

Coeliac disease

food allergy
& intolerance

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An introduction

Coeliac disease is a condition that occurs in genetically predisposed individuals, and is characterised by reversible small intestinal mucosal damage caused by permanent hypersensitivity to dietary gluten.

The Gut Foundation together with the Allergy Unit at the Royal Prince Alfred Hospital provides professional and public education and promotes research into Coeliac disease.



The prevalence of coeliac disease

Coeliac disease is a lifelong condition affecting the small bowel of genetically susceptible individuals. Small bowel biopsy is essential to confirm the diagnosis. Treatment is a strict gluten-free diet that excludes wheat, rye and barley. The diet should be supervised by a dietitian. Follow-up is necessary because of potential long-term complications.



The condition is characterised by villus atrophy (FIG 1) of the small bowel lining, associated with extensive surface cell damage and infiltration with inflammatory cells. The disease has a wide range of presentations from those with no symptoms whatsoever through fatigue, vague abdominal problems, weight loss and diarrhoea and on to severe malabsorption of dietary nutrients, sometimes associated with large amounts of fat in the motion. Usually the symptoms and the abnormal small bowel lining resolve on removal of gluten from the diet.

What is it?

Coeliac disease or gluten sensitive enteropathy is a chronic malabsorptive disorder affecting the small intestine.

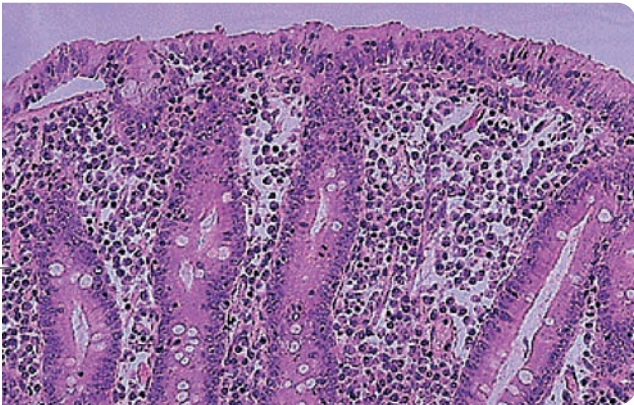
It is caused by exposure to dietary gluten in genetically predisposed individuals.

This booklet will help you understand this disorder and it's treatment.

FIG 1] SMALL BOWEL BIOPSY



A] NORMAL VILLI



B] VILLUS ATROPHY IN COELIAC DISEASE

The age of presentation and prevalence of coeliac disease have altered over the last forty years. Coeliac disease was previously thought to be a disease of childhood, but now adult presentation is increasingly common.

Coeliac disease can present at any age. The prevalence between countries varies widely. Several European studies recently revealed prevalence close to 1:100 (United Kingdom, Finland, Italy and Sweden). The United States figures

have recognised the common nature of coeliac disease with a recent study involving antibody tests in blood donors suggesting 1:250 as a more likely prevalence. Australian data is not well documented although a similar prevalence of 1:250 has been reported.

Coeliac disease has been considered a disease predominately of Caucasians although it is now known to also occur in Indians and Arabs. It remains very uncommon in Africans, Japanese and Chinese.

Coeliac disease is an HLA-associated condition, the primary association being with major histocompatibility complex class II alleles DQA1*0501 and DQB1*0201. Coeliac disease is seen in about 10% of first-degree relatives and there is a 70% concordance in identical twins.

The concept of a 'coeliac iceberg' is accepted. The majority of cases are clinically undetected, either 'silent' or 'latent' disease.

Silent coeliac disease refers to those without symptoms but an abnormal small bowel biopsy. Latent coeliac disease may be present in individuals with a normal small bowel lining on a normal diet who either in the past or in the future will develop villus atrophy responsive to gluten withdrawal.

Clinical features

Adult presentation usually involves weight loss, diarrhoea, tiredness and often anaemia.

However other presentations including miscarriage, infertility, osteoporosis, mouth ulcers, and irritable bowel type symptoms are common. Children frequently present with failure to thrive, vomiting, diarrhoea, muscle wasting, and general irritability. Sometimes they have a 'pot belly'.

Associated diseases include diabetes, thyroid problems and Sjogren's syndrome. Coeliac disease should always be considered with unexplained folic acid, iron or vitamin B12 deficiency, osteoporosis and osteomalacia.

An unusual skin condition (dermatitis herpetiformis) with an itchy blistering rash is also related to gluten sensitive bowel disease.

Diagnosis

The diagnosis of coeliac disease requires microscopic examination of a biopsy specimen from the small bowel.

Multiple biopsies (at least 3) should be taken from the second or third part of the duodenum due to the variable nature of the changes that may be seen.

Biopsies are usually obtained during upper endoscopy when coeliac disease is suspected.

The characteristic findings on biopsy include (FIG 1)—

- 1] Partial or complete villus atrophy
- 2] Crypt hyperplasia
- 3] Increased intra epithelial lymphocytes or plasma cells.

SEROLOGICAL TESTS IN COELIAC DISEASE

Serological test	Sensitivity (%)	Specificity (%)	Positive Predictive Value	Negative Predictive Value
AGA				
IgA	75–90	82–95	28–100	65–100
IgG	69–85	73–90	20–95	41–88
EMA Indirect Immunofluorescence	85–98	97–100	98–100	80–95
TGAA	93–96	99–100	83	93

LEGEND: SEE PAGE 6

Screening

Serological tests which are highly sensitive and specific are now available and are useful in screening for coeliac disease.

Indications for screening include patients with—

- 1] Suspected coeliac disease
- 2] Conditions associated with coeliac disease
- 3] First and second degree relatives
- 4] Clarification of response to a previously trialed wheat free diet.

It is important to remember that coeliac disease can sometimes occur in the absence of serological evidence of the condition and small intestinal biopsy should always be performed if the clinical suspicion is strong. Patients who have only partial villus atrophy are less likely to have a positive antibody result. Abnormal serology alone is not sufficient to make a positive diagnosis of coeliac disease.

Serological tests include—

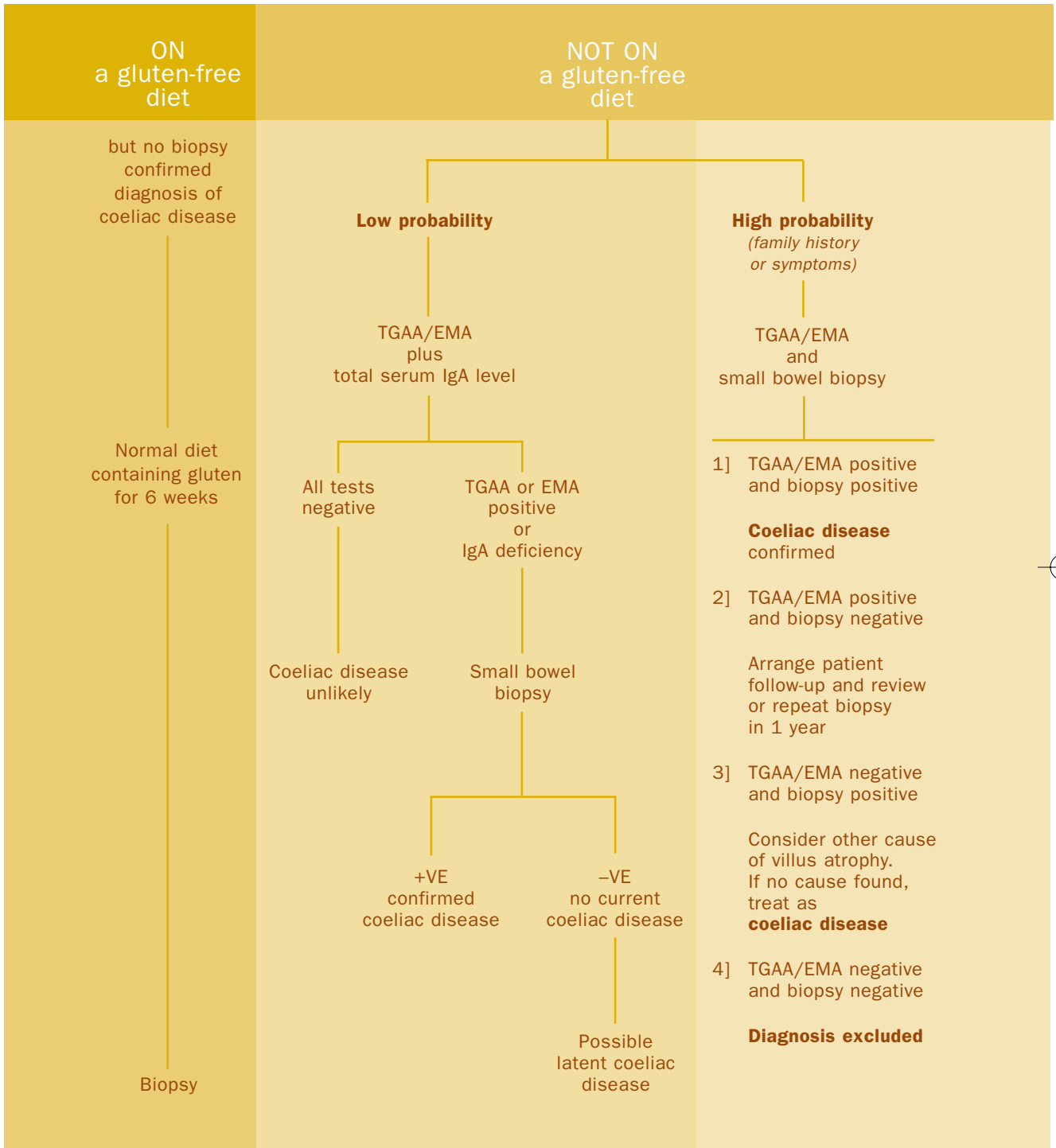
- 1] Gliadin antibodies (AGA)
- 2] Endomysial antibodies (EMA)
- 3] Tissue transglutaminase autoantibodies (TGAA)

Gliadin antibodies include IgA and IgG antibodies. These tests have moderate sensitivity but are less specific than IgA endomysial antibodies. False positive results occur in a variety of gastrointestinal conditions that lead to leaky membranes such as inflammatory bowel disease, and gastroenteritis. However, IgA anti-gliadin antibody (AGA) is the most useful marker in symptomatic children younger than 2 years of age. It is not a useful test to monitor dietary compliance.

Endomysial antibodies (EMA) are usually detected by indirect immunofluorescence. Sensitivity and specificity are high. Problems occur, however, due to the subjective variation in the interpretation of the test from one lab to another tissue. Autoantibodies to tissue transglutaminase constitute a large proportion of endomysial autoantibodies. Tissue transglutaminase autoantibody (TGAA) can be measured in a radioassay or ELISA format. Radioassay may be more quantitative than the ELISA method. TGAA levels appear to correlate reasonably with the disease severity seen on biopsy.

Remember that 2-5% of patients diagnosed with coeliac disease are IgA deficient and therefore have a negative result in the tests that measure antibodies of the IgA immunoglobulin class.

Clinical suspicion



Associations

with coeliac disease

Patients with coeliac disease have a higher than usual risk of a variety of other disorders.

These can be grouped into several distinct areas although in some the causative mechanism is not known or multiple factors may be operative—

- 1] Consequences of malabsorption
- 2] Diseases due to altered immunity
- 3] Diseases of unknown causal association
- 4] Malignant disease

Consequences of malabsorption

a] Anaemia of various types and blood clotting disorders can result from failure to absorb iron, folic acid, vitamin B12, fat-soluble vitamins.

b] Failure to thrive, muscle wasting, weight loss and short stature can result from protein and calorie malabsorption.

c] Osteoporosis or osteopenia has been reported in up to 30% of coeliac patients. The incidence is higher when the diagnosis is made in later life. However there is only a small increase in risk of bone fractures. Patients with coeliac disease diagnosed later in life

may benefit from bone density estimation and appropriate treatment of osteoporosis when present.

Osteomalacia due to Vitamin D deficiency is uncommon in Australia, but in colder climates with reduced exposure to sunlight the incidence is increased.

d] Female infertility and recurrent miscarriage is increased in coeliac disease, probably due to folate deficiency but other factors may also be involved (see under Autoimmune Diseases).

All women suffering recurrent miscarriage without obvious cause should be screened for coeliac disease. Women with coeliac disease contemplating pregnancy should ensure that folate levels are adequate.

Diseases associated with altered immunity

a] Dermatitis Herpetiformis
Most patients with Dermatitis Herpetiformis have coeliac disease and should undergo a small bowel biopsy.

b] Connective tissue disorders
There is a small but significant increase in the risk of autoimmune connective disorders such as Systemic Lupus Erythematosus, Scleroderma, Dermatomyositis and Sjogren's Syndrome.

c] Autoimmune thyroid disease

The risk appears to be at least twice that of the normal population. Coeliac screening serological tests have been suggested for all patients with autoimmune thyroid disease.

d] Addison's Disease

A recent study showed 10% of patients with Addison's Disease (failure of the adrenal gland resulting in inadequate secretion of cortisone and other natural steroids) have coeliac disease. It is very important to recognise this association because the replacement steroid therapy used in Addison's disease may make the diagnosis of coeliac disease more difficult. Conversely, the malabsorption associated with coeliac disease can result in inadequate treatment of the Addison's disease because medications are poorly absorbed. It has been recommended that coeliac serology should be undertaken in all patients with autoimmune Addison's disease.

e] IgA deficiency

Immunoglobulin A is a protein associated with intestinal immune responses. There is a greatly increased risk of IgA deficiency in patients with coeliac disease.

f] Insulin-dependent diabetes (type 1 diabetes)

Coeliac disease is present in up to 10% of individuals with insulin-dependent diabetes. In most patients the diabetes

is diagnosed before the coeliac disease. Improved control of diabetes and improvement in growth, psychological factors and intestinal symptoms have been reported in some diabetics after commencing a gluten-free diet.

g] Decreased or even totally absent splenic function

(hyposplenism) may occur in up to 50% of coeliac patients diagnosed in adult life. The incidence decreases with earlier age of diagnosis. In partial hyposplenism, splenic function may improve on a gluten-free diet. This condition is usually diagnosed on blood examination. Patients with totally absent splenic function have an increased risk of pneumococcal infection.

h] Mouth ulceration

is a frequent complaint and may have an immunological basis.

i] Infertility

Infertility and recurrent miscarriage is commonly due to folate deficiency. However, even when allowance is made for this factor there remains some increase in female infertility. There is a small but definite increase in male infertility, which appears to be related to autoimmune disease of the pituitary gland.

j] Lymphocytic and collagenous colitis

are rare colonic disorders causing chronic diarrhoea. The diagnosis can only be

made by colonic biopsy. There is a small but definite association with coeliac disease. The risk of developing ulcerative colitis is slightly increased in coeliac patients.

k] Autoimmune liver diseases including active chronic hepatitis, primary biliary cirrhosis and sclerosing cholangitis are all increased in coeliac patients. A Welsh study in a very geographically stable population showed a 3% risk of primary biliary cirrhosis.

Diseases of unknown causal association

a] Neurological disease in the form of neuropathy, spinal cord degeneration and dementia can occur as a result of vitamin B12 deficiency. There is an increased incidence of more obscure neurological diseases including epilepsy, peripheral neuropathy, cerebellar ataxia and unusual forms of dementia.

b] Down's and Turner's Syndromes

c] Irritable bowel syndrome Some studies suggest a five-fold increased risk of coeliac disease in irritable bowel syndrome. However, this is a difficult area since the diagnosis of irritable bowel syndrome is less than precise. A study which looked at coeliac patients also fulfilling the diagnostic

criteria for irritable bowel syndrome had little improvement in their overall symptoms with strict compliance to a gluten-free diet. A quality of life study showed little difference in the scores of coeliac patients on or off a gluten-free diet compared with the normal population, but showed a significant decrease for coeliac patients with irritable bowel syndrome.

Malignant disease

a] Coeliac disease is associated with an increased risk of gastrointestinal malignancy, particularly lymphoma.

b] There is also an increased risk of oropharyngeal, oesophageal and small intestinal carcinoma.

c] Hepatobiliary and colorectal cancer may also be increased.

d] Adherence to a gluten-free diet reverses the increased risk of malignancy to that of the normal population within five years.

e] Patients diagnosed during childhood do not have an increased risk of lymphoma, presumably due to the early institution of a gluten-free diet.

f] Delay in diagnosis and failure to comply with a gluten-free diet are both significantly associated with an increased risk of malignancy.

INCIDENCE OF MALIGNANCY IN COELIAC DISEASE

	<i>Relative risk</i>
All malignancies	1.3
Lymphoma	5.9
Small intestinal carcinoma	10.0
Oropharyngeal	2.3
Oesophageal	4.2
Breast	0.3
Colorectal	1.5
Hepatobiliary	2.7

Askling et al 2002 Sweden

There is a definite increased risk of malignant disease but many of the mechanisms underlying that remain unknown.

Theories which attempt to explain the increase in risk include—

- 1 Nutritional deficiencies (eg. iron deficiency and oesophageal webs)
- 2 Increased permeability to carcinogens
- 3 Malabsorption of protective agents such as vitamins
- 4 Associated disorders
- 5 Chronic inflammation with increased cell turnover.

Summary

Coeliac disease is associated with an increased incidence of malignancy, particularly lymphoma.

This increased risk is reduced or eliminated by maintaining a strict gluten-free diet.

Relapse of symptoms or failure to respond to a gluten-free diet may be due to a complicating lymphoma.

These findings emphasise the importance of early diagnosis and lifelong adherence to a strict gluten-free diet.

The treatment

of coeliac disease

Gluten-free diet

A gluten-free diet has been the main treatment for coeliac disease since the 1950's. Gluten is found in large amounts in the cereal grains wheat, rye, barley and triticale. Oats contain similar proteins, but it is at present uncertain whether these cause disease.

Nevertheless, oats produced in Australia are generally contaminated with small amounts of gluten from wheat and barley, and should probably be avoided until a reliable contaminant-free source is available. Some patients can tolerate a limited amount of oats and this should be assessed individually. Breads, cakes, biscuits, pastas and breakfast cereals are the main sources of gluten in the diet.

Gluten-free grains and flours include maize/corn, rice, soy, buckwheat, besan (chickpea), sorghum, potato, tapioca, sago and millet. Fresh milk, butter, cheese, fruits, vegetables, legumes, seeds, red meat, fish, chicken and seafood do not contain gluten. Beer will need to be excluded, but tea, coffee and wine can continue to be consumed.

Starch and other refined or processed ingredients derived from wheat, rye and barley can contain very small amounts of gluten. Examples include the thickeners 1400-1450, hydrolyzed vegetable protein, maltodextrin, malt and malt extract.

These ingredients may be present in commercial products that give the appearance of being gluten-free.

The current *Australian Food Standards* state that the grain source of the ingredient must be declared on the package label if it was derived from a gluten containing grain.

When patients are first diagnosed with coeliac disease, they should be referred to a dietitian¹ with expertise in coeliac disease for detailed advice about adoption of a gluten-free diet.² Newly diagnosed patients should also be advised to join the Coeliac Society.³

If the patient also has insulin dependent diabetes mellitus dietary management becomes more complex.⁴ In general, commercial gluten-free foods have a higher glycaemic index than their wheat containing counterparts. Blood sugar levels will need to be monitored for the first few months after commencing a gluten-free diet and adjustments made to the insulin dose.

Any medications, vitamin and mineral supplements, enteral feeds or other oral supplements can also be potential sources of small amounts of gluten. Their ingredients should always be checked before prescribing for patients with coeliac disease.

Future options

Identification of a multiple amino acid peptide in foods toxic to coeliac patients might be found in wheat, barley and rye, but not “safe” foods such as oats, rice and maize. Digestion of this peptide with a bacterial propyl endopeptidase may mitigate its T-cell stimulatory response. This may lead to more accurate detection of foods that are unsafe for coeliac patients and may lead to new strategies of detoxifying gluten. This may be either by proteolytic digestion or through elimination of this epitope by genetic engineering. In the future, the benefits of gluten-free diet may become more palatable for patients.

Persisting diarrhoea

in coeliac patients after commencing a gluten-free diet

Causes include—

Persisting gluten intake

Review by dietitian is mandatory

Resistant coeliac disease

(about 2% will require steroids to initiate dietary response)

Related disorders

eg. collagenous colitis, irritable bowel syndrome and lymphoma

Wheat intolerance which is not due to coeliac disease

In some patients wheat products can cause bloating, nausea and abdominal discomfort. This is due to fermentation in the colon with production of gas and colonic distension.

It is essential to clarify diagnosis before undertaking trials of wheat or gluten-free diets.

Coeliac disease requires a strict life-long adherence to a gluten-free diet. Those with a normal small bowel biopsy, but symptoms on a wheat containing diet require only avoidance of this food to control these adverse symptoms. Small bowel biopsies and serological tests while on a wheat or gluten-free diet may be normal in coeliac patients.

Wheat and gluten-free diet trials undertaken before a small bowel biopsy give results that are unable to be correctly interpreted and lead to confusion and misdiagnosis.

Adverse food reactions

Coeliac disease is one of a large range of diverse reactions which can occur with foods.

The 3 main classes of adverse reactions are—

- 1] **T-Cell mediated reactions**
coeliac disease
- 2] **IgE mediated reaction**
food allergies
- 3] **Non-immunological reactions**
food intolerance

Food Allergy	vs	Food Intolerance
Mostly children		All ages
IgE mediated		Non-immunological
Few foods		Many foods
Immediate		Delayed
Reproducible		Variable reactions
Diagnosis straightforward		Diagnosis often obscure

Food allergy

Food allergy is quite different from intolerance to food chemicals. It is caused by antibodies to food proteins, and usually involves only one or two foods.

It affects mainly infants and children with a family background of allergic disorders like asthma, hay fever and eczema. Milk, eggs or wheat are the foods most likely to be a problem but fortunately most children tend to grow out of these allergies by the age of four or five. Allergies to peanuts or fish are less

common, but can be very severe and may last for life. If reactions occur from other foods they are likely to be due to chemical intolerances.

Severe allergies to foods are usually obvious. Contact with the mouth can cause itching and swelling within minutes, followed by vomiting, cramps and diarrhoea. Milder allergies to foods eaten regularly can aggravate chronic eczema and may be harder to identify. Highly sensitive children can be unlucky enough to have both a food allergy and chemical intolerances.

Don't be misled: allergy tests are of no use for picking up intolerances. Even in allergic children they are of limited value, since they're often positive even when the food causes no symptoms at all. Other tests like the 'cytotoxic' test, or taking the pulse after eating certain foods are completely unreliable.

Asthma is a special problem because it can be dangerous. Foods don't cause asthma. However, attacks of wheezing can sometimes be triggered by sulphite preservatives, and less commonly by foods rich in natural salicylates or MSG. Rarely, a severe food allergy can also trigger attacks.

Food intolerance

Some susceptible people have adverse reactions known as 'food intolerances' to certain natural food substances (other than gluten) and some food additives.

About 5-10% of the population appear to be affected, at least to some degree. In some cases, the symptoms are minor and transient, and require only avoidance of any foods that cause obvious reactions. However, in some very sensitive people, symptoms can be recurrent and troublesome and require a more extensive change of diet.

Non-gluten food intolerances are different from coeliac disease. They do not involve immune reactions to food proteins and do not cause any damage to the bowel lining. They are caused by the chemical components of certain foods, probably acting through irritation of nerve endings in different parts of the body. As with reactions to medications or drugs, people react to different degrees and to different substances.

The most commonly recognised natural food chemicals to which people may be intolerant are salicylates, amines, glutamate (MSG) and lactose. Additives such as preservatives, antioxidants and

colourings are also often involved. The adverse effects of these substances are dose-related and depend on the amount and frequency with which they are consumed in the daily diet, and on the individual's degree of sensitivity (or reaction 'threshold').

Symptoms vary from person to person, with abdominal discomfort or pain, recurrent hives and headaches being the most common. Sometimes there is a feeling of being generally unwell, run-down or irritable.

HIGH THRESHOLD

LOW THRESHOLD

PEOPLE VARY IN THEIR DEGREE OF SENSITIVITY TO THE CHEMICALS WHICH OCCUR NATURALLY IN FOODS. THE THRESHOLD OF TOLERANCE IS THE POINT AT WHICH A REACTION BECOMES PERCEPTIBLE. A PERSON WITH A HIGH THRESHOLD WILL REACT ONLY OCCASIONALLY TO A GIVEN INTAKE OF CHEMICALS WHEREAS A PERSON WITH A LOW THRESHOLD WILL BE AFFECTED MORE OFTEN BY THE SAME INTAKE.

CHOCOLATE

THRESHOLD

TOMATO ORANGE

CHEESE

BANANA

CHEESE

THE SMALL AMOUNTS OF NATURAL CHEMICALS PRESENT IN A PARTICULAR FOOD MAY NOT BE ENOUGH TO CAUSE A REACTION IMMEDIATELY. HOWEVER, BECAUSE ONE SUBSTANCE MAY BE COMMON TO MANY DIFFERENT FOODS, IT CAN ACCUMULATE IN THE BODY, CAUSING A REACTION WHEN THE THRESHOLD IS FINALLY EXCEEDED. ON THE GRAPH ABOVE ALL THE FOODS SHOWN CONTAIN NATURAL AMINES. ALTHOUGH THE LAST FOOD EATEN (CHOCOLATE) IS OFTEN BLAMED, ALL THE OTHERS HAVE CONTRIBUTED AS WELL.

People with coeliac disease are probably no more likely than anyone else to suffer from food intolerances. However, occasionally the two problems occur together by chance, and when food intolerances cause stomach or bowel symptoms, they are easily confused with those of coeliac disease.

If non-gluten food intolerances are suspected, a doctor will make sure some other cause of persistent symptoms hasn't been overlooked.

No blood or skin test will give a reliable diagnosis, but a dietitian can systematically investigate the diet.

This is done in two stages:

- 1] a strict 'elimination diet' for a few weeks, to see whether symptoms disappear.
- 2] a series of 'challenge tests' by mouth to find out which chemicals in the diet cause reactions.

Once particular problem substances have been pinpointed, a dietitian can design a tailor made diet to help prevent symptom recurrences and provide adequate nutrients.

If non-gluten food intolerances and coeliac disease co-exist, you may need to cut back on some other foods to stay well. Many people who have become used to a gluten-free diet do not find this a major problem.

Because intolerances to food chemicals are not immune reactions and do not cause any bowel damage, strict avoidance is not essential. Those with food intolerances are usually encouraged to try and gradually increase their intake of problem foods, starting with very small amounts. This can help build up some resistance which may lead to the reaction 'threshold' increasing. After a few months, many are able to tolerate a greater variety of foods without recurrence of symptoms.

For any non-gluten food intolerances, the individual can therefore safely decide how strict the diet needs to be.

It's a matter of balancing the severity of symptoms against the inconvenience of dietary restrictions.

¹ Information about locating an Accredited Practising Dietitian can be obtained on 1800 812 942.

² A booklet (*Coeliac Disease: Enjoy Life Gluten-free*) giving detailed information on the gluten-free diet is available from the RPAH Allergy Unit (allergy@email.cs.nsw.gov.au).

³ Contact details can be obtained from the National Office (02 9411 4100).

⁴ A booklet called *Living with Diabetes & Coeliac Disease* is available from any Coeliac Society or Diabetes Australia (DA) office (National Office for DA: 02 6230 1155).

Further information about food intolerances and food allergy

Talk to a doctor. Dietary investigations for food intolerance and will be able to help you. Alternatively, a doctor may refer you to an appropriate specialist or clinic.

Detailed literature and instruction booklets can be obtained by writing to—

The Allergy Unit

Department of Clinical Immunology
Royal Prince Alfred Hospital (RPAH),
Missenden Road
Camperdown NSW 2050
e-mail: allergy@immu.rpa.cs.nsw.gov.au
or fax: 02 9519 8420

These materials should be used in conjunction with advice from a doctor or dietitian.

Information about the chemical composition of these foods, along with recipes and useful hints for shopping and food preparation, can also be found in *Friendly Food* (Murdoch Books).

about coeliac disease

State Coeliac Societies have available—
The Coeliac Society of Australia Inc.
Ingredient List (“Blue Book”)

The Handbook of the Australian
Coeliac Society Inc.

Video: *Understanding Coeliac Disease*
(30 minute duration)

Amy can't eat gluten
Judy Young
(Reading and activity book designed
to help young children understand
their disease)

The Australian Coeliac
(Magazine of the Coeliac Society
of Australia Inc.)

Enjoy eating without gluten
Santarium Nutrition Education Service
(0243) 4877 777

Living with Diabetes and Coeliac Disease
Contact an local branch of Diabetes
Australia or the State Coeliac Society

Recipes

Gluten-free Recipes
Dairy Foods Advisory Bureau
PO Box 467
Port Melbourne Vic 3207
(no postage is necessary to receive
these recipes)

*Wheat Free World: Wheat Free/GlutenFree
Cookery* Lola Workman
Wheat Free World
PO Box 547
Dee Why NSW 2099
Fax: (02) 9971 7193

The Australian Coeliac

Magazine of The Coeliac Society
of Australia Inc.
Recipes appear in each quarterly issue

A Wealth of Health: Gluten-Free Cookbook

Sue Shepherd, Dietitian
Shepherd Works
PO Box 809 Boronia Vic 3155

Friendly Food

Anne Swain, Velencia Soutter
& Robert Loblay
Royal Prince Alfred Hospital Allergy Unit
Predominantly low food chemical,
gluten-free recipes
(02) 9515 8244

Wheat Free Cooking

Ruby M Brown
Sally Milner Publishing, Sydney

Fantastic Cakes

The Australian Women's Weekly
Cookbooks
ACP Publishing Pty Ltd. 1998

NOTE: *The Women's Weekly children's birthday cake character theme book contains a recipe for a gluten-free sponge cake. Although the Gluten-free Misti Cat cake shown does use the gluten-free sponge cake recipe, the decorations shown on the cake are not gluten-free.*

The cake is iced in yoghurt, which may contain a thickener.

They also decorated the cat with liquorice, which contains flour. Use the gluten-free sponge recipe for any of the cakes, but remember to use pure icing sugar rather than icing mixture.

Check that your decorations are gluten-free.

The Coeliac Society of Australia Inc.

www.coeliac.org.au

The State and territory Coeliac Societies are community-based registered charities, established to provide information and support for people with coeliac disease, dermatitis herpetiformis and any others with a medical requirement for a gluten-free diet. The Coeliac Society of Australia Inc. was formed in 1980 to provide a forum to promote the objectives of the state and territory Coeliac Societies throughout Australia.

Advice and information is provided on the gluten-free diet; ingredients and additives; where to buy food; recipes and cooking; eating out; overseas travel; educational material; and research news. State and Territory Societies organise local meetings, seminars, information sessions, cooking demonstrations, dinners, picnics and other social functions where members can meet and exchange ideas and information.

A quarterly magazine, *The Australian Coeliac*, is published by The Coeliac Society of Australia Inc. It provides updated information on many of the above topics, as well as notices of forthcoming events, and personal profiles of members.

