

Allergic and Toxic Reactions to Seafood

Frequently Asked Questions

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Q 1: Is seafood allergy common?

Seafood allergy occurs most commonly where seafood is an important part of the diet, such as in Asia and Scandinavia. Approximately 1% of the population is estimated to have a seafood allergy. It is more common in teenage and adult life than very early childhood. About 20% of people will grow out of their seafood allergy with time.

Q 2: What types of seafood cause allergic reactions?

The major groups of seafood that can trigger allergic reactions:

Fish (vertebrates - with a backbone)

- Including salmon, cod, mackerel, sardines, herring, anchovies, tuna, trout, haddock, eels and rays.

Shellfish (invertebrates – without a backbone)

- Crustaceans including prawns/shrimps, lobster, crab, crayfish, and yabbies.
- Molluscs including oysters, mussels, clams, octopus, squid (calamari), abalone, and sea slugs.

The protein allergens present in one seafood group can be very different to those in other seafood groups. This means that a person can be allergic to fish only, shellfish only, or members of both groups. People who are allergic to one fish are usually (but not always) allergic to most other fish.

Q 3: What is cross reactivity?

Cross reactivity means that a similar protein is present in a range of different foods. If the same protein is present in several foods, then that person may have allergic reactions to any food containing that protein. Examples of cross reactivity include people allergic to similar proteins present in one fish that are also present in other fish, or those allergic to proteins present in prawn, crab and lobster.

Allergy to one crustacean usually means that all must be avoided. People with allergy to seafood from one group (such as crustaceans) may tolerate seafood from another group (such as molluscs). This can only be confirmed with allergy testing and guidance from a clinical immunology/allergy specialist.

Q 4: How are people exposed to the seafood allergen?

Eating seafood is the major trigger for allergic reactions.

Sensitive people may sometimes have breathing difficulties from inhaling fumes when seafood is being cooked, and in seafood processing factories. They may also have symptoms from touching seafood, such as when cleaning and handling fish.

Symptoms caused by allergic reactions to seafood usually appear within minutes. Delayed reactions and exercise-induced anaphylaxis can occur, particularly after eating shellfish such as oyster, abalone, squid, and shrimp.

Q 5: What are the signs and symptoms of allergic reactions to seafood?

Signs and symptoms of **mild to moderate allergic reactions** to foods include:

- Swelling of the lips, face, eyes
- Hives or welts on the skin
- Abdominal pain, vomiting

Signs of **anaphylaxis** to foods include any one of the following:

- Difficult or noisy breathing
- Swelling of the tongue
- Swelling or tightness in the throat
- Wheeze or persistent cough
- Difficulty talking or hoarse voice
- Persistent dizziness or collapse
- Pale and floppy (in young children)

Anaphylaxis is the most severe type of allergic reaction and should always be treated as a medical emergency. Anaphylaxis requires immediate treatment with adrenaline (epinephrine), which is injected into the outer mid-thigh muscle. Delayed treatment can result in fatal anaphylaxis.

Q 6: How is a food allergy diagnosed?

Accurate diagnosis of food allergy is important. A doctor (GP) will ask questions that may help to narrow down the list of likely causes of allergy such as foods or medicines consumed that day, or exposure to stinging insects. This approach will also help to exclude conditions that can sometimes be confused with food allergy. A referral to a clinical immunology/allergy specialist may be given.

Skin or blood allergen specific IgE allergy tests help confirm or exclude potential triggers. While the results of allergy testing by a specialist are a guide to whether the person is allergic, results will not be able to tell you whether your reaction will be mild or severe.

It may not be possible to test for all seafood species using commercial skin prick or blood allergy testing, since these are not available for all seafood species. For this reason, some allergy clinics will recommend that you bring samples of fresh food for testing.

Q 7: Are there ‘allergy testing’ methods which are unproven and not recommended?

Some unorthodox/alternative practitioners offer unproven, non-evidence-based allergy ‘tests’ and ‘treatments’ that are not recommended by ASCIA.

These include cytotoxic food testing, kinesiology, hair analysis, vega testing, electrodermal testing, pulse testing, reflexology, bioresonance, Bryan’s or Alcat tests, VoiceBio, allergy elimination techniques and immunoglobulin G (IgG) to foods. These tests can result in misdiagnosis, ineffective treatments, costly and often dangerous dietary restrictions.

Q 8: How is seafood allergy managed?

People can learn to manage their seafood allergy with the guidance of their clinical immunology/allergy specialist. It is important for people with confirmed food allergy to:

- Avoid confirmed food allergens.
- Know the signs and symptoms of allergic reactions and know what to do when a reaction occurs.
- Carry their adrenaline injector (if prescribed) and ASCIA Action Plan at all times.

Q 9: How can seafood be avoided?

Avoidance of one or more groups of seafood is often advised to manage confirmed seafood allergy. Accidental exposure is more likely to happen when eating away from home.

Other potential sources of accidental exposure and cross-contamination include:

- Seafood platters and buffets.
- Asian foods often contain shellfish as a common ingredient or contaminant such as prawns in fried rice or soups, and seafood extender.
- Takeaway food which may be rolled in the same batter or cooked in the same oil as seafood.
- Commercial pizzas where contamination may happen during preparation.
- Anchovies in Caesar salads, and as an ingredient in Worcestershire sauce.
- Contaminated barbeques where seafood has been cooked.

Isinglass is sometimes used as a fining agent to remove cloudiness from beer and wine. Made from the swim bladder of certain types of fish, it consists almost entirely of collagen, and is considered unlikely to cause allergic reactions. Use of isinglass in beer and wine has been exempted from mandatory labelling regulations in Australia.

While the risk of allergic reactions to fish oils is low in those allergic to fish due to the method of purification, people with fish allergy are advised to seek medical advice before consuming. Other sources of omega-3 fatty acids include evening primrose oil and flaxseed oil.

Q 10: Does cooking seafood affect tolerance?

Seafood allergens are usually heat stable and cannot easily be destroyed through cooking. Some people can tolerate tinned fish (intensely heat treated) yet are unable to tolerate the same fish when freshly cooked.

Q 11: Are seafood allergy and iodine allergy related?

People with seafood allergy react to proteins in the seafood, not to iodine in the fish or shellfish. People who are allergic to seafood are not at an increased risk of allergic reactions to iodine in topical antiseptics such as Betadine or Povidine, or intravenous x-ray radio-contrast agents. People with iodine allergy are not at increased risk of seafood allergy.

Q 12: Is allergy to glucosamine common?

Allergic reactions to glucosamine are not common. Glucosamine is a popular complementary medicine used to treat osteoarthritis. It is derived from the outer coatings of shellfish such as crustaceans. Sometimes chondroitin sulfate is added, usually derived from shark cartilage.

Products containing glucosamine registered in Australia and New Zealand carry labels warning against their use in people allergic to shellfish/crustaceans. Vegetarian glucosamine is available which does not contain seafood allergen as it is produced in bacteria cultures.

Q 13: What toxic reactions look like seafood allergy?

Some conditions caused by toxins or parasites in seafood can resemble allergic reactions to seafood.

Scombroid Fish Poisoning

An allergy-like reaction that occurs after eating fish that has high levels of histamine because it has not been properly stored or processed. This is more common in fish which turns brown upon cooking. This including mackerel, tuna, king fish, herring, sardines, marlin, anchovies and bluefish. Affected fish often have a metallic or peppery taste.

Scombroid poisoning symptoms usually start within 30 minutes of eating. These include flushing, itch, hives (urticaria), nausea, vomiting, stomach cramps, dizziness, palpitations and headache. Severe reactions may result in wheezing and dizziness or a drop in blood pressure. Urgent medical assistance is required. Treatment usually involves taking antihistamines, and sometimes adrenaline is given in a hospital setting. Scombroid poisoning can be identified by the pattern of symptoms and the absence of reactions with skin or blood allergy testing.

Anisakis Simplex

This is a nematode (worm) that is a fish parasite found in most parts of the world, including Australia. The parasite is killed when cooked at temperatures above 60°C or if stored in industrial freezers for two days. Anisakis can cause two major problems in people:

- Anisakis *infection* (anisakiasis) can result from eating raw or undercooked seafood. Infection may cause nausea, vomiting, stomach pain, and sometimes appendicitis, bowel blockage or bleeding. Symptoms occur due to inflammation in the gut. Diagnosis requires an endoscopy where a specialist doctor uses a tube to observe the inside of the stomach and bowel. The parasite usually gets destroyed by our immune system after three weeks, but surgery may be required.
- Anisakis *allergy* resembles other allergic reactions to food. In this case, the allergy is to the fish parasite, not to the fish itself. Reactions occur sometimes after eating seafood, rather than on every occasion. The allergens of Anisakis simplex are not destroyed by heat or cooking and so allergic reactions may be triggered by dead parasites in fish that have been well cooked. Blood allergy testing is available to confirm suspected sensitivity to this parasite.

Ciguatera Poisoning, Paralytic Shellfish Poisoning and Diarrhoetic Shellfish Poisoning

Ciguatera poisoning is caused by eating seafood that has been contaminated by algae-derived toxins. Ciguatera toxins are only present in fish, particularly large reef fish in the tropics. Paralytic shellfish poisoning and diarrhoetic shellfish poisoning is caused by shellfish contaminated with microorganisms (i.e. algae producing toxins), in particular mussels and oysters. These toxins or poisons interfere with the function of nerve endings.

Symptoms occur within two to three hours of eating contaminated food, and consist of tingling of the lips, tongue and throat, often followed by stomach upset, headache, fever, muscle aches and pains and in the case of ciguatera poisoning, sometimes changes in blood pressure and heart rhythm. Numbness, collapse, coma and confusion have also been described. Most people recover within a few days or weeks with supportive treatment.

Metabisulfite Reactions

Metabisulfite preservative can sometimes be used to stop crustaceans (such as prawns) from discolouring. This preservative is also used in wine, beer and some dried fruit as a preservative. Adverse reactions include wheezing/tight chest (more common in those with asthma), stomach irritation (such as nausea and pain), and rarely itch/rashes.

Toxic and other adverse reactions to seafood are outlined in the table below.

Table: Toxic and other adverse reactions to seafood

Cause	Seafood implicated	Clinical symptoms	Time of onset	Allergy test	
<u>Bacterial infection</u> Salmonella, Vibrio, Aeromonas, Listeria	Crustacean, Mollusc, Fish		Minutes to several hours	Negative	
<u>Viral infection</u> Hepatitis A, Rota- Astrovirus, Small round Viruses etc.	Crustacean, Mollusc			Dermatological	Negative
<u>Seafood parasites</u> Anisakis Diphyllobothrium	All fish and some molluscs			Gastrointestinal	Negative
<u>Toxins</u> 1) Scombrotxin <u>Marine Toxins</u> 2) Ciguatera toxin 3) Algae toxins	1) Fish, particularly with dark meat 2) Reef fish 3) All Mollusc species			Neurological	Negative
<u>Allergens</u> Shellfish	➤ Crustacean ➤ Mollusc ➤ Fish			Respiratory	Positive

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Content updated April 2024

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