History of multiple accidental exposures or anaphylaxis indicating an inability to manage food avoidance
- Additional dietary restrictions such as vegetarianism or personal food beliefs. [EM5-1]

GPP 5.3 Targeted nutritional biomarkers for micronutrient assessment should be considered after evaluating dietary intake, food eliminated, growth patterns and physical signs. [EM5-1]

GPP 5.4 Vitamin and mineral supplementation in children with food allergies should be guided by both the evaluation of nutritional biomarkers and the assessment of dietary intake. [EM5-1]

CHAPTER 6: MANAGEMENT OF FOOD ALLERGIES IN SCHOOLS, PRE-SCHOOLS AND CHILDCARE FACILITIES

GPP 6.1 Schools and childcare centres should have at least one, or more if possible, member of staff trained in the prevention, recognition and management of allergic reactions [EM6-1]

GPP 6.2 Parents of students with a diagnosed food allergy should provide the school or childcare centre with an up-to-date allergy action plan (Appendix 1). [EM6-1]

CHAPTER 7: NATURAL HISTORY OF FOOD ALLERGY

GPP 7.1 We recommend that all patients with food allergies should be reviewed regularly by an allergist to reassess allergy status. Children younger than 5 years old should have at least yearly monitoring of food allergies. [EM7-1]

GPP 7.2 We recommend that SPT and food-specific or component resolved IgE should be performed regularly, as a declining trend of sIgE level, and size of SPT wheal is a good prognostic marker for development of tolerance. [EM7-1]

GPP 7.3 We recommend that patients with a trend of declining sIgE and/or SPT wheal size and no recent clinical reactions, should be re-evaluated for possible natural resolution, by an allergist, to enable reintroduction of tolerated food. [EM7-1]

GPP 7.4 The use of egg and milk ladders for reintroduction of egg and milk, in patients with mild egg and milk allergies, can be considered. This should be done under guidance of an allergist as appropriate patient selection and preparation is essential to minimise the risk of anaphylaxis. [EM7-1]

CHAPTER 8: ORAL IMMUNOTHERAPY FOR FOOD ALLERGY

R 8.1 We strongly recommend offering oral immunotherapy (OIT) under specialist supervision to children with persistent IgE-mediated peanut allergy to achieve desensitisation (increase the amount of peanut tolerated while on therapy), in centres with expertise and infrastructure in OIT. Informed shared decision making is key in patient's choice to take up OIT. [EM8-1, 8-2, 8-3]

R 8.2 We conditionally recommend offering OIT under specialist supervision to children with persistent IgE-mediated hen's egg, cow's milk, tree nut and wheat allergy to achieve desensitisation (increase the amount of allergen tolerated while on therapy), in centres with expertise and infrastructure in OIT. [EM8-1, 8-2, 8-3]

R 8.3 We conditionally recommend OIT be offered as a treatment option for adults. [EM8-1, 8-2, 8-3]

GPP 8.4 OIT should be discussed with, and provided by, a specialist in allergy who is experienced in providing OIT to patients. [EM8-1]

GPP 8.5 Uncontrolled asthma is an absolute contraindication to OIT. Asthma must be controlled before beginning OIT and proactively managed during OIT. [EM8-1]

GPP 8.6 Given the potentially higher risk of anaphylaxis during OIT, carrying an adrenaline autoinjector is good practice. [EM8-1]

CHAPTER 9: ATOPIC DERMATITIS IN FOOD ALLERGY

R 9.1 We strongly recommend against the routine use of food allergy tests to screen for food allergy in atopic dermatitis (AD) patients in view of the high rates of food sensitisation (i.e. false positive). [EM9.1]

R 9.2 We strongly recommend food allergy evaluation by an allergy specialist in young patients (less than 2 years old) with severe and refractory AD despite optimisation of, and adherence to, conventional therapy and where there are concerns of food reactions. [EM9-2]

GPP 9.3 We recommend referral to an allergy specialist for young infants with severe AD, whose timely introduction of solids and allergenic foods may be delayed due to parental concerns. [EM9-3]

R 9.4 We strongly recommend against long-term untargeted elimination of foods in AD patients, as it is detrimental to a patient's health and quality of life. [EM9-3, 9-4]

GPP 9.5 We recommend against the use of patch tests to diagnose food allergy in AD patients. [EM9-2]

CHAPTER 10: UNPROVEN AND DISPROVED TESTS AND TREATMENTS

GPP 10.1 Unproven/disproved tests should not be used in the diagnosis of food allergy. The tests include:

- ALCAT - Antigen leucocyte antibody test
- Food specific IgG antibodies
- Intradermal skin tests
- Atopy patch test
- Neutralisation provocation tests
- Applied kinesiology
- Bioresonance
- Hair analysis [EM10-1]

GPP 10.2 Unproven/disproved modalities should not be used in the treatment of food allergy. These modalities include:

- Neutralisation provocation tests
- Bioresonance
- Rotational diet [EM10-1]

APPENDIX 1: ALLERGY ACTION PLAN

ALLERGY ACTION PLAN

PAEDIATRIC

Medications specified on this plan should be administered according to the plan.

This document should be completed by the child's treating healthcare professional. It must not be altered without their permission.

Name: _____ **DOB:** ___/___/___

PHOTO

Allergies: _____

Emergency contact details:

Plan prepared by:

I hereby authorise school staff to administer the medications listed on this plan.

Signed: _____

Parent name: _____

MILD ALLERGIC REACTIONS

- Itching and swelling of lips, face and/or eyes
- Hives or wheals (itchy skin rash)
- Tingling mouth
- Abdominal pain/vomiting/diarrhoea
- Sudden change in behaviour

ACTION

- Stay with the child and call for help
- Take antihistamines: _____ (if vomited, may repeat dose)
- Locate EpiPen (adrenaline auto-injector)
- Contact family/caregiver through emergency contact
- Any other medications: _____

ANAPHYLAXIS (SEVERE/LIFE THREATENING ALLERGIC REACTIONS)

- AIRWAY: Persistent cough, hoarse voice, difficulty swallowing, swollen tongue, throat tightness
- BREATHING: Difficult or noisy breathing, wheeze
- CONSCIOUSNESS: Persistent dizziness, looking pale or floppy, suddenly sleepy, collapse, loss of consciousness
- OTHERS: Severe abdominal pain/persistent vomiting

Only a few symptoms may be present and severity may change quickly.

Anaphylaxis can occur without milder symptoms such as skin symptoms or swelling.

ACTION

- If ANY of the above are present, give EpiPen (adrenaline auto-injector) without delay
- If in doubt, give EpiPen
- Lay flat, elevate legs. If breathing is difficult, child may be allowed to sit but not stand

- Give EpiPen/EpiPen Junior without delay
- Call 995 and say ANAPHYLAXIS ('ANA-FIL-AX-IS')

After giving EpiPen:

- Stay with the child and ensure that they DO NOT stand up
- Contact family/caregiver through emergency contact
- Commence CPR if child is unresponsive and not breathing
- If there is no response after 5 min, give a second EpiPen if available
- Medical observation in hospital is recommended after anaphylaxis

HOW TO GIVE EPIPEN

Form fist around EpiPen and pull off BLUE safety cap.

Hold thigh firmly and keep the leg still to avoid injuries. Place the ORANGE tip against mid outer thigh (with or without clothing).

Push down hard until a 'click' is heard or felt. Hold EpiPen firmly in place for 3 seconds. Remove EpiPen.

Massage injection area for 10 seconds.

ALLERGY ACTION PLAN

ADULT

ASTHMA & ALLERGY ASSOCIATION

Medications specified on this plan should be administered according to the plan.

This document should be completed by the patient's treating healthcare professional. It must not be altered without their permission.

Name: _____ **DOB:** ____/____/____

Allergies: _____

_____

_____

Emergency contact details:

_____

_____

_____

MILD ALLERGIC REACTIONS

- Itching and swelling of lips, face and/or eyes
- Hives or wheals (itchy skin rash)
- Tingling mouth
- Abdominal pain/vomiting/diarrhoea

Plan prepared by:

ACTION

- Stay with the patient and call for help
- Take antihistamines: _____ (if vomited, may repeat dose)
- Locate EpiPen (adrenaline auto-injector)
- Contact family/caregiver through emergency contact
- Any other medications: _____

ANAPHYLAXIS (SEVERE/LIFE THREATENING ALLERGIC REACTIONS)

- AIRWAY: Persistent cough, hoarse voice, difficulty swallowing, swollen tongue, throat tightness
  BREATHING: Difficult or noisy breathing, wheeze
- CONSCIOUSNESS: Persistent dizziness, suddenly sleepy, collapse, loss of consciousness
- OTHERS: Severe abdominal pain/persistent vomiting

Only a few symptoms may be present and severity may change quickly.

Anaphylaxis can occur without milder symptoms such as skin symptoms or swelling.

ACTION

- If ANY of the above are present, give EpiPen (adrenaline auto-injector) without delay
- If in doubt, give EpiPen
- Lay flat, elevate legs. If breathing is difficult, patient may be allowed to sit but not stand

- Give EpiPen without delay
- Call 995 and say ANAPHYLAXIS ('ANA-FIL-AX-IS')

After giving EpiPen:

- Stay with the patient and ensure that they DO NOT stand up
- Contact family/caregiver through emergency contact
- Commence CPR if patient is unresponsive and not breathing
- If there is no response after 5 min, give a second EpiPen if available
- Medical observation in hospital is recommended after anaphylaxis

HOW TO GIVE EPIPEN

Form fist around EpiPen and pull off BLUE safety cap.

Hold thigh firmly and keep the leg still to avoid injuries. Place the ORANGE tip against mid outer thigh (with or without clothing).

Push down hard until a 'click' is heard or felt. Hold EpiPen firmly in place for 3 seconds. Remove EpiPen.

Massage injection area for 10 seconds.

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COLLEGE OF PAEDIATRICS AND CHILD HEALTH, SINGAPORE
Academy of Medicine, Singapore
81 Kim Keat Road
#11-00 NKF Centre
Singapore 328836