

Cow's Milk Allergy – the facts

This Anaphylaxis Campaign fact sheet will mostly focus on infants and young children with a particular type of cow's milk allergy where the symptoms are *immediate*; that is, they usually occur within seconds or minutes of contact with cow's milk or a product containing cow's milk.



An abridged version of this section of the fact sheet – “Immediate onset cow's milk allergy in children (IgE allergy) – the key facts” – can be found in our website knowledgebase.

However, other important conditions where cow's milk can also act as the trigger will be addressed, such as **delayed cow's milk allergy** and **lactose intolerance**. As will be explained in the text, these other conditions require a different approach. Therefore, if you think you or your child may have one of these other expressions of adverse reaction to cow's milk; follow one of the links below.

Delayed cow's milk allergy – the common expression
Mixed delayed and immediate cow's milk allergy
Delayed cow's milk allergy - uncommon expressions
Lactose intolerance

The fact sheet then concludes with a short section on cow's milk allergy in adults, an uncommon cause of food allergy in this age group.

Cow's milk allergy in older children and adults

Cow's milk allergy is probably the most complex of all the food allergies and understandably families will often ask many of the following questions. We will aim to answer them, providing you with a better understanding of this acute or immediate expression of milk allergy. In particular, we hope to help you to minimise risks. Also we will signpost you to where further help and advice is available.

Throughout you will see brief medical references given in brackets. Full references are provided at the end.

Immediate cow's milk allergy

- What causes immediate cow's milk allergy and what broadly are the symptoms you should be aware of?
- How common is cow's milk allergy?
- How is immediate cow's milk diagnosed by healthcare professionals?
- How is immediate cow's milk allergy managed?
 - The treatment of any further immediate reactions
 - The preparation of an Allergy Action Plan

- The place of adrenaline devices
- Special diets needed and the support of a dietitian
- Is immediate cow's milk allergy outgrown and how can cow's milk be safely reintroduced into the diet?
- Is there a cure at present?

Immediate cow's milk allergy (IgE allergy) in infants and young children

What causes it and what broadly are the symptoms you should be aware of?

Immediate cow's milk allergy is well understood by doctors. It occurs when the body's immune (defence) system wrongly perceives some of the proteins in cow's milk to be a threat and, as a result, produces antibodies of the Immunoglobulin E class (known as IgE for short) specifically targeted against one or more of these proteins. An allergy of this kind is medically referred to as "**IgE mediated.**"

When the child again comes in contact with these milk proteins, they combine with the milk-specific IgE antibodies. This triggers certain chemicals such as histamine to be released from special immune system cells in the blood and tissues where they are stored. It is the sudden release of these chemicals in the body that causes the problem. Usually within minutes there will be visible skin symptoms of redness, hives or puffiness around the lips, mouth or eyes. The redness and hives may spread rapidly to become much more generalised over the skin. Gut symptoms of vomiting, abdominal pain or diarrhoea may also sometimes follow. More seriously, even sometimes in the absence of the skin signs there may be swelling in the mouth or in the throat. There can also be an acute attack of wheezing and coughing. Rarely there may be a fall in blood pressure leading to collapse. These more 'internal' symptoms are all much more serious. The medical term for such a severe allergic reaction is **Anaphylaxis** (see Anaphylaxis Campaign fact sheet on anaphylaxis).

Most children with immediate onset milk allergy first present with either the mild localised or more moderate generalised skin symptoms outlined above, which whilst uncomfortable for the child and worrying for the family are not potentially life-threatening. However experience shows that a subsequent accidental exposure to milk protein may cause more severe reactions in some children, so care must be taken.

It is important to discuss with your healthcare provider whether your child may suffer more severe allergic reactions if they are accidentally exposed to milk protein in future.

How common is cow's milk allergy?

Cow's milk allergy most commonly occurs during infancy and early childhood. Most children will develop symptoms before 6 months of age and it is, in practice, rare for it to start after the 1st year of life. It may either present as immediate onset IgE antibody mediated allergy or as delayed onset allergy where it is usually referred to as non-IgE antibody mediated allergy (see later section). The overall prevalence is difficult to determine but a UK population study carried out on the Isle of Wight estimates it as between 2-3% of infants (Venter et al 2006). The majority of children will present with non-IgE milk allergy but a significant number will present with the more immediate onset IgE type of milk allergy which this Anaphylaxis Campaign fact sheet is focusing mostly upon.

How is immediate onset cow's milk allergy diagnosed?

Your healthcare professional will know which infants are at higher risk and what symptoms should alert to the possibility of a milk allergic reaction.

Breast feeding is always the preferred way for an infant to be fed and fortunately immediate onset milk allergy rarely occurs in the exclusively breast fed infant. It usually occurs when formula milk is introduced to the infant's diet or on weaning onto solids when other dairy products are introduced. There is often but not always a close family history of allergy such as eczema, hay fever, asthma or food allergy in a mother, father, brother or sister. Typically the symptoms will present within minutes of the milk protein being ingested but there can be a delay of up to 2 hours. Skin symptoms are most commonly seen, then gastrointestinal, and less often respiratory. Cardiovascular symptoms (those affecting the heart and circulation) are rarely reported.

Skin	Apparent itching, redness, hives, puffiness, acute flaring of eczema
Gastrointestinal (the Gut)	Swelling of the lips, swelling of tongue or palate, difficulty swallowing , vomiting, diarrhoea, apparent abdominal pain
Respiratory (the Airways)	Runny or congested nose, sneezing, itchy red eyes, stridor/ hoarse cry, difficulty breathing, wheeze, cough, choking
Cardiovascular (the Heart and Circulation)	Lethargy, limpness, floppiness, sudden pallor, unresponsiveness

Serious symptoms, which have been **highlighted** above, point to an **Anaphylactic reaction** which is potentially life threatening. (See UK National Institute for Health and Care Excellence (NICE) Anaphylaxis Guideline 134 – a patient booklet, "Understanding NICE guidance". This has been produced for parents and carers and can be freely downloaded at www.nice.org.uk/guidance/CG134)

It is rare for immediate onset cow's milk allergy to first present in children with these **more serious symptoms of anaphylaxis**. However, should they occur, immediate emergency medical attention must be sought by dialling 999 and saying "anaphylaxis". Your child should be taken to the local hospital Accident and Emergency department. Following the initial emergency medical management, the NICE Anaphylaxis guideline then recommends a short period of inpatient observation under a paediatric medical team as a second allergic reaction can occur within 6-8 hours. Before discharge, an adrenaline auto injecting device should be prescribed with advice as to how to use it and when it may need to be given for any subsequent severe accidental reaction.

Prompt referral to a specialised allergy outpatient service should also be made for more thorough assessment, allergy testing and on-going care and monitoring.

As soon as any immediate allergic reaction to cow's milk allergy is suspected, any source of cow's milk protein must be kept out of your child's diet. Prompt advice from a healthcare professional as to how best to do this is usually needed.

However, it is much more likely that your child has shown the milder or more moderate symptoms outlined above, such as hives, swelling of the lips, vomiting or diarrhoea. If you suspect your child has had any of these symptoms you should see your GP as soon as possible. Some GPs have a clear understanding of allergy, but immediate onset allergy is a specialist subject so it is more likely that your doctor will need to refer you to an allergy clinic. The NICE Clinical Knowledge Summary (NICE, 2014) on cow's milk allergy in children aged 5 years and younger does state that for this immediate onset expression of milk allergy: "diagnosis and management is more likely to be done in secondary care."

Your GP can locate an allergy clinic in your area by visiting the website of the British Society for Allergy and Clinical Immunology (BSACI) www.bsaci.org.

Once you get a referral, a member of the allergy team will discuss your child's symptoms with you in more detail as well as your family's possible wider history of allergy. This is called taking '**an allergy-focused clinical history**' and you can learn more about this and the subsequent planned allergy tests in the **NICE food allergy** guide for parents and carers: "Testing for food allergies in children and young people". This is freely available for you to download at www.nice.org.uk/guidance/CG116.

Taking this allergy-focused clinical history, individualised to your child's presenting symptoms, is the most important part of the diagnostic assessment of your child and only after it has been taken, should the possibility of **allergy tests** be discussed with you. The choice lies between skin prick tests with milk protein and/or blood tests looking for the presence of milk protein antibodies. Often skin prick tests will be suggested as they can quickly and easily be carried out at this initial consultation. They are usually well tolerated by the child and the results will be available in 15-20 minutes. In most cases of IgE milk allergy the history is clear and the diagnosis is then supported by either a positive skin prick test or blood test. The actual size of the test result does not reflect the severity of the allergy but the more positive the result the more confidently the diagnosis can be confirmed. However should the history be less clear and/or the allergy test not positive, a carefully supervised milk challenge can be carried out by the specialist allergy team, usually scheduled for a later date.

Tests not recommended to diagnose milk allergy

In recent years there has been an increase in certain food allergy tests being offered by complementary or alternative health practitioners. NICE have investigated these tests and having failed to find any scientific evidence to support them, they have stated clearly that **they have no place in the diagnosis of food allergy** (NICE, 2011) (NICE, 2014). Such tests include:

- Vega test
- Applied kinesiology
- Hair analysis
- IgG antibody blood testing

The atopy patch test has no place in diagnosing immediate onset IgE milk allergy.

How is it managed?

Following the careful confirmation of the diagnosis of immediate onset IgE milk allergy:

Practically there is a high risk of subsequent accidental contact occurring because milk protein is present in so many foods and it is also so commonly present within the home and anywhere outside the home where food and drink are being consumed. Therefore in all cases we recommend that a written **Allergy Action Plan** for your child should be agreed between you and your child's treating doctor to cover all possible subsequent accidental reactions. The British Society for Allergy and Clinical Immunology has developed standardised written plans which can be freely accessed by your healthcare professional at www.bsaci.org and searching under 'Allergy Action Plan'.

A key further part of your child's assessment will include a discussion with you as to whether there is now a risk of a subsequent accidental severe reaction occurring.

Your doctor will look for and consider both major and minor risk factors in making this assessment.

The 2 major risk factors for a further accidental reaction being severe are:

1. If the initial reaction was severe with symptoms of Anaphylaxis
2. A mild or moderate initial reaction but the child has on-going asthma symptoms

However the initial reaction is uncommonly a severe reaction and most children first develop symptoms of milk allergy at an early age when asthma is unlikely to be present. Therefore the overall risk of a subsequent severe accidental reaction will often be assessed as low, avoiding the need for an adrenaline device to have to be prescribed.

Severe reactions will usually only occur when the milk protein is actually ingested although reactions can be triggered by either touch or inhalation.

Reactions through touch and inhalation

A splash of milk on the skin can cause immediate symptoms such as redness or hives, otherwise known as urticaria. Inhaled cow's milk protein which can occur where milk or milk products are being heated, cooked or prepared can also cause immediate reactions in very sensitive people. In coffee shops, "frothing milk" has been known to cause itchiness in the eyes and nose. Based on clinical experience, these reactions are unlikely to be life-threatening for the vast majority of milk allergic children. However, it is sensible to be cautious and if your child's milk allergy is particularly severe, you should talk to your allergy team about these types of contact reactions with milk.

Also, if the milk were to get through a cut in the skin, onto the lips or in the eye then it is more likely a reaction could be more serious. The area of contact with the milk should be washed with liberal quantities of water. If a severe reaction is suspected, emergency treatment will be necessary.

There are other factors that can adversely influence the clinical degree of a subsequent reaction:

- The child's general health on the day, e.g. whether he/she has a viral infection at the time
- The amount of milk protein ingested – usually very little is needed to cause an immediate type reaction and if a significant amount is ingested then a more uncomfortable reaction is more likely to occur
- The form of milk protein ingested e.g. formula milk, plain milk, cheese, yoghurt, a baked milk product such as a cake or bun – the less heated/ baked the milk protein is the more allergenic it usually becomes.
(See later diet section)

Again, your healthcare professional will weigh up all of the above factors before agreeing your child's **Allergy Action Plan** with you.

The Written 'Allergy Action Plan' for the emergency treatment of any further immediate reactions

Oral Antihistamines - e.g. Cetirizine

These are usually sufficient to treat mild to moderate immediate symptoms, which are most often skin symptoms. An antihistamine should always be readily available for most children with any expression of immediate IgE milk allergy. The dose for your child will be agreed and will be included in this written plan.

Inhalers – a 'reliever' inhaler e.g. Ventolin (salbutamol)

If your child suffers from asthma, or has respiratory symptoms such as breathing difficulties, coughing or wheezing, a reliever inhaler may have been prescribed and the dose can then be included into the action plan if it is thought appropriate.

Adrenaline - always the first line medication for a suspected anaphylactic reaction

If your child's allergy is assessed as putting them at risk of any subsequent accidental reaction being severe (anaphylaxis), they will usually also be prescribed **adrenaline** (also known as epinephrine). This will be in the form of an auto injecting device.

The three adrenaline auto-injectors currently available to be prescribed in the UK are EpiPen, Jext and Emerade. These auto-injectors are easy to use and designed for self-administration. If your child is prescribed adrenaline, it should be available at all times and within its expiry date – with no exceptions. Immediate medical attention should be sought after use by dialling 999 and saying 'anaphylaxis' (as per the BSACI Allergy Action Plan).

You will need to know how and when to use it and the prescribing healthcare professional should see that this advice is given. You can also find help on the website relevant to the injector you will be carrying for your child.

EpiPen: www.epipen.co.uk Jext: www.jext.co.uk Emerade: www.emerade.co.uk

There is considerable ongoing debate in UK specialist allergy services as to whether one or two devices should be available to patients at each location. Your allergy team will advise on the number of devices that you will need for your child. The view of the Anaphylaxis Campaign is that **two** devices should be available at any particular location in case one is broken or misfires, or a second injection is needed before emergency help arrives.

Special diets needed and the support of a dietitian

The initial advice following the diagnosis of milk allergy is usually the complete avoidance of cow's milk and foods containing cow's milk in your child's diet.

Appropriate verbal and written advice adapted to the age of your child should be given to you.

The recent NICE Clinical Knowledge Summary on the management of children with milk allergy (<http://cks.nice.org.uk/cows-milk-protein-allergy-in-children>) does clearly recommend early and ongoing dietetic support. This referral will be made by either your GP or allergy clinic. Whilst waiting to be seen by the dietitian, it would be helpful if your doctor is able to give you some initial verbal advice and supply some written advice.

The British Dietetic Association (BDA) provides a helpful list of alternatives to cow's milk which can be accessed free of charge at www.bda.uk.com/foodfacts, under 'Babies, Children & Pregnancy'.

The Anaphylaxis Campaign can provide information, advice and ongoing support on immediate cow's milk allergy. Call our Helpline on 01252 542029.

There are also useful websites recommended by NICE for parents to access:

<http://cowsmilkproteinallergysupport.webs.com/> www.cmpasupport.org.uk

<http://www.allergyuk.org/downloads/resources/Aptamil%20Leaflet%20Final%20LR.pdf>

Please do remember that these other website resources will be guiding on both immediate and delayed milk allergy and this fact sheet is focusing mostly on the immediate expression. However the dietary advice is essentially largely applicable to both expressions and these are useful resources. Gradually you will become used to reading food labels and asking the right questions when you as a family are eating outside the home. A useful government site to help you understand how to read labels more easily is: <http://www.food.gov.uk/multimedia/pdfs/publication/allergy-leaflet.pdf>

Infant feeding

The importance of breastfeeding in cows' milk allergy

The incidence of cow's milk allergy is lower in exclusively breastfed infants compared to formula-fed or mixed-fed infants. Only about 0.5% (1 in 200) of exclusively breastfed infants are allergic to the cows' milk in the mother's own diet and most symptoms are mild to moderate (Vandenplas et al., 2007). Immediate onset milk allergy usually presents when cow's milk-based infant formula is introduced or when other sources of dairy products containing milk protein are introduced as the child is weaned onto solids.

If your breastfed infant has been diagnosed with cow's milk allergy you should continue to breastfeed and seek urgent specialist allergy help including dietetic advice to ensure you avoid all cows' milk from your diet (Isolauri et al., 1999). You are likely to need calcium and vitamin supplements during this process to ensure you still get these necessary nutrients in your diet (NICE, 2014).

Alternatives to milk protein

The hypoallergenic formulas – available on prescription only

You will usually be recommended one of these hypoallergenic infant formulas where the protein content has been specially prepared. They are either made from cow's milk that is treated (extensively hydrolysed) to significantly reduce the allergenicity of the milk proteins or made from individual amino-acids, the basic building blocks of all proteins. These latter 'amino-acid formulas' essentially have no allergenic protein in them at all.

Infants with either mild to moderate immediate or delayed milk allergy will usually tolerate 'extensively hydrolysed formulas'. However children with either severe immediate or delayed milk allergy should usually be commenced on an 'amino-acid formula'. These two groups of hypoallergenic formulas are only available on prescription and your doctor will know which one to prescribe. They are all designed to be nutritionally complete milks for your child.

'Milks' not suitable as 1st line replacement

The 'Comfort' range of formulas

There is a further group of special formulas where the cow's milk protein is only partially broken down; these are the 'Comfort' range of formulas. They are available over the counter. However they are not sufficiently hypoallergenic to have any role in either the diagnosis or on-going management of cow's milk allergy in children (NICE, 2014).

Soya protein-based formulas

These are **not** considered a suitable alternative to cow's milk for infants less than six months old. However, following expert advice from a healthcare professional experienced in allergy management, they can be used in some children over 6 months of age who have been shown to have no allergy to soya. (British Dietetic Association, 2010).

Rice milk and other milk substitutes

Rice milk is **not** advised before the age of 4.5 years because of its potential high natural arsenic content.

Ready-made soya, oat, coconut, almond, pea and other 'milk' substitutes may be used after 2 years of age or perhaps earlier in the 2nd year of life at the discretion of your dietitian. This is due to their more limited nutritional value. A brand fortified with calcium should be used where possible.

(NICE milk allergy guideline, 2014).

Milk from other mammals

The milks from all mammals share to varying extent similar proteins and therefore **none** of these alternative mammalian milks are recommended for use. The milk from those mammals that are most closely related to humans, goats, sheep, and buffalo, are the mostly likely to cause similar allergy symptoms. The milk from donkeys, horses and camels are perhaps a little less likely to cause such symptoms.

(World Allergy Organisation milk guideline, 2010).

Weaning onwards:

Children with immediate cow's milk allergy should initially avoid milk in all forms. As well as the obvious ingredients (such as cream), avoid the following:

- Cheese
- Yoghurt
- Butter, butter fat, buttermilk or butter oil
- Ice cream (even when sold as non-dairy – products called ice cream in the UK must contain at least 2.5% milk protein)
- Fromage frais
- Crème fraiche

This is not a full list and there are many other food products that contain milk protein. Many pre-packaged foods (such as crisps, snacks and ready meals) contain milk while others don't. It can appear in unexpected products. For instance, cow's milk proteins are included in some energy drinks and some fruit drinks. By law, cow's milk must always be declared and highlighted in the ingredient list when present in pre-packaged food. It is important to check food labels thoroughly every time you shop – even if you have bought a product before. Recipes do sometimes change. There is recent European-wide law that requires food outlets selling non-packaged foods and catering establishments to provide information on major allergens, including milk.

Sometimes you may see such terms as casein, whey, sodium caseinate and calcium caseinate. These are all types of milk protein and must be avoided.

Your dietitian will help you understand exactly what to avoid and ensure that your child will still be getting a good balance of nutrients, especially calcium which is such an important constituent of cow's milk.

When preparing food at home, care should be taken to ensure that cross contamination does not occur. Separate utensils and dishes should be used where necessary and then washed thoroughly (not just rinsed).

See also **Plain chocolate** and **Pharmaceutical agents containing milk**

Is immediate type cow's milk allergy outgrown?

The reintroduction of cow's milk safely back into the diet

In the great majority of cases, all types of cow's milk allergy resolve during childhood. The speed with which this tolerance develops varies greatly, so the appropriateness and timing of reintroduction will need to be individually assessed by your healthcare professionals. Delayed onset non-IgE will usually resolve more rapidly than immediate onset IgE allergy. (Luyt et al., 2014; BSACI milk allergy guideline).

The most recent evidence suggests that approximately 50% of children with immediate onset milk allergy will outgrow it by 5 years of age. (Sicherer et al., 2010; Elizur et al., 2012). Thereafter it can still resolve but a few children will carry their allergy into adult life.

Immediate onset milk allergy is more likely to persist in a child if: (BSACI milk allergy guideline, 2014)

- The initial or subsequent reactions were severe
- The child reacts to even baked milk products
- The positive allergy skin prick tests or the blood tests are in the higher ranges
- There are other food allergies present, most commonly egg allergy
- The child goes on to show other clinical allergies such as asthma or allergic rhinitis (e.g. triggered by dust mite/pets/grass pollens).

Heated or baked milk

Heating alone does not change the allergic potential of cow's milk: so the allergic child will also react to boiled milk. However when milk is baked with, for example wheat, binding between the milk and the wheat 'hides' to a certain extent the milk proteins, thereby reducing their allergenic potential. There is now growing evidence that if the milk allergic child can be shown at an earlier age to tolerate baked milk and then allowed to eat it on a regular basis their acquired full tolerance to all forms of milk protein can be speeded up. In an American study, 75 per cent of children with immediate cow's milk allergy (IgE-mediated) were able to tolerate baked milk without suffering a reaction (Nowak-Wegrzyn et al., 2008).

In UK specialist allergy practice it is therefore becoming increasingly common practice to discuss with the families of young children with immediate onset milk allergy the possibility of carrying out a planned baked milk challenge. In some milder cases your allergy specialist may allow a home reintroduction of the baked milk (Luyt et al., 2014) but it is usually advised to be carried out as a supervised day patient challenge procedure. If the challenge is not tolerated then your healthcare professional will discuss with you if it should be repeated, perhaps some months later.

When your child does pass this challenge with baked milk, then a 'Milk Ladder' approach will usually be recommended. Such ladders are designed to start with several baked milk product as first 'steps' and then to 'climb up' the ladder in individual steps of gradually less well baked/treated and therefore potentially more allergenic milk protein products.

How far each child will be allowed to progress up this ladder will need to be individually decided and monitored by your dietitian or doctor. The final step of each ladder will be a planned challenge with fresh milk and when and where this is carried out will need to be carefully decided by your allergy specialist.

Is there a cure at present? – Oral Immunotherapy

One day it may be possible to “cure” people of their food allergy – including milk allergy – by means of a treatment called oral immunotherapy (OIT). This works by slowly introducing small amounts of the problem food into the allergic patient’s diet and gradually building up to larger amounts. This must be done under strict medical supervision. It is hoped then that eventually the immune system will learn to tolerate the food. Various research centres are testing whether OIT works for children with milk allergy and the early results are encouraging. **However, it will probably take some years before the safety and effectiveness of OIT for milk has been fully established** (Luyt et al., 2014), but this does offer real hope for some families who might otherwise have to face a possible lifetime of milk allergy for their child.

Delayed cow’s milk allergy (the correct medical term is non-IgE cow’s milk allergy)

The common expression

Formerly referred to as cow’s milk protein intolerance, this form of milk allergy can occur uncommonly with breast feeding alone (exclusive breast feeding) due to the small amount of cow’s milk protein that passes across into the breast milk when the mother herself consumes cow’s milk or dairy products but is more likely to occur later in such breast fed infants when the time comes for formula, dairy products or cow’s milk to be added into the breast fed infant’s own diet. However it is much more likely to occur in infants who are only being bottle fed.

As with immediate onset milk allergy, there is often but not always a close family history of allergy such as eczema, hay fever, asthma or food allergy in a mother, father, brother or sister.

It is much less easy to diagnose than immediate onset milk allergy because the symptoms can occur hours or even days after ingestion. Also the allergy tests for immediate allergy, skin prick tests and bloods tests, have no role to play because whereas immediate cow’s milk allergy involves the antibody called Immunoglobulin E, delayed cow’s milk allergy has a different mechanism probably involving some of the special cells of the immune system.

Also, the symptoms often mimic common ailments in infants such as colic, reflux, disturbed stools and eczema. Important clues however that they might be due to milk allergy are that the symptoms do not respond to the usual management approaches; also a pattern of symptoms is often present mostly commonly affecting the upper gut and/or lower gut and a little less commonly, the skin.

The **typical mild to moderate symptoms** are one **or very often more than one** of the following with again the gastrointestinal ones being usually the most prominent:

Gastrointestinal (the Gut)

- Upper gut: Reflux, vomiting, colic, refusing or disliking being fed
- Lower gut: Loose or frequent stools, redness around the bottom, constipation (especially straining to pass even a soft stool), apparent pain in the tummy, a little blood or slime in the stools of an otherwise well infant (the latter mostly occurring in breast fed infants)

Skin

- Itching of the skin, redness of the skin, unexplained skin rashes, significant eczema (dry inflamed itchy patches of skin)

Respiratory (the Airways)

- Sometimes airway/nasal 'snuffly' or 'catarrhal' symptoms - but usually along with some of the other symptoms above

Should any of these symptoms be affecting your child, you should discuss them promptly with your health visitor or GP.

NICE have produced a helpful booklet for parents and carers: "Testing for food allergies in children and young people". This will outline how your healthcare professional should then take an allergy focused history from you individualised to your child's particular symptoms. This is freely available for you to download at www.nice.org.uk/guidance/CG116.

If it is then suspected that the symptoms may be an expression of mild or moderate delayed onset non-IgE cow's milk allergy, NICE recommends that these children can be both diagnosed and managed in general practice. There is a UK Milk Allergy in Primary Care (MAP) guideline (Venter C. et al MAP guideline 2012) written by some of the healthcare professionals on the NICE food allergy guideline development group to show how best this should be done. It can be freely accessed at www.ctajournal.com/content/3/1/23

As there are no skin or blood tests for delayed onset cow's milk allergy (Non-IgE allergy), the only reliable test is to take all the cow's milk protein out of the diet of the exclusively breast feeding mother or out of the diet of the bottle fed infant and then to later reintroduce it in a planned way.

All cow's milk and cow's milk containing foods must be removed from your diet if exclusively breast feeding or from your infant's diet **for a period of 2 to 4 weeks**, as this is the time it may take for the symptoms to improve. Your healthcare professional will advise how your diet will need to change if you are exclusively breast feeding and will also prescribe a daily calcium and vitamin D supplement for you or if you are bottle feeding will prescribe a special nutritionally complete low allergen formula (hypoallergenic formula –see earlier text) for your infant. If he/she has already been started to be weaned onto solids you will be advised how to remove all cow's milk protein from their weaning food. During the trial, the symptoms will either begin to improve, suggesting the presence of allergy, or there will be no change, which usually excludes the diagnosis of allergy

At the end of the 2 to 4 weeks, unless your child's presenting symptoms have been assessed as severe, you should be asked to reintroduce the cow's milk protein.

If exclusively breast feeding you can simply start eating dairy products again. If your infant is bottle fed the previous cow's milk based formula can be reintroduced and your doctor or dietitian will provide you with details of how to do this gradually, safely and easily at home. This will show whether any improvement seen in symptoms during the trial was actually due to cow's milk allergy and not just to your infant improving naturally. If allergy is the cause, the symptoms can be expected to return within the first few days of reintroducing the milk protein, but usually settle well again as the milk free diet is restarted.

As we have already said many of the symptoms of delayed milk allergy commonly overlap with other simpler ailments in young infants e.g. reflux, colic, disturbed stools, eczema. Therefore if the diagnosis is not confirmed in this way delayed milk allergy is likely to be over diagnosed and lead to both the inappropriate management of these symptoms as well as subjecting your infant to an unnecessarily restrictive diet. By following this careful protocol, **the diagnosis of delayed non-IgE cow's milk allergy can then be properly confirmed or excluded**. When the diagnosis is confirmed, the next steps in management will be explained to you and they should importantly include the on-going support of a dietitian.

Uncommonly delayed non-IgE milk allergy can cause **more severe expressions** of the above gut and/or skin symptoms; perhaps also in the presence of faltering growth (see later text). A prompt referral to an allergy clinic is then advised. Again, the MAP guideline signposts which symptoms this applies to and gives the necessary advice as to how the diet of your child has to be changed whilst awaiting more specialised assessment.

Mixed Delayed and Immediate cow's milk allergy

Occasionally children may begin to show a potential to develop symptoms of both a delayed and immediate onset character. This is most likely to happen in the children who first present with mild to moderate delayed onset symptoms, and who have atopic eczema and/or a close family history of a mother, father or siblings with eczema, hay fever, asthma or food allergy. Having been commenced on a cow's milk free diet for their delayed onset symptoms, subsequent accidental ingestions may begin to show more immediate symptoms suggesting that alongside their delayed symptoms they now also have evolved immediate symptoms and therefore a mixed non-IgE and IgE expression of allergy. This is not common and your doctor will know to watch out for this.

Alternatively, when children uncommonly present with severe non-IgE symptoms, either severe gut and/or severe eczematous skin symptoms and perhaps faltering growth is also present - then a mixed non-IgE and IgE expression of milk allergy may be the case. Should such clinical expressions be suspected, then more specialist allergy care will usually be indicated for their on-going monitoring and management. The MAP milk allergy guideline does signpost these children in that direction for their on-going care.

Examples of these more serious but predominantly still non-IgE expressions of milk allergy would be:

Eosinophilic Gastrointestinal Disorder (EGID)
Food Protein Induced Enteropathy Syndrome
Food Protein Induced Enterocolitis Syndrome (FPIES).

Delayed Cow's Milk Allergy – Uncommon expressions

Cow's milk allergy is probably the most complex of all the food allergies and this is well seen in certain uncommon expressions of delayed cow's milk allergy.

Cow's milk-induced proctocolitis

Characteristically more likely to be seen in breast fed infants. It usually presents in the first one or two months of life with a little fresh blood, sometimes mixed with mucus (slime), appearing in the stools. Typically, the infant is otherwise very well although there may be mild colic symptoms also present. Understandably the presence of blood can cause concern but it will usually clear quickly when the mother takes all milk and dairy products out of her own diet. The doctor may then advise a brief reintroduction of cow's milk protein into the infant's diet just to confirm the diagnosis, before returning to and continuing the cow's milk free diet for a period of time under the supervision of your doctor and/or dietitian. Often this expression of milk allergy will naturally resolve around the age of 1 year or early in the second year of life (NSAID, 2010: Guidelines for the diagnosis and management of food allergy in the USA).

Cow's milk protein-induced enteropathy syndrome

This allergy syndrome presents in young infants with chronic and persisting diarrhoea usually associated with faltering growth. It can be due to different food proteins, but cow's milk protein is the commonest trigger. The diagnosis is based on the recognition of this pattern of symptoms by your doctor, resolution of the symptoms when cow's milk protein is removed from the infant's diet and if indicated, recurrence of symptoms following a planned oral food challenge with milk by a specialist allergy service. Most children can be expected to tolerate having milk protein introduced again into their diet by 2 to 3 years of age. Until that happens, it is important for your child to be under the supervision of a doctor and dietitian with experience of this serious expression of milk allergy in early life (NSAID, 2010: Guidelines for the diagnosis and management of food allergy in the USA).

Food protein-induced enterocolitis syndrome (FPIES)

This is a severe gut and more generalised 'internal' allergic response to food protein, cow's milk protein again being the commonest cause. It is rare in breast fed infants. It also presents in infancy but manifests predominately as profuse and repetitive vomiting with resulting listlessness usually 2 to 4 hours after ingestion of the milk protein. It may then be followed with significant diarrhoea. Understandably, it can cause a very severe acute illness picture which can easily be mistaken for the onset of an acute severe infective illness. The attending doctor needs to be alert to this possible underlying cause of milk allergy. It is not unusual for one or two such self-resolving episodes to occur before the true cause is recognised. The diagnosis is based on the recognition of this pattern of symptoms by your doctor, with resolution of the episodes when cow's milk protein is removed from the infant's diet. The clinical story is often sufficient to make the diagnosis, especially when more than one such episode has occurred following milk ingestion. Should a challenge to confirm the diagnosis still be needed, this decision has to be taken carefully by a doctor experienced in serious food allergy and also carried out in a carefully supervised hospital environment. In time, usually within the preschool years, most children will be able to tolerate milk protein again.

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However the decision when to test for this in a carefully supervised hospital environment again is best taken by a specialist allergy service (NSAID, 2010: Guidelines for the diagnosis and management of food allergy in the USA; Luyt et al., 2014).

Eosinophilic Gastrointestinal Disorder (EGID)

Along with a specialist allergy service, a paediatric gastroenterology service will also need to be involved in both the diagnosis and subsequent management of this condition.

Overall, this immune system-mediated condition is uncommon, but prevalence in the UK may be increasing. The typical presentation in the infant age group is Eosinophilic Oesophagitis (EoE). A combination of the following symptoms and a possible family history of allergy or allergic eczema may suggest further investigation for EoE:

- Food refusal, with screaming and back arching during feeds
- Vomiting
- Possible faltering growth/poor weight gain

The diagnosis usually needs to be confirmed by an endoscopic examination under anaesthetic of the oesophagus (gullet). This allows both a direct visual examination to be carried out along with importantly several small biopsies of the lining of the oesophagus. The presence of a certain number of these special immune cells, the eosinophils, under the microscope then confirms the diagnosis. The child will then usually come under the joint specialist monitoring of both the allergy and the gastroenterology teams. Dietary elimination is the most effective treatment for infants. (Epstein and Warner, 2014). Often several food triggers may be active with milk being the commonest one.

EGID has only been recognised relatively recently and therefore the natural history is not yet clearly defined, but it would appear to be potentially quite a persistent condition for a number of these children.

It is considered **a mixed non-IgE and IgE clinical expression of CMA**

Lactose intolerance

The sugar in cow's milk and in breast milk is called lactose. An enzyme called lactase, present in the gut is needed to break this complicated sugar into smaller sugars that the body can then absorb and use. As young children grow up and drink less milk, the amount of this enzyme gradually and naturally falls. For some children, especially those from an Asian or African ethnic background this may happen to a greater degree and this may mean that over time not all the lactose they consume is broken down. Very gradually gut symptoms begin to develop. These symptoms may include bloating, tummy pains, wind and very loose stools – it does not include constipation or reflux/vomiting. However this does not usually happen until later in childhood and certainly it is very unlikely to occur in the infant period when milk allergy typically first presents. However, uncommonly it can be triggered for a transient period by an acute gastroenteritis infection in a child of any age.

Your doctor should be aware and be able to advise on the management of these two possible expressions of lactose sugar intolerance. However there is still widespread evidence in the UK that infants with symptoms of cow's milk protein allergy are being incorrectly diagnosed and managed as lactose intolerance (Sladkevicius et al., 2010).

Cow's milk allergy in older children and adults

Cow's milk allergy may either first present in adult life or persist from childhood. It is however rare in the adult age group with an estimated prevalence of approximately 1 adult in 200. (Woods RK et al 2002) (Zuberbier et al., 2004). Compared to children, it is more likely to be severe and persistent. One report showed that two-thirds presented with severe immediate symptoms affecting the respiratory and cardiovascular systems, of whom about 25% had experienced anaphylactic shock. Subsequently none of the patients in this group became tolerant during a period of observation ranging from 3 to 40 years. (Luyt et al., 2014)

The majority of adult milk allergic patients also have asthma. Therefore emergency treatment with adrenaline should always be considered and these patients should be under the care and monitoring of clinicians experienced in the care of severe food allergy in adults. (Luyt et al., 2014)

Plain chocolate

Although plain chocolate (also known as dark chocolate) does not usually have milk as an intentional ingredient, there can be a high risk of cross-contamination on the production line. The Government's Food Standards Agency accepts that this is a risk. The Anaphylaxis Campaign advises anyone with immediate cow's milk allergy to be extremely cautious of plain chocolate. Some manufacturers of specialist brands claim to have removed the risk of cross-contamination. If you think this may be the case with a particular brand, contact the manufacturer.

Pharmaceutical agents containing milk (Luyt et al., 2014)*

Where cow's milk is used in the manufacture of pharmaceutical agents, traces of milk protein may persist in sufficient amounts to elicit reactions in highly sensitive cow's milk allergic individuals. Agents that should be particularly considered are **probiotics** cultured in media that include milk proteins or others that contain lactose as an active ingredient. Current legislation does not require manufacturers to indicate on the label the characteristics of their culture medium. It is therefore advisable to seek out products that are clearly labelled to contain no food allergens.

Lactose is commonly added to tablets and oral suspensions (e.g. antihistamines), intravenous formulations and dry powder inhalers for asthma. However pharmaceutical grade lactose is obtained from skimmed milk by coagulating and filtering out cow's milk proteins. As this is regarded as a very efficient process, product information inserts do not warn consumers of the possibility of an allergic reaction to cow's milk protein in lactose-containing medicines. Allergic reactions are therefore highly unlikely in most allergic individuals. Should such a reaction occur, lactose free alternatives can then be recommended.

Condoms

Milk protein is used in the manufacture of most condoms. We have heard reports of people with milk allergy reacting with skin irritation and soreness. If this is a concern for you, we recommend that you contact individual manufacturers of condoms to find out if they do indeed use milk protein in their manufacture of their condoms. We are not aware of any medical evidence that determines how risky this is.

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* The section on "Pharmaceutical agents containing milk" is reproduced from the BSACI guidelines with the kind permission of Dr Andrew Clark, Chair of the Standards of Care Committee (SOCC) committee of the BSACI

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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 with 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 and follow us on Twitter [@Anaphylaxiscoms](https://twitter.com/Anaphylaxiscoms)