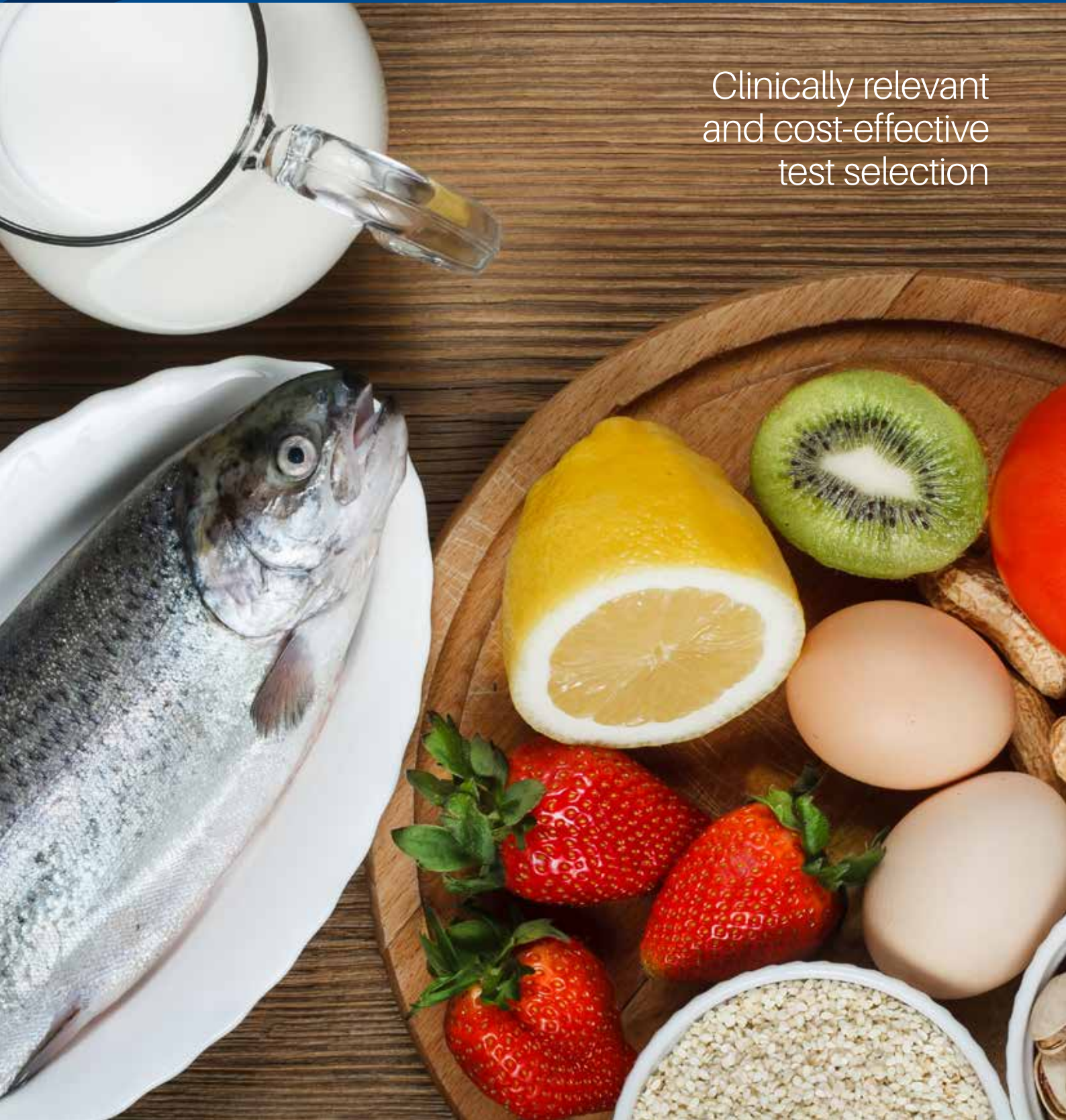




DOUGLASS
HANLY MOIR
PATHOLOGY
Quality is in our DNA

Laboratory diagnosis of allergy

Clinically relevant
and cost-effective
test selection



Allergic disorders result from an inappropriate, usually IgE-mediated, immune response upon exposure to environmental, food, insect or medication allergens. Common clinical manifestations of allergy include rhinoconjunctivitis, asthma, eczema, acute urticaria and anaphylaxis. Disorders, such as chronic urticaria, hereditary angioedema and T-cell contact dermatitis, while clinically similar to allergy in some ways, are not IgE-mediated.

Testing for allergy

Most tests for allergy are laboratory tests for allergic sensitisation or the presence of allergen-specific IgE. An individual who experiences symptoms when exposed to an allergen will usually have measurable IgE which specifically recognises that allergen. Testing allergen-specific IgE has fundamental importance for the diagnosis of allergic disorders.

Skin testing is the *in vivo* equivalent to allergen-specific IgE testing and has advantages, such as providing immediate results and being less expensive. However, it carries the risk of allergic reaction (including anaphylaxis), and results may be affected by antihistamines, dermographism and a narrower range of allergens being available, when compared to laboratory tests.

Regardless of the method used, the demonstration of sensitisation is not sufficient to diagnose allergy. Some sensitised individuals remain symptom-free after exposure and others, who react to an allergen, may not have any detectable allergen-specific IgE in their blood. Therefore, the results of allergy testing must be interpreted in the context of the patient's clinical history; an allergy diagnosis cannot be made solely on the results of laboratory or skin testing.

Types of laboratory tests for allergy

Total IgE

Patients with allergic conditions, such as asthma, allergic rhinitis or atopic dermatitis, often have higher serum levels of IgE than the general population. While an elevated total IgE may indicate that the patient is atopic, it provides no information relating to a specific condition or to what allergens the patient may be sensitive. There is also a significant overlap in total IgE levels between those with and without allergic disease. For these reasons, the utility of total IgE measurement is limited.

However, there are specific clinical situations in which total IgE is helpful. These include allergic bronchopulmonary aspergillosis, parasitic infections, the monitoring of immunosuppressant or biological therapies for eczema and a few rare immune disorders and malignancies. It is also used to assess the likely benefit of anti-IgE therapy in patients with moderate-to-severe asthma.

The specific IgE index (the ratio of allergen-specific IgE to total IgE) is another measure that can inform clinicians about potential severity and risk of a specific allergen sensitisation.

Allergen-specific IgE

Allergen-specific IgE detection (often referred to as RAST, a specific methodology which has been superseded) is most commonly performed by enzyme immunoassay and is a measure of Type 1, IgE-mediated immediate hypersensitivity. Specific IgE binds to allergen in direct proportion to serum concentration and can therefore be reported quantitatively.

The presence of allergen-specific IgE indicates that the patient is sensitised to that allergen and may react upon exposure. The likelihood of clinical reactivity is influenced by the degree of positivity, the allergen in question and the patient's clinical history.

Douglass Hanly Moir Pathology offers allergen-specific IgE testing using the international benchmark Thermo Fisher Phadia ImmunoCAP systems. We maintain the most extensive reference allergen menu in Australasia and receive referrals from both public and private laboratories and directly from clinicians. We offer standard inhalant, food and venom allergens, as well as purified allergen molecules (components) as individual assays. In addition, the Phadia ISAC microarray is used to profile specific IgE antibodies to a wide range of clinically important individual allergens or allergen components.

Other allergic inflammatory mediators

Tryptase

Elevated mast cell tryptase in peripheral blood indicates systemic mast cell degranulation (occurring, for example, as an adverse reaction to a stinging insect or to a diagnostic or therapeutic agent) or increased numbers of mast cells, which can occur in patients with mastocytosis. In such clinical settings, the test is Medicare rebatable. Tryptase is not elevated in persons with anaphylaxis from foods or non-parenteral agents.

Eosinophil cationic protein (ECP)

ECP is elevated in persons with active eosinophilic inflammation and is a useful marker in the diagnosis and management of hypereosinophilic disorders. It is also a useful marker of allergic airways inflammation in young children and in following some persons with eosinophilic oesophagitis.

At present, the test is only reimbursed by Medicare when requested in children under 12 years of age for assessment of airways inflammation (please write 'asthma' on clinical notes). For all other requests, the fee is \$50, non-rebatable.

Non-allergic angioedema

Type I & II (C1 esterase inhibitor) hereditary angioedema

This should be considered in anyone with a family history of angioedema without urticaria. Relevant investigations include C1 esterase level and function, C3 and C4 which should be measured at the same time.

Abnormal levels occur in persons with deficiency which has autosomal dominant inheritance. Persons with this disorder usually experience symptoms from puberty onwards and may have life-threatening episodes which are not responsive to adrenaline. Many patients also experience recurrent abdominal pain due to visceral angioedema. Functional deficiency may occur on a genetic basis or, in older persons, it can result from an interfering autoantibody associated with lymphoma. Abnormal functional assay results should always be repeated.

These assays are performed on serum and reimbursed by Medicare. Sequencing for the detection of mutations causing Type I and II hereditary angioedema is performed by the laboratory and the fee is \$418, non-rebatable.



Billing for allergy testing

Medicare rebates for allergen-specific IgE testing (i.e. RAST) provide for a maximum of four single allergens per pathology request and a maximum of four test-episodes per year. A comprehensive assessment of an individual's allergic status typically requires more extensive investigation than this Medicare-funded minimum.

Our policy is to respect the request of the referring clinician and to test all allergens specified. If no more than four single allergens are specified, and we are requested to bulk-bill the patient, there will be no cost to the patient.

However, if more than four single allergens are specified, we will bill the patient directly, according to the pricing in this menu*. We cannot accept requests to bulk-bill episodes which involve testing of more than four single allergens, more than two mixed allergens or more than two single allergens and one mixed allergen. The patient will be invoiced for the number of allergens tested PLUS a test fee of \$25, and may be eligible for a Medicare rebate of \$22.95. Patients may be able to claim a rebate on four occasions per year for testing performed on separately collected blood, with each episode at least 14 days apart.

*Prices throughout this brochure are correct at time of printing

Ordering allergy tests

The Medicare rebate available for the investigation of allergy is usually insufficient to cover the cost of allergy testing which makes judicious test selection imperative. Historically, laboratory test panels included mixed allergens that could be used as a negative screen to provide more allergen test coverage within a Medicare rebate. However, non-specific reactivity is common in mixed allergen testing and strategies based on mixed allergen screening, followed by individual characterisation, are clinically inefficient and can be misleading.

When investigating a potentially allergic patient, the object is to obtain maximum utility while minimising out-of-pocket costs. Douglass Hanly Moir Pathology has assembled eight allergen profiles which may assist in this process, but we emphasise the need for modification based on clinical context.

CERTAIN profiles (Clinically Effective Rational Testing Allergy INformation)

The CERTAIN profiles are designed to provide efficient baseline allergy assessment for most of the circumstances encountered in clinical practice. The composition of each profile is given below and each can be requested as CERTAIN profile (or CP) 1,2,3 etc. Additional allergens can be added, if necessary, (sera are kept for four weeks from the date of collection) but when more than four allergens are tested, a fee will be charged (\$5 per individual, \$10 per mixed allergen and \$40 per component allergen). Current Medicare Benefits Schedule (85%) rebates for total IgE (Item 71075) are \$19.55 and \$22.80 for an episode of *in vitro* specific IgE allergen testing (Item 71079).

CP	TOTAL IgE & SPECIFIC IgE	CLINICAL APPLICATIONS	PRICE
CP1	Egg white, egg yolk, cow's milk, ovomucoid alpha lactalbumin, beta lactoglobulin, wheat, soy, oats, potato, peanut, cashew nut, sesame seed, almond, codfish, beef, chicken, kiwifruit, banana, avocado, latex, strawberry	21 allergens, designed for allergic children in the first 18 months	\$110
CP2	Egg white, egg yolk, cow's milk, ovomucoid alpha lactalbumin, beta lactoglobulin, wheat, soy, oats, potato, peanut, cashew nut, hazelnut, walnut, macadamia nut, sesame seed, almond, codfish, beef, chicken, prawn, kiwifruit, banana, avocado, latex, strawberry, dust mite, cat, dog, fescue grass	30 allergens, designed for allergic children between 19 and 36 months	\$155
CP3	Peanut, cashew nut, pistachio, walnut, hazelnut, almond, brazil nut, pecan nut, macadamia nut, pine nut, sesame seed, pumpkin seed, linseed, coconut	14 allergens, designed for children, teenagers and adults with uncertainty about 'nut allergy' and follow-up after previous positive tests or reactions	\$75
CP4	Codfish, tuna, salmon, crab, prawn, lobster, oyster, mussel, scallop, octopus, squid, anisakis	12 allergens, designed for children, teenagers and adults with uncertainty about fish and seafood or follow-up of previously seafood-sensitised persons	\$65
CP5	Alpha-gal, cow's milk, pork, beef, lamb	4 allergens and one component allergen, designed for tick-meat-milk-sensitised persons initially or in follow-up	\$65
CP6	Birch, parietaria, latex, apple, peach, apricot, plum, kiwifruit, banana, avocado, hazelnut	11 allergens, designed for persons with birch pollen-induced food allergy or oral allergy symptoms, usually following time in New Zealand, Europe or North America and sometimes Canberra or Melbourne	\$60
CP7	Rockmelon, watermelon, eggplant, cucumber	4 allergens, designed for persons with reactions to melons	\$22.80
CP8	Down-feathers, dust mite, fescue grass, bahia (paspalum) grass, couch (bermuda) grass, rye grass, cat, dog, horse, birch pollen, olive tree pollen, acacia, eucalyptus, cypress, casuarina, plane tree, privet, plantain, ragweed, alternaria, aspergillus, penicillium, horradendrum	22 allergens and one mixed allergen, designed for persons over age four with significant aeroallergen symptoms, including allergic rhinitis, allergic conjunctivitis and asthma	\$1,150

Initial investigation panels

If you write 'RAST' or 'Allergy serology', but do not specify the allergens, we will perform the tests listed under A1 (for a child 6 years or less) or A2 (adult, or child over 6 years). Any subsequently requested additional allergens are charged according to the billing policy listed in this brochure.

For panels A1 and A2 we will accept the Medicare rebate.

A1: CHILD 6 years or less

Total IgE

F2	Cow's milk
D1	Dust mite
F1	Egg white
F13	Peanut
F14	Soy

A2: ADULT, or CHILD over 6 years

Total IgE

M6	Alternaria
E1	Cat dander
E5	Dog dander
D1	Dust mite
G4	Grass pollen (fescue)

Other common initial investigation panels

One (1) of these panels is within our allowance under Medicare

Please write the name and code of the panel on the request form.

A4 ANIMAL INHALANTS	A5 RURAL INHALANTS	A6 PETS	A7 MOULDS
E1 Cat dander	M6 Alternaria	E1 Cat dander	M6 Alternaria
E5 Dog dander	G17 Bahia grass	E5 Dog dander	M3 Aspergillus
D1 Dust mite	WX1 Weed mix	E6 Guinea pig	M5 <i>Candida albicans</i>
G4 Grass pollen (fescue)		E82 Rabbit	M2 Cladosporium
A8 NATIVE TREES	A9 FOOD SCREEN	A10 NUTS	A11 SEAFOOD
T19 Acacia	F23 Crab	F20 Almond	F3 Codfish
T73 Australian pine	FX1 Nut mix	F17 Hazelnut	F23 Crab
T18 Eucalyptus	F4 Wheat	F13 Peanut	F24 Prawn
T21 Melaleuca		F201 Pecan nut	F80 Lobster
A12 CEREALS	A13 STAPLE FOODS	A14 INSECTS	A15 LATEX & FOODS
F6 Barley	F1 Egg white	I1 Honey bee venom	F92 Banana
F9 Rice	F2 Cow's milk	I71 Mosquito	F84 Kiwifruit
F14 Soybean	F13 Peanut	I4 Paper wasp venom	K82 Latex
F4 Wheat	F14 Soybean	I3 Yellow jacket	F87 Melon
A16 FOOD & INHALANTS			
M6 Alternaria	D1 Dust mite	G4 Grass pollen (fescue)	FX5 Staple food mix

A3 child allergy assessment panel (Request 'IgE and RAST A3')

This panel is designed for the assessment of children at high risk of allergic disease, especially those with eczema, possible food and inhalant allergies. The cost of this panel is \$160, for which a Medicare rebate of \$22.95 may be available.

A3 CHILD			
M6 <i>Alternaria alternata</i>	D1 Dust mite	K82 Latex	F35 Potato
F92 Banana	F1 Egg white	M227 <i>Malassezia spp.</i>	E82 Rabbit epithelium
G2 Bermuda grass	F75 Egg yolk	F91 Mango	F10 Sesame seed
F202 Cashew nut	G4 Grass pollen (fescue)	F2 Cow's milk	F14 Soybean
E1 Cat dander	F17 Hazelnut	W21 <i>Parietaria judaica</i>	M80 Staph. enterotoxin A
F3 Codfish	E3 Horse dander	F13 Peanut	F4 Wheat
E5 Dog dander	F84 Kiwifruit	G5 Perennial rye grass	

Extended allergen panel examples

Our charge for each of these panels is \$125, for which a rebate of \$22.95 may be available per episode. Each allergen may also be ordered separately by its code or name. Other personalised extended panels are available on request.

Please contact our Clinical Immunologists on (02) 9855 5312 to discuss your requirements.

A20 INHALANTS	A21 MOULD & STORAGE MITES	A22 FOODS	A23 ANAPHYLACTIC FOODS
T19 Acacia	D70 <i>Acarus siro</i>	F20 Almond	F20 Almond
M6 <i>Alternaria alternata</i>	M6 <i>Alternaria alternata</i>	F92 Banana	F92 Banana
M3 <i>Aspergillus fumigatus</i>	M3 <i>Aspergillus fumigatus</i>	F6 Barley	F27 Beef
T73 Australian pine	D201 <i>Blomia tropicalis</i>	F27 Beef	F18 Brazil nut
G2 Bermuda grass	M5 <i>Candida albicans</i>	F3 Codfish	F36 Coconut
D201 <i>Blomia tropicalis</i>	M2 <i>Cladosporium herbarum</i>	F1 Egg white	F3 Codfish
E1 Cat dander	D1 <i>D. pteronyssinus</i>	F17 Hazelnut	F23 Crab
M2 <i>Cladosporium herbarum</i>	M14 <i>Epicoccum purpurascens</i>	F84 Kiwifruit	F17 Hazelnut
W1 Common ragweed	D74 <i>Euroglyphus maynei</i>	F91 Mango	F84 Kiwifruit
E5 Dog dander	M9 <i>Fusarium moniliforme</i>	F2 Cow's milk	K82 Latex
D1 Dust mite	D73 <i>Glycyphagus domesticus</i>	F33 Orange	F80 Lobster
W9 English plantain	M8 <i>Helminthosporium</i>	F13 Peanut	F91 Mango
T18 Eucalyptus	D71 <i>Lepidoglyphus destructor</i>	F35 Potato	F290 Oyster
G4 Grass pollen (fescue)	M227 <i>Malassezia spp.</i>	F9 Rice	F13 Peanut
E3 Horse dander	M4 <i>Mucor racemosus</i>	F5 Rye	F201 Pecan nut
W10 Lamb's quarters	M1 <i>Penicillium notatum</i>	F10 Sesame seed	F24 Prawn
T21 Melaleuca	M13 <i>Phoma betae</i>	F14 Soybean	F41 Salmon
W21 <i>Parietaria judaica</i>	M10 <i>Stemphylium botryosum</i>	F44 Strawberry	F10 Sesame seed
G5 Perennial rye grass	M15 <i>Trichoderma viride</i>	F4 Wheat	F40 Tuna
E82 Rabbit epithelium	D72 <i>Tyrophagus putrescentiae</i>	F45 Yeast	F256 Walnut

Single allergens

\$5 for each allergen

Note: Requests for more than four of these will exceed our allowance under Medicare

Allergens

ANIMAL & AVIAN PROTEINS

Budgerigar droppings	E77
Budgerigar feathers	E78
Canary bird feathers	E201
Cat dander	E1
Chicken droppings	E218
Chicken feathers	E85
Chicken serum proteins	E219
Cow dander	E4
Dog dander	E5
Duck feathers	E86
Finch feathers	E214
Goat epithelium	E80
Goose feathers	E70
Guinea pig epithelium	E6
Horse dander	E3
Mouse epithelium	E71
Mouse serum proteins	E76
Mouse urine proteins	E72
Parakeet droppings	E197
Parakeet feathers	E196
Parrot feathers	E213
Pigeon droppings	E7
Pigeon feathers	E215
Rabbit epithelium	E82
Rabbit serum proteins	E206
Rabbit urine proteins	E211
Rat epithelium	E73
Rat serum proteins	E75
Rat urine proteins	E74
Sheep epithelium	E81
Swine epithelium	E83
Swine serum albumin	E222
Turkey feathers	E89

DRUGS

Amoxicilloyl	C6
Ampicilloyl	C5
Cefaclor	C7
Chlorhexidine	C8
Chymopapain	C209
Gelatin bovine	C74
Insulin human	C73
Morphine	C260
Penicilloyl G	C1
Penicilloyl V	C2
Pholcodine	C261
Suxamethonium (Succinylcholine)	C202
Tetanus toxoid	C208

GRASS & GRAIN POLLENS

Bahia grass	G17
Barley grain	G201
Bermuda grass	G2
Brome grass	G11
Cultivated oat	G14
Cultivated wheat	G15
Grass pollen (fescue)	G4
Johnson grass	G10
Meadow grass	G8
Rye grass	G5
Sweet vernal grass	G1
Timothy grass	G6
Velvet grass	G13

INSECTS

Cockroach - American	I206
Cockroach - Oriental	I207
Horse fly	I204
Moth	I8
Berlin beetle	I76
Bloodworm	I73
Cockroach (<i>Blattella germanica</i>)	I6
Fire ant (<i>Solenopsis invicta</i>)	I70
Grain weevil (<i>Sitophilus granarius</i>)	I202
Green nimitti (<i>Cladotanytarsus</i>)	I72
Mediterranean flour moth	I203
Mosquito spp. (<i>Aedes communis</i>)	I71

MOULDS, YEASTS & TOXINS

<i>Alternaria alternata</i>	M6
<i>Aspergillus flavus</i>	M228
<i>Aspergillus fumigatus</i>	M3
<i>Aspergillus niger</i>	M207
<i>Aspergillus terreus</i>	M36
<i>Aureobasidium pullulans</i>	M12
<i>Botrytis cinerea</i>	M7
<i>Candida albicans</i>	M5
<i>Cephalosporium acremonium</i>	M202
<i>Chaetomium globosum</i>	M208
<i>Cladosporium herbarum</i>	M2
<i>Curvularia lunata</i>	M16
<i>Epicoccum purpurascens</i>	M14
<i>Fusarium moniliforme</i>	M9
<i>Helminthosporium halodes</i>	M8
<i>Malassezia spp.</i>	M227
<i>Mucor racemosus</i>	M4
<i>Penicillium glabrum</i>	M209
<i>Penicillium notatum</i>	M1
<i>Phoma betae</i>	M13
<i>Rhizopus nigricans</i>	M11
Staphylococcus enterotoxin A	M80
<i>Stemphylium botryosum</i>	M10

MOULDS, YEASTS & TOXINS

<i>Tilletia tritici</i>	M201
<i>Trichoderma viride</i>	M15
<i>Trichophyton ment. var. interdigitale</i>	M211
<i>Trichophyton rubrum</i>	M205
<i>Trichosporon pullulans</i>	M203
<i>Ulocladium chartarum</i>	M204

MITES (HOUSE DUST & STORAGE)

<i>Acarus siro</i>	D70
<i>Blomia tropicalis</i>	D201
<i>Dermatophagoides farinae</i>	D2
<i>Dermatophagoides microceras</i>	D3
<i>Dermatophagoides pteronyssinus</i>	D1
<i>Euroglyphus maynei</i>	D74
<i>Glycyphagus domesticus</i>	D73
House dust	H2
<i>Lepidoglyphus destructor</i>	D71
<i>Tyrophagus putrescentiae</i>	D72

MISCELLANEOUS

Cotton crude fibres	O1
Seminal fluid	O70
Tetramin fish feed	O203
Tobacco leaf	O201

OCCUPATIONALS

Castor bean	K71
Chloramin T	K85
Ethylene oxide	K78
Formaldehyde/formalin	K80
Green coffee bean	K70
Isocyanate HDI	K77
Isocyanate MDI	K76
Isocyanate TDI	K75
Ispaghula	K72
Latex	K82
Silk	K74
Silk waste	K73
Sunflower seed	K84
Trimellitic anhydride TMA	K86

PARASITES

Anisakis	P4
Ascaris	P1

TREE POLLENS

Acacia	T19
American beech	T5
Australian pine	T73
Birch	T3

TREE POLLENS

Box elder	T1
Chestnut	T206
Cottonwood	T14
Cypress	T222
Date	T214
Elm	T8
Eucalyptus	T18
Grey alder	T2
Italian cypress	T23
Japanese cedar	T17
Melaleuca	T21
Mountain juniper	T6
Oak	T7
Oil palm	T223
Olive	T9
Peppertree	T217
Pine	T213
Privet pollen	T210
Red cedar	T57
Sweet gum	T211
Sycamore, London plane	T11
White ash	T15
White pine	T16
Willow	T12

VENOMS

European paper wasp (<i>Polistes dominulus</i>)	I77
European hornet (<i>Vespa crabro</i>)	I75
Honey bee (<i>Apis mellifera</i>)	I1
Paper wasp (<i>Polistes spp.</i>)	I4
White-faced hornet (<i>Dolichovespula maculata</i>)	I2
Yellow hornet (<i>Dolichovespula arenaria</i>)	I5
Yellow jacket (<i>Vespula spp. common wasp</i>)	I3

WEED & CROP POLLENS

Canola (rapeseed)	W203
Careless weed	W82
Common pigweed	W14
Common ragweed	W1
Dandelion	W8
English plantain	W9
False ragweed	W4
Goosefoot lamb's quarters	W10
Lupin	W207
Mugwort	W6
Ox-eye daisy	W7
<i>Parietaria judaica</i>	W21
Rough marshelder	W16
Saltwort	W11
Sheep sorrel	W18
Sunflower	W204
Western ragweed	W2
Wormwood	W5

Single allergens

\$5 for each allergen

Note: Requests for more than four of these will exceed our allowance under Medicare

Food allergens

FRUIT & VEGETABLES

Apple	F49
Apricot	F237
Asparagus	F261
Aubergine (eggplant)	F262
Avocado	F96
Bamboo shoot	F51
Banana	F92
Beetroot	F319
Blackberry	F211
Blueberry	F288
Broccoli	F260
Brussels sprouts	F217
Cabbage	F216
Carrot	F31
Cauliflower	F291
Celery	F85
Cherry	F242
Cucumber	F244
Date	F289
Fennel (fresh)	F276
Fig	F328
Garlic	F47
Grape	F259
Grapefruit	F209
Guava	F292
Kiwifruit	F84
Lemon	F208
Lettuce	F215
Lime	F306
Lychee	F348
Mandarin	F302
Mango	F91
Olive - black (fresh)	F342
Onion	F48
Orange	F33
Papaya	F293
Passionfruit	F294
Peach	F95
Pear	F94
Persimmon	F301
Pineapple	F210
Plum	F255
Potato	F35
Pumpkin	F225
Raspberry	F343
Red currant	F322
Rockmelon	F87
Rose hip	F330
Spinach	F214
Strawberry	F44
Sweet potato	F54
Tomato	F25
Watermelon	F329

MEAT

Chicken meat	F83
Beef	F27
Mutton	F88
Pork	F26
Rabbit meat	F213
Turkey meat	F284

POULTRY

Chicken meat	F83
Egg white	F1
Egg yolk	F75
Turkey meat	F284

SEED, LEGUMES & NUTS

Almond	F20
Barley	F6
Beans - green	F315
Beans - lima	F182
Beans - red kidney	F287
Beans - soy	F14
Beans - white	F15
Brazil nut	F18
Buckwheat	F11
Canola	F316
Cashew nut	F202
Chickpea	F309
Coconut	F36
Common millet	F55
Corn	F8
Fenugreek	F305
Gluten	F79
Hazelnut	F17
Japanese millet	F57
Lentil	F235
Linseed	F333
Lupin	F335
Macadamia nut	F345
Oat	F7
Pea	F12
Peanut	F13
Pecan nut	F201
Pine nut (pignoles)	F253
Pistachio	F203
Poppy seed	F224
Pumpkin seed	F226
Quinoa	F347
Rice	F9
Rye	F5
Sesame seed	F10
Spelt wheat	F124
Sweet chestnut	F299
Walnut	F256
Wheat	F4

SPICES

Anise	F271
Basil	F269
Bay leaf	F278
Black pepper	F280
Caraway	F265
Cardamon	F267
Chili pepper	F279
Cinnamon	F220
Coriander	F317
Curry (Santa Maria)	F281
Fennel seed	F219
Ginger	F270
Green pepper (unripe seed)	F263
Mint	F332
Mustard	F89
Oregano	F283
Paprika sweet pepper	F218
Parsley	F86
Sage	F344
Thyme	F273
Vanilla	F234

FISH & SHELLFISH

Abalone	F346
Anchovy	F313
Blue mussel	F37
Catfish	F369
Clam	F207
Crab	F23
Crayfish	F320
Eel	F264
Codfish	F3
Grouper	F410
Haddock	F42
Hake	F307
Halibut	F303
Herring	F205
Jack mackerel (Scad)	F60
Lobster	F80
Mackerel	F206
Octopus	F59
Oyster	F290
Red snapper	F381
Salmon	F41
Sardine (Japanese) pilchard	F61
Scallop	F338
Shrimp	F24
Snail	F314
Sole	F337
Squid	F258
Swordfish	F312
Trout	F204
Tuna	F40
Whitefish	F384

MILK

Alpha lactalbumin	F76
Beta lactoglobulin	F77
Casein	F78
Cheese - cheddar-type	F81
Cheese - mould-type	F82
Cow's whey	F236
Goat milk	F300
Cow's milk	F2
Sheep milk	F325
Sheep whey	F326

MISCELLANEOUS

Cacao	F93
Carob (E410)	F296
Cochineal (Carmine red, E120)	F340
Coffee	F221
Guar, guar gum (E412)	F246
Gum arabic (E414)	F297
Honey	F247
Hop (fruit cone)	F324
Malt	F90
Mushroom (champignon)	F212
Tea	F222
Tragacanth (E413)	F298
Yeast (<i>S. cerevisiae</i>)	F45

Mixed allergens

\$10 for each mix

Note: Requests for more than two of these will exceed our allowance under Medicare

HOUSE DUST

Dust & mite mix Dust and mite mix **HX2** (H2 D1 D2 I6)

ANIMAL DANDER MIXES

Animal mix 1 Cat dander, horse dander, cow dander, dog dander **EX1** (E1 E3 E4 E5)

Animal mix 2 Cat dander, dog dander, guinea pig epithelium, rat, mouse **EX2** (E1 E5 E6 E87 E88)

Animal mix 3 Guinea pig epithelium, rabbit epithelium, hamster epithelium, rat, mouse **EX70** (E6 E82 E84 E87 E88)

Bird mix Budgerigar feathers, canary bird feathers, parakeet feathers, parrot feathers, finch feathers **EX72** (E78 E201 E196 E213 E214)

Feather mix Goose feathers, chicken feathers, duck feathers, turkey feathers **EX71** (E70 E85 E86 E89)

GRASS POLLEN MIXES

Grass mix 1 Cocksfoot, grass pollen (fescue), rye grass, timothy grass, meadow grass **GX1** (G3 G4 G5 G6 G8)

Grass mix 2 Bermuda grass, rye grass, timothy grass, meadow grass, johnson grass, bahia grass **GX2** (G2 G5 G6 G8 G10 G17)

Grass mix 4 Sweet vernal grass, rye grass, common reed, cultivated rye, velvet grass **GX4** (G1 G5 G7 G12 G13)

TREE POLLEN MIXES

Tree mix 1 Box elder, birch, oak, elm, walnut **TX1** (T1 T3 T7 T8 T10)

Tree mix 2 Box elder, oak, elm, cottonwood, pecan hickory **TX2** (T1 T7 T8 T14 T22)

Tree mix 3 Mountain juniper, oak, elm, cottonwood, mesquite **TX3** (T6 T7 T8 T14 T20)

TREE POLLEN MIXES

Tree mix 4 Oak, elm, sycamore, willow, cottonwood **TX4** (T7 T8 T11 T12 T14)

Tree mix 5 Grey alder, hazel, elm, willow, cottonwood **TX5** (T2 T4 T8 T12 T14)

Tree mix 6 Box elder, birch, American beech, oak, walnut **TX6** (T1 T3 T5 T7 T10)

Tree mix 7 Olive, willow, white pine, eucalyptus, acacia, melaleuca **TX7** (T9 T12 T16 T18 T19 T21)

Tree mix 8 Box elder, birch, hazel, oak, sycamore **TX8** (T1 T3 T4 T7 T11)

Tree mix 9 Grey alder, birch, hazel, oak, willow **TX9** (T2 T3 T4 T7 T12)

Tree mix 10 Grey alder, birch, white ash **TX10** (T2 T3 T4 T15)

WEED POLLEN MIXES

Weed & flower mix Common ragweed, mugwort, ox-eye daisy, dandelion, golden rod **WX5** (W1 W6 W7 W8 W12)

Weed mix 1 Common ragweed, mugwort, English plantain, goosefoot lamb's quarters, saltwort **WX1** (W1 W6 W9 W10 W11)

Weed mix 2 Western ragweed, mugwort, English plantain, goosefoot lamb's quarters, scale lenscale **WX2** (W2 W6 W9 W10 W15)

MOULD MIXES

Mould mix 2 *Penicillium chrysogenum*, *Cladosporium herbarum*, *Aspergillus fumigatus*, *Candida albicans*, *Alternaria alternata*, *Setomelanomma rostrata* **MX2** (M1 M2 M3 M5 M6 M8)

Mould mix 4 *A. fumigatus*, *A. niger*, *A. terreus*, *A. flavus* **MX4** (M3 M207 M36 M228)

COMBINATION INHALANT MIXES

Inhalant 3	Bermuda grass, rye grass, bahia grass, common ragweed, English plantain, goosefoot lamb's quarters	RX3	(G2 G5 G17 W1 W9 W10)
Inhalant 4	Sweet vernal grass, bermuda grass, rye grass, common ragweed, mugwort, English plantain	RX4	(G2 G5 G1 W1 W6 W9)

OCCUPATIONAL MIXES

Chemicals 1	Isocyanates (TDI, MDI, HDI), phthalic anhydride	PAX5	(K75 K76 K77 K79)
Chemicals 2	Ethylene oxide, phthalic anhydride, formaldehyde, chloramin T	PAX6	(K78 K79 K80 K85)
Occupational 4	Wheat & soy flour, alpha-amylase, <i>Sitophilus granarius</i>	PAX4	(F4 F14 K87 I202)

FOOD MIXES

Cereal mix	Wheat, oat, maize, sesame seed, buckwheat	FX3	(F4 F7 F8 F10 F11)
Fruit mix	Orange, apple, banana, peach	FX15	(F33 F49 F92 F95)
Meat mix	Pork, beef, chicken	FX73	(F26 F27 F83)
Nut mix	Peanut, hazelnut, brazil nut, almond, coconut	FX1	(F13 F17 F18 F20 F36)
Seafood mix	Fish, shrimp, blue mussel, tuna, salmon	FX2	(F3 F24 F37 F40 F41)
Spice mix 1	Tarragon, marjoram, thyme, lovage	FX70	(F272 F274 F273 F275)
Spice mix 2	Caraway, mace, cardamom, clove	FX71	(F265 RF266 F267 F268)
Spice mix 3	Basil, fennel seed, ginger, anise	FX72	(F269 F219 F270 F271)
Staple food mix	Egg white, cow's milk, fish, wheat, peanut, soybean	FX5	(F1 F2 F3 F4 F13 F14)

FOOD MIXES

Vegetable mix	Carrot, potato, spinach, cucumber	FX19	(F31 F35 F214 F244)
Food mix 7	Tomato, yeast, garlic, onion, celery	FX7	(F25 F45 F47 F48 F85)
Food mix 20	Wheat, rye, barley, rice	FX20	(F4 F5 F6 F9)
Food mix 26	Egg white, cow's milk, peanut, mustard	FX26	(F1 F2 F13 F89)
Food mix 74	Cod, herring, mackerel, plaice	FX74	(F3 F205 F206 F254)

Allergen components

\$40 for each component

ANIMALS

rCan f1 (recombinant dog)	E101
rCan f2 (recombinant dog)	E102
rFel d1 (recombinant cat)	E94
nBos d 6 BSA, cow <i>Bos spp.</i>	E204
nCan f 3 Dog serum albumin <i>Canis familiaris</i>	E221
nFel d 2 Cat serum albumin <i>Felis domesticus</i>	E220

FOODS

nBos d 4 a-lactalbumin, milk <i>Bos spp.</i>	F76
nBos d 5 b-lactoglobulin, milk <i>Bos spp.</i>	F77
nBos d 8 Casein, milk <i>Bos spp.</i>	F78
nBos d Lactoferrin, milk <i>Bos spp.</i>	F334
nGal d 1 Ovomucoid, egg <i>Gallus spp.</i>	F233
nGal d 2 Ovalbumin, egg <i>Gallus spp.</i>	F232
nGal d 3 Conalbumin, egg <i>Gallus spp.</i>	F323
rAra h 1 Peanut <i>Arachis hypogaea</i>	F422
rAra h 2 Peanut <i>Arachis hypogaea</i>	F423
rAra h 3 Peanut <i>Arachis hypogaea</i>	F424
rAra h 8 PR-10, Peanut <i>Arachis hypogaea</i>	F352
rAra h 9 LTP, Peanut <i>Arachis hypogaea</i>	F427
rCor a 1 PR-10, Hazelnut <i>Corylus avellana</i>	F428
rCor a 8 LTP, Hazelnut <i>Corylus avellana</i>	F425
rGad c 1 Cod <i>Gadus morhua</i>	F426
rPen a 1 Tropomyosin, Shrimp <i>Penaeus aztecus</i>	F351
rPru p 1 PR-10, Peach <i>Prunus persica</i>	F419
rPru p 3 LTP, Peach <i>Prunus persica</i>	F420
rPru p 4 Profilin, Peach <i>Prunus persica</i>	F421
rTri a 19 Omega-5 Gliadin, wheat <i>Triticum spp.</i>	F416

Note: These allergens are priced as core individual allergens (\$5 ea)

VENOM

rApi m 1 Phospholipase A2, honey bee	I208
rVes v 1 Phospholipase A1, common wasp	I211
rVes v 5 common wasp	I209
rPol d 5 European paper wasp	I210

TREES

rBet v 1 PR-10, Birch <i>betula verrucosa</i>	T215
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MOULDS

rAlt a 1 (component <i>Alternaria</i>)	M229
rAsp f 3 (recombinant aspergillus)	M220
rAsp f1 (recombinant aspergillus)	M218
rAsp f2 (recombinant aspergillus)	M219
rAsp f4 (recombinant aspergillus)	M221
rAsp f6 (recombinant aspergillus)	M222

LATEX

rHev b 1 Latex <i>Hevea brasiliensis</i>	K215
rHev b 3 Latex <i>Hevea brasiliensis</i>	K217
rHev b 5 Latex <i>Hevea brasiliensis</i>	K218
rHev b 6.01 Latex <i>Hevea brasiliensis</i>	K219
rHev b 6.02 Latex <i>Hevea brasiliensis</i>	K220
rHev b 8 Profilin, Latex <i>Hevea brasiliensis</i>	K221
rHev b 9 Latex <i>Hevea brasiliensis</i>	K222

OCCUPATIONAL ALLERGENS

nCar p 1 Papain, <i>Papaya carica</i>	K201
nAsp o 1 a-amylase <i>Aspergillus oryzae</i>	K87

OTHERS (to exclude CCD reactivity)

nAna c 2 Bromelin, Pineapple <i>Ananas comosus</i>	K202
nO214 MUXF3 CCD, Bromelin	O214

MISCELLANEOUS

Alpha-gal (Gal-alpha-1,3-Gal thyroglobulin, bovine)	U953
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ImmunoCAP ISAC® Allergen component microarray

\$350 for panel of 112 allergen components from 51 allergens

Note: Only some of these components are available as individual allergen component immunoassays

ALLERGEN COMPONENT	ALLERGEN SOURCE COMMON NAME	LATIN NAME	PROTEIN GROUP
FOOD ALLERGENS			
nGal d 1	Egg white	<i>Gallus domesticus</i>	Ovomucoid
nGal d 2	Egg white	<i>Gallus domesticus</i>	Ovalbumin
nGal d 3	Egg white	<i>Gallus domesticus</i>	Conalbumin/ovotransferrin
nGal d 5	Egg yolk/chicken meat	<i>Gallus domesticus</i>	Livetin/Serum albumin
nBos d 4	Cow's milk	<i>Bos domesticus</i>	Alpha-lactalbumin
nBos d 5	Cow's milk	<i>Bos domesticus</i>	Beta-lactoglobulin
nBos d 6	Cow's milk and meat	<i>Bos domesticus</i>	Serum albumin
nBos d 8	Cow's milk	<i>Bos domesticus</i>	Casein
nBos d lactoferrin	Cow's milk	<i>Bos domesticus</i>	Transferrin
rGad c 1	Cod	<i>Gadus callarias</i>	Parvalbumin
nPen m 1	Shrimp	<i>Penaeus monodon</i>	Tropomyosin
nPen m 2	Shrimp	<i>Penaeus monodon</i>	Arginine kinase
nPen m 4	Shrimp	<i>Penaeus monodon</i>	Sarcoplasmic Ca-binding protein
rAna o 2	Cashew nut	<i>Anacardium occidentale</i>	Storage protein, 11S globulin
rBer e 1	Brazil nut	<i>Bertholletia excelsa</i>	Storage protein, 2S albumin
rCor a 1.0401	Hazelnut	<i>Corylus avellana</i>	PR-10 protein
rCor a 8	Hazelnut	<i>Corylus avellana</i>	Lipid transfer protein (nsLTP)
nCor a 9	Hazelnut	<i>Corylus avellana</i>	Storage protein, 11S globulin
nJug r 1	Walnut	<i>Juglans regia</i>	Storage protein, 2S albumin
nJug r 2	Walnut	<i>Juglans regia</i>	Storage protein, 7S globulin
nJug r 3	Walnut	<i>Juglans regia</i>	Lipid transfer protein (nsLTP)
nSes i 1	Sesame seed	<i>Sesamum indicum</i>	Storage protein, 2S albumin
rAra h 1	Peanut	<i>Arachis hypogaea</i>	Storage protein, 7S globulin
rAra h 2	Peanut	<i>Arachis hypogaea</i>	Storage protein, conglutin
rAra h 3	Peanut	<i>Arachis hypogaea</i>	Storage protein, 11S globulin
nAra h 6	Peanut	<i>Arachis hypogaea</i>	Storage protein, conglutin
rAra h 8	Peanut	<i>Arachis hypogaea</i>	PR-10 protein
rAra h 9	Peanut	<i>Arachis hypogaea</i>	Lipid transfer protein (nsLTP)
rGly m 4	Soybean	<i>Glycine max</i>	PR-10 protein
nGly m 5	Soybean	<i>Glycine max</i>	Storage protein, beta-conglycinin
nGly m 6	Soybean	<i>Glycine max</i>	Storage protein, glycinin
nFag e 2	Buckwheat	<i>Fagopyrum esculentum</i>	Storage protein, 2S albumin
rTri a 14	Wheat	<i>Triticum aestivum</i>	Lipid transfer protein (nsLTP)
rTri a 19.0101	Wheat	<i>Triticum aestivum</i>	Omega-5 gliadin
nTri a aA_TI	Wheat	<i>Triticum aestivum</i>	
nAct d 1	Kiwifruit	<i>Actinidia deliciosa</i>	
nAct d 2	Kiwifruit	<i>Actinidia deliciosa</i>	Thaumatine-like protein
nAct d 5	Kiwifruit	<i>Actinidia deliciosa</i>	
rAct d 8	Kiwifruit	<i>Actinidia deliciosa</i>	PR-10 protein
rApi g 1	Celery	<i>Apium graveolens</i>	PR-10 protein
rMal d 1	Apple	<i>Malus domestica</i>	PR-10 protein
rPru p 1	Peach	<i>Prunus persica</i>	PR-10 protein
rPru p 3	Peach	<i>Prunus persica</i>	Lipid transfer protein (nsLTP)
AEROALLERGENS			
nCyn d 1	Bermuda grass	<i>Cynodon dactylon</i>	Grass group 1
rPhl p 1	Timothy grass	<i>Phleum pratense</i>	Grass group 1
rPhl p 2	Timothy grass	<i>Phleum pratense</i>	Grass group 2
nPhl p 4	Timothy grass	<i>Phleum pratense</i>	
rPhl p 5	Timothy grass	<i>Phleum pratense</i>	Grass group 5
rPhl p 6	Timothy grass	<i>Phleum pratense</i>	
rPhl p 7	Timothy grass	<i>Phleum pratense</i>	Polcalcin
rPhl p 11	Timothy grass	<i>Phleum pratense</i>	
rPhl p 12	Timothy grass	<i>Phleum pratense</i>	Profilin
rAln g 1	Alder	<i>Alnus glutinosa</i>	PR-10 protein
rBet v 1	Birch	<i>Betula verrucosa</i>	PR-10 protein
rBet v 2	Birch	<i>Betula verrucosa</i>	Profilin
rBet v 4	Birch	<i>Betula verrucosa</i>	Polcalcin

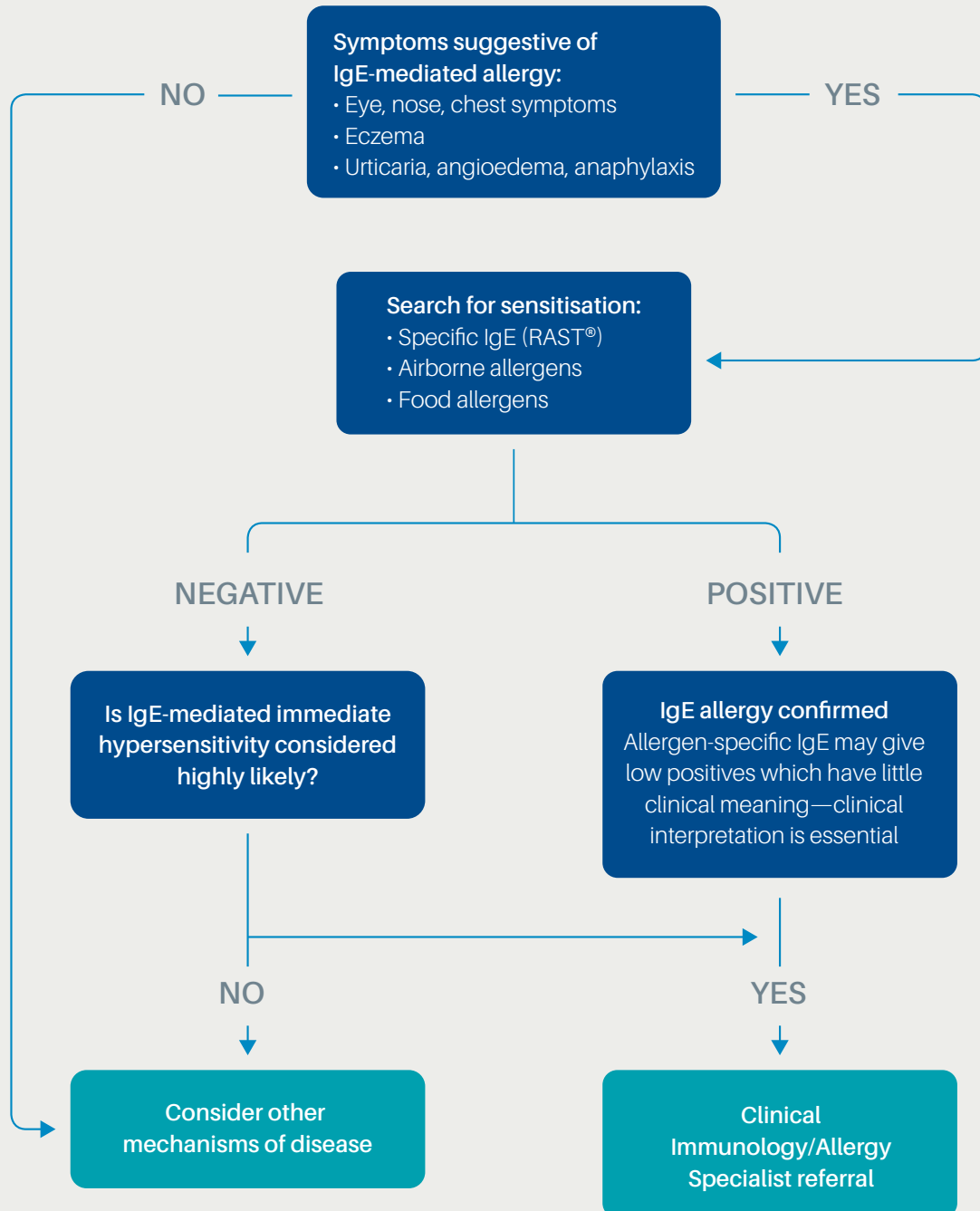
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ALLERGEN COMPONENT	ALLERGEN SOURCE COMMON NAME	LATIN NAME	PROTEIN GROUP
AEROALLERGENS			
rCor a 1.0101	Hazel pollen	<i>Corylus avellana</i>	PR-10 protein
nCry j 1	Japanese cedar	<i>Cryptomeria japonica</i>	
nCup a 1	Cypress	<i>Cupressus arizonica</i>	
nOle e 1	Olive	<i>Olea europaea</i>	
nOle e 7	Olive	<i>Olea europaea</i>	Lipid transfer protein (nsLTP)
rOle e 9	Olive	<i>Olea europaea</i>	
rPla a 1	Plane tree	<i>Platanus acerifolia</i>	
nPla a 2	Plane tree	<i>Platanus acerifolia</i>	
rPla a 3	Plane tree	<i>Platanus acerifolia</i>	Lipid transfer protein (nsLTP)
nAmb a 1	Ragweed	<i>Ambrosia artemisiifolia</i>	
nArt v 1	Mugwort	<i>Artemisia vulgaris</i>	
nArt v 3	Mugwort	<i>Artemisia vulgaris</i>	Lipid transfer protein (nsLTP)
rChe a 1	Goosefoot lamb's quarters	<i>Chenopodium album</i>	
rMer a 1	Annual mercury	<i>Mercurialis annua</i>	Profilin
rPar j 2	Wall pellitory	<i>Parietaria judaica</i>	Lipid transfer protein (nsLTP)
rPla l 1	English plantain	<i>Plantago lanceolata</i>	
nSal k 1	Saltwort	<i>Salsola kali</i>	
rCan f 1	Dog	<i>Canis familiaris</i>	Lipocalin
rCan f 2	Dog	<i>Canis familiaris</i>	Lipocalin
nCan f 3	Dog	<i>Canis familiaris</i>	Serum albumin
rCan f 5	Dog	<i>Canis familiaris</i>	Arginine esterase
nEqu c 1	Horse	<i>Equus caballus</i>	Lipocalin
nEqu c 3	Horse	<i>Equus caballus</i>	Serum albumin
rFel d 1	Cat	<i>Felis domesticus</i>	Uteroglobin
nFel d 2	Cat	<i>Felis domesticus</i>	Serum albumin
rFel d 4	Cat	<i>Felis domesticus</i>	Lipocalin
nMus m 1	Mouse	<i>Mus musculus</i>	Lipocalin
rAlt a 1	Alternaria	<i>Alternaria alternata</i>	
rAlt a 6	Alternaria	<i>Alternaria alternata</i>	Enolase
rAsp f 1	Aspergillus	<i>Aspergillus fumigatus</i>	
rAsp f 3	Aspergillus	<i>Aspergillus fumigatus</i>	
rAsp f 6	Aspergillus	<i>Aspergillus fumigatus</i>	Mn superoxide dismutase
rCla h 8	Cladosporium	<i>Cladosporium herbarum</i>	
rBlo t 5	House dust mite	<i>Blomia tropicalis</i>	
nDer f 1	House dust mite	<i>Dermatophagoides farinae</i>	
rDer f 2	House dust mite	<i>Dermatophagoides farinae</i>	
nDer p 1	House dust mite	<i>Dermatophagoides pteronyssinus</i>	
rDer p 2	House dust mite	<i>Dermatophagoides pteronyssinus</i>	
rDer p 10	House dust mite	<i>Dermatophagoides pteronyssinus</i>	Tropomyosin
rLep d 2	Storage mite	<i>Lepidoglyphus destructor</i>	
rBla g 1	Cockroach	<i>Blattella germanica</i>	
rBla g 2	Cockroach	<i>Blattella germanica</i>	
rBla g 5	Cockroach	<i>Blattella germanica</i>	
nBla g 7	Cockroach	<i>Blattella germanica</i>	Tropomyosin
OTHER			
rApi m 1	Honey bee venom	<i>Apis mellifera</i>	Phospholipase A2
nApi m 4	Honey bee venom	<i>Apis mellifera</i>	Melittin
rPol d 5	Paper wasp venom	<i>Polistes dominulus</i>	Venom, Antigen 5
rVes v 5	Common wasp venom	<i>Vespula vulgaris</i>	Venom, Antigen 5
rAni s 1	Anisakis	<i>Anisakis simplex</i>	
rAni s 3	Anisakis	<i>Anisakis simplex</i>	Tropomyosin
rHev b 1	Latex	<i>Hevea brasiliensis</i>	
rHev b 3	Latex	<i>Hevea brasiliensis</i>	
rHev b 5	Latex	<i>Hevea brasiliensis</i>	
rHev b 6.01	Latex	<i>Hevea brasiliensis</i>	
rHev b 8	Latex	<i>Hevea brasiliensis</i>	Tropomyosin
nMUXF3	Sugar epitope from Bromelain		Tropomyosin

Allergy: The diagnostic pathway





DOUGLASS
HANLY MOIR
PATHOLOGY



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