

## Anaphylaxis: the facts

### The aim of this fact sheet

Anaphylaxis (pronounced ana-fil-ax-is) is a severe and often sudden allergic reaction. It can occur when someone with allergies is exposed to something, they are allergic to (known as an allergen). Reactions usually begin within minutes and rapidly progress but can occur up to 2-3 hours later.

**Anaphylaxis is potentially life-threatening, and always requires an immediate emergency response.**

If you or your child have had anaphylaxis, this factsheet will help you understand more about the condition: what anaphylaxis is, what causes it, the treatments and other vital facts. If you have experienced a sudden allergic reaction in the past, then you may be at risk of anaphylaxis even if you have not had anaphylaxis before. We advise that you see your GP and ask for a referral to an allergy clinic.

A diagnosis of anaphylaxis can be daunting at first, but by becoming well-informed, thinking ahead and employing daily coping strategies, people affected find that life can return, almost, to normal.

Throughout the text you will see brief medical references given in brackets. Full references to these documents are listed at the end of the Factsheet.

### What are the causes of anaphylaxis?

The common causes of anaphylaxis include foods such as peanuts, tree nuts, milk, eggs, shellfish, fish, sesame seeds and kiwi fruit, although many other foods have also been known to trigger anaphylaxis. Some people can react to tiny amounts of food, although this rarely causes a very severe reaction. Non-food causes include wasp or bee stings, natural latex (rubber), and certain drugs such as penicillin. In some people exercise can trigger a severe reaction – either on its own or in combination with other factors such as food or drugs (for example, aspirin).

Sometimes the cause of the reaction is not found. Such reactions may be labelled “idiopathic anaphylaxis” (cause unknown). This does not mean the condition is psychological, though emotional stress can sometimes worsen a reaction.

## What are the symptoms of anaphylaxis?

Most healthcare professionals consider an allergic reaction to be anaphylaxis when it involves a difficulty in breathing or affects the heart rhythm or blood pressure. Any one or more of the following symptoms may be present. These are often referred to as the ABC symptoms:

| <b>A</b> irway   | <b>B</b> reathing  | <b>C</b> onsciousness/Circulation   |
|--|--|---|
| <ul style="list-style-type: none"> <li>• Persistent cough</li> <li>• Vocal changes (hoarse voice)</li> <li>• Difficulty in swallowing</li> <li>• Swollen tongue</li> </ul> | <ul style="list-style-type: none"> <li>• Difficult or noisy breathing</li> <li>• Wheezing (like an asthma attack)</li> </ul> | <ul style="list-style-type: none"> <li>• Feeling lightheaded or faint.</li> <li>• Clammy skin</li> <li>• Confusion</li> <li>• Unresponsive/unconscious (due to a drop-in blood pressure)</li> </ul> |

If there is a dramatic fall in blood pressure (anaphylactic shock) the person may become weak and floppy and may have a sense of something terrible happening. This may lead to collapse, unconsciousness and – on rare occasions – death.

In addition to the ABC symptoms listed above, the following, less severe symptoms may occur:

- Widespread flushing of the skin
- Nettle rash (otherwise known as hives or urticaria)
- Swelling of the skin (known as angioedema) anywhere on the body (for example, lips, face).
- Abdominal pain, nausea and vomiting

Those symptoms can also occur on their own. In the absence of the more serious ABC symptoms listed above, the allergic reaction is likely to be less severe, but you should watch carefully in case ABC symptoms develop.

## Why does anaphylaxis occur?

An allergic reaction (including anaphylaxis) occurs because the body's immune system reacts inappropriately in response to the presence of a food or substance that it wrongly perceives to be a threat. When this happens, chemicals such as histamine are released from cells in the blood and tissues. These can cause swelling in the skin, lips, mouth, throat or lower airway causing difficulty in swallowing and/or breathing.

## What should I do if I'm worried that my allergy may be severe?

See your GP as soon as possible. Many GPs are well informed about allergy and can make a thorough diagnosis. In most cases, the GP will need to refer you to an NHS allergy clinic.

If the allergy affects your child your GP should be guided by the clinical guideline issued by NICE (the National Institute for Health and Care Excellence) on the subject of “Food allergy in children and young people” (CG116). This makes it clear which cases should be referred. The guidance can be accessed here: <http://guidance.nice.org.uk/CG116>

Your GP can find information about the nearest children’s allergy clinic from the website of the BSACI (British Society for Allergy and Clinical Immunology): [www.bsaci.org](http://www.bsaci.org).

If you are unsure about the potential severity of your allergy, don’t let that deter you from seeking your doctor’s advice. It’s better to be safe than sorry.

### What will an allergy clinic do?

The clinic will take a detailed history of previous reactions and other allergic conditions you or your child may have, such as asthma, eczema or hay fever. Valuable information can also be provided through allergy tests, such as skin prick tests and blood tests. Together, this can help the doctor or specialist nurse predict the likelihood that a specific food or substance will cause an allergic reaction. They do **not** predict how severe such a reaction might be, but the history can help the doctor decide whether to prescribe “rescue” medicines such as adrenaline auto-injector “pen”.

Occasionally a “food challenge” may be offered to confirm diagnosis of allergy to a specific food or to rule out food allergy. The person will be asked to eat small amounts of the suspect allergen, gradually increasing the amount until it is clear that he or she is not allergic, or else a reaction occurs. Such tests should **only** be done in an allergy clinic under controlled conditions.

Similarly, a challenge, under carefully supervised conditions, may be needed if you are suspected to be allergic to a prescribed drug. This is because currently available tests may often not provide a reliable diagnosis.

In our opinion, any allergy diagnosis using questionable techniques such as those advertised on the Internet should be viewed with caution (see Royal College of Pathologists’ report, 2002, and NICE guideline CG 116 on the diagnosis and assessment of food allergy in children and young people). The NICE guideline specifically warns against Vega testing, applied kinesiology and hair analysis in the diagnosis of food allergy.

### What is the treatment for a severe reaction?

Pre-loaded auto-injectors containing adrenaline are prescribed for people believed to be at risk of anaphylaxis. Adrenaline is referred to in some countries as epinephrine, which is the internationally recognised term for adrenaline.

Because severe allergic reactions can occur rapidly, the prescribed auto-injector must be readily available at all times. The injection should be given as soon as any symptoms of anaphylaxis are present. **If in doubt, give**

**adrenaline.** A second dose should be given after 5-10 minutes if symptoms of anaphylaxis remain, or if there is any doubt about whether the symptoms have improved.

An ambulance must be called immediately following an injection of adrenaline, even if there is immediate improvement. The emergency service operator must be told the person is suffering from anaphylaxis and needs to be attended by paramedics.

If the person's condition deteriorates after making the initial 999 call, a second call to the emergency services should be made to ensure an ambulance has been dispatched.

The matter of how many auto-injectors you should carry is addressed later in this fact sheet ("How many auto-injectors should I carry?").

### How does adrenaline work?

Adrenaline acts quickly to open up the airways, stop swelling and raise the blood pressure. To allow it to work most effectively, it should be administered as soon as anaphylaxis is suspected.

It is difficult to prove categorically that adrenaline saves lives and studying severe reactions in research is difficult because of the speed with which anaphylaxis can occur. This uncertainty was acknowledged in a major review of the medical literature on the use of adrenaline for anaphylaxis (Sheikh et al, Cochrane Collaboration, 2011). Nevertheless, we are aware of a large amount of anecdotal evidence showing that most people dying from anaphylaxis did not receive prompt treatment with adrenaline and further evidence showing that people have recovered quickly when adrenaline was given. In our opinion, this provides strong evidence for the effectiveness of adrenaline.

### What auto-injectors are available?

Pre-loaded adrenaline auto-injectors – Emerade®, EpiPen® or Jext® – are available on prescription for those thought to be at risk of a severe reaction.

You can visit their individual websites for information:

[www.emerade-bausch.co.uk](http://www.emerade-bausch.co.uk)

[www.epipen.co.uk](http://www.epipen.co.uk)

[www.jext.co.uk](http://www.jext.co.uk)

If you carry adrenaline you should check the expiry dates of your auto-injector at regular intervals. The three injector companies listed above all send out expiry date reminders to anyone who registers for this.

In the case of children, you should check whether a growth spurt means the child should move up from a “Junior” device (0.15mg) to a standard strength one (0.3mg). This is necessary once the child reaches 25kg.

### How many auto-injectors should I carry?

In 2014, the UK’s Medicines and Healthcare Products Regulatory Agency (MHRA) advised that anyone who is at risk of suffering anaphylaxis should always have at least two adrenaline auto-injector devices immediately available. The MHRA report said: “It is acknowledged that in some cases, a single injection is not sufficient to achieve a response for a number of reasons, including severity of attack as well as the possibility that a dose has not been effectively administered; a second injection may therefore be needed.” The Anaphylaxis Campaign supports this view.

In cases where the risk of anaphylaxis is thought to be low, there is a difference of opinion among members of the medical community. While some allergy specialists agree that two auto-injectors must **always** be immediately available (in line with the MHRA report), others believe it is sufficient to have one device available, arguing that one injection is likely to be enough to treat the symptoms until emergency medical help arrives.

This is a matter that you should discuss with your allergy specialist. To read the MHRA’s 2014 review, see the references near the bottom of this page.

### What increases the risk of a severe reaction?

Although it does not necessarily follow that each reaction is worse than the one before, there are times when you may be particularly vulnerable and at increased risk of a severe reaction. Times when you need to be particularly careful to avoid the trigger allergen include:

- If you have asthma that is poorly controlled
- If you are suffering from an infection, or have recently had one
- If you exercise just before or just after contact with the allergen
- If you are also suffering from aeroallergen symptoms, such as hay fever (see Vetander et al 2012)
- During times of emotional stress
- If you have been drinking alcohol

If you are allergic to a food, the amount eaten is also important as the more you consume, the worse the reaction is likely to be.

The way the allergen is presented in the food is also important. For example, peanut allergens already dissolved in Satay sauce, curry sauce or mayonnaise (or plant allergens in smoothies) can cause much worse throat swelling than when the whole food needs to be chewed first to extract the allergen.

Make sure you remain vigilant on special occasions including holidays or times of celebration, such as weddings, buffets, parties or religious festivals.

### What can I do to protect myself?

1. **If you have asthma** as well as allergies, make sure your asthma is well managed. If you have poorly controlled asthma, there is a higher likelihood of any allergic reaction becoming severe, (Pumphrey and Gowland, 2007, and Noimark et al, 2012). You can take control of your asthma by knowing what medicines to take, how much to take and when to take them. See your GP or asthma nurse for advice on this crucial point and to obtain an asthma management plan to help you self-manage.
2. **If you have been prescribed adrenaline**, carry it at all times – no exceptions.
3. **Think ahead.** Write out an emergency allergy action plan in advance. Make sure those around you know how and when to administer the adrenaline. Practise regularly with a trainer device. The BSACI has [Allergy Action Plans](#) for children available to download from its website. Information for anaphylaxis in school children can be found at [www.sparepensinschools.uk](http://www.sparepensinschools.uk).

### What should I do if I think I am having a severe reaction?

Use your adrenaline device without delay if you believe the reaction could be anaphylaxis. If you can't breathe or can't stand you should sit or lie on the floor – whichever is the most comfortable position for you at the time – and administer adrenaline as you should have been shown. Then dial 999 immediately or get someone else to do it. If feeling very faint it may help to raise your legs against a wall. If vomiting you should lie on your side.

Your allergist should help you understand in advance what symptoms provide a signal that a severe reaction is occurring. Some people worry that adrenaline may be harmful, but evidence supports the safety of prescribed adrenaline devices so long as they are used correctly (Sheikh et al, Cochrane Collaboration, 2011).

**Always** consider anaphylaxis as a possibility in someone with known food allergy who has sudden breathing difficulty.

[Click here](#) to read our separate fact sheet on adrenaline.

### Biphasic anaphylaxis

If you have anaphylaxis, you will need to be observed in hospital after you have recovered. This is because in around 1 in 20 cases, a second 'wave' of symptoms can develop. This is referred to as a biphasic reaction. Around half of biphasic reactions occur within 6-12 hours of the initial reaction (Lee et al, 2015). The length of the observation period should be determined by the treating doctor.

## Does the risk of anaphylaxis get less over time?

There is no evidence that the risk of anaphylaxis gets less over time; however, some people will outgrow their allergies over time. This is more common in young children, particularly those allergic to cow's milk, egg and wheat.

## What is Mastocytosis?

In most cases of anaphylaxis there is a trigger such as a food, drug, insect sting or some other agent, but anaphylaxis can also occur in people who have a very rare condition called Mastocytosis, which is caused by too many 'mast cells' gathering in the tissues of the body. These are the main cells that release histamine and other chemicals involved in allergic reactions, causing symptoms such as a skin rash, itchy skin and anaphylaxis. If you have this very rare condition, it's important that your doctor identifies Mastocytosis as the cause of your symptoms. Further information:

<http://www.nhs.uk/conditions/Mastocytosis/Pages/Introduction.aspx>

## Anaphylaxis: the key messages

Anaphylaxis is serious but, in our view, it is manageable. With a calm but committed attitude you will certainly cope. **Remember these important points:**

- If you are at risk, see your GP and ask for a referral to an allergy clinic. Guidelines have been issued by NICE showing what should be expected from your doctor. See [www.nice.org.uk/guidance/cg134](http://www.nice.org.uk/guidance/cg134).
- If you are prescribed an adrenaline injector, learn how to use it and carry it everywhere at all times.
- Do your research. If the allergen that affects you is a food, read food labels scrupulously and ask direct questions wherever food is served.

## References

Lee, S., Bellolio, M.F., Hess, E.P., Erwin, P., Murad, M.H., Campbell, R.L. (2015) Time of Onset and Predictors of Biphasic Anaphylactic Reactions: A Systematic Review and Meta-analysis. *J Allergy Clin Immunol Pract.* 3 (3). p. 408-416

Medicines & Healthcare Products Regulatory Agency (2014) 'Adrenaline auto-injectors: a review of clinical and quality considerations' Available from <http://www.mhra.gov.uk/home/groups/comms-ic/documents/websitesources/con423091.pdf>

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Sheikh, A., Shehata, Y.A., Brown, S.G.A., Simons, F.E.R. (2011) Adrenaline (epinephrine) for the treatment of anaphylaxis with and without shock (review). *The Cochrane Collaboration*

Vetander, M., Helander, D., Flodstrom, C., Ostblom, E., Alfven, T., Ly, D.H., Hedlin, G., Lilja, G., Nilsson, C., Wickman, M. (2012) Anaphylaxis and reactions to foods in children: a population-based case study of emergency department visits. *Clinical and Experimental Allergy*. 42 (4):p.568-577.

### NICE guidelines

NICE (2011). Diagnosis and assessment of food allergy in children and young people in primary care and community settings (CG116). <http://guidance.nice.org.uk/CG116>

NICE (2014). Anaphylaxis: assessment to confirm an anaphylactic episode and the decision to refer after emergency treatment for a suspected anaphylactic episode (CG134). [www.nice.org.uk/guidance/cg134](http://www.nice.org.uk/guidance/cg134)

### Reviewers

This fact sheet has been peer reviewed by Dr Paul Turner, Clinical Senior Lecturer in the Section of Paediatrics (Department of Medicine), Imperial College, London; and Dr Paul Williams, Consultant Clinical Immunologist, Department of Immunology, University Hospital of Wales. We are not aware of any relevant disclosures that would need to be made in respect of their reviews of this fact sheet.

**Disclaimer** – The information provided in this Factsheet is given in good faith. Every effort has been taken to ensure accuracy. All patients are different, and specific cases need specific advice. There is no substitute for good medical advice provided by a medical professional.

### About the Anaphylaxis Campaign: Supporting people at risk of severe allergies

The Anaphylaxis Campaign is the only UK wide charity to exclusively meet the needs of the growing numbers of people at risk from severe allergic reactions (anaphylaxis) by providing information and support relating to foods and other triggers such as latex, drugs and insect stings. Our focus is on medical facts, food labelling, risk reduction and allergen management. The Campaign offers tailored services for individual, clinical professional and corporate members.

Visit our website [www.anaphylaxis.org.uk](http://www.anaphylaxis.org.uk) and follow us on Twitter [@Anaphylaxiscoms](https://twitter.com/Anaphylaxiscoms).