

# **Food Intolerance**

## **Dietary Investigation and Management**

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# Outline: Learning objectives

- Recognise the clinical signs and symptoms of food intolerance
- Understand the principles of the Diagnostic Elimination Diet and Challenge protocol which involves:
  - Implementing the Diagnostic Elimination Diet
  - When and how to challenge
  - How to prescribe a 'personal' diet
  - Understanding the principles of liberalisation
  - Recognise factors affecting long-term management



# Patients often present with:

- Multiple symptoms
- Many triggers
- Modified diets
  - 90% recognise food triggers
  - 50% on a modified diet
- Varying reactivity
- Seeking more information and guidance about
  - where to begin and
  - what foods are safe?



## Successful diagnosis: Rowe 1930's

*“Successful diagnosis and control of adverse food reactions needs*

- *Physicians input and supervision*
- *Cooperation of the patient*
- *Execution of dietary details....*

*.... The value of diet trial supplemented by food tests must be understood”*

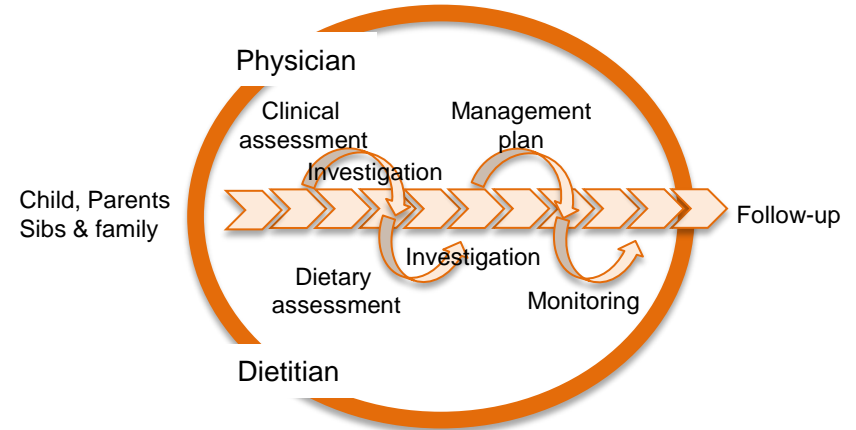
Rowe, 1931

# Multidisciplinary approach

## Allergy Clinic

Doctor will take:

- Take a very careful history to identify all possible cause(s) of a patient's reactions
- Exclude disease
- Order appropriate tests
- Give medical advice
- Refer to a dietitian for dietary investigation and management



# The role of the dietitian

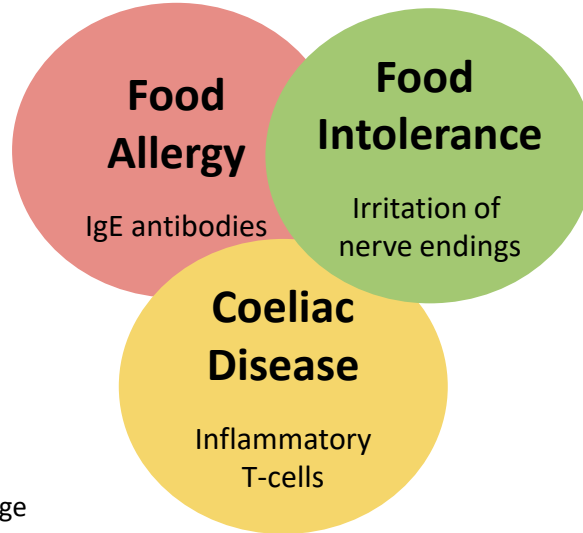
- Take a very careful history and recognise the important clues
- Ask about other diseases/conditions
- Know which tests are appropriate and relevant
- Refer to physician for medical follow-up
  - To exclude disease
  - Order appropriate tests
  - Give medical advice

ASCIA: [www.allergy.org.au](http://www.allergy.org.au) &  
<https://www.allergy.org.au/hp/papers/unorthodox-testing-and-treatment>

Venter C and Meyer R. Proc Nutrition Soc. 2010;69:11-24  
Groetch M. Practical Gastroenterology, 2013; Series 123:46-54  
Skypala I. et al Clinical and Translational, 2015; 5:7

# Adverse reactions to food

Infants with eczema  
F/H asthma, eczema, hayfever  
Immediate reproducible reactions  
Egg, milk, nuts, seafood, wheat, soy  
Nuts & seafood often persist  
Airborne allergens  
SPT, specific IgE blood test  
Complete avoidance



Any age  
F/H Coeliac disease, diabetes, thyroid disease  
Chronic reproducible reactions to small amounts gluten  
HLA gene association  
Blood test for antibodies to tissue transglutaminase  
Small bowel biopsy  
Strict gluten free diet  
Life-long immune reactivity

Any age  
F/H hives, headache, IBS, mouth ulcers  
Delayed variable reactions  
Dose dependent, cumulative  
Life-long susceptibility, variable tolerance  
Natural chemicals and additives  
Wheat, milk, soy  
Diagnostic elimination diet and challenges

# Procedure: The Diagnostic elimination diet and challenge protocol

n=1 trial



## ASSESSMENT

Could my patient have food intolerance?

### Diagnostic Elimination Diet

Does food play a role in their symptoms?

### Challenges

Which foods/chemicals trigger symptoms?

### Liberalisation 'Personal' diet + find threshold(s)

Confirm challenge results and identify tolerance threshold(s)

### Long-term management


Adjusting their diet: balancing food, symptoms and lifestyle



# Patient assessment: Very careful history

- **Main reason for presentation**
- **Symptoms** – Frequency & severity, onset & duration, one-off or recurrent episodes, age of onset
- **Anxiety, depression, eating disorder**
- **Other conditions** - Food allergy, coeliac disease
- **Dietary intake, restrictions, food reactions, triggers**
- **Reactions to smells**
- **Medications**
- **Supplements** - Vitamins, minerals, herbals, probiotics
- **Quality of life**
- **Children: Anthropometry** - Adequate growth & development

## Symptom Diet Questionnaire


**ALLERGY UNIT ASSESSMENT FORM**  
 INITIAL APPOINTMENT - ADULT
 PATIENT LABEL

Today's date: / /    Height (without shoes) \_\_\_\_\_ cm    Weight \_\_\_\_\_ kg  
 Measured by RPAH staff     Reported by parent/carer/patient

**PLEASE ANSWER ALL QUESTIONS**

1. What is/are the main reason(s) for coming to the Allergy Unit?

\_\_\_\_\_

\_\_\_\_\_

2. Please indicate the symptoms you have AT PRESENT?

SYMPTOM	FREQUENCY				SEVERITY			
	Never	Occas.	Monthly	Weekly	Daily	Mild	Mod.	Severe
<b>EXAMPLE SYMPTOM</b>								
Eczema								
Hives								
Swelling (e.g. face/hands)								
Rashes (other)								
Nose/sinus problems								
Asthma								
Mouth ulcers								
Difficulty swallowing								
Nausea								
Vomiting								
Indigestion								
Bell's								
Wind/Gas								
Bloating/Discomfort								
Stomach pain/Cramps								
Diarrhoea								
Constipation								
Headache/Migraine								
Tongue								
Muscle/Joint aches								
Bladder/Vaginal irritation								
<b>Other (specify)</b>								
.....								
.....								
<b>Comments</b>	_____ _____ _____							

# Patient assessment: Diet history

**Diet History** RPAH Allergy Unit

Record the **CURRENT TYPICAL MEALS + FOODS** you (or your child) eat.  
Don't forget to include items such as stocks, sauces, herbs and spices, butter, margarine and sugar.

AGE 30

**Breakfast**  
→ Oats (1cup) made w/ H<sub>2</sub>O.  
→ half a banana  
→ frozen Raspberries (handfull)  
→ Instant Nescafe with light milk

**Morning Tea**  
→ fruit or carb snack (muesli bar, apple, rocket melon etc.)

**Lunch**  
→ sushi (salmon, avocado, tuna)  
→ rotamanie (soy beans)  
→ pasta, rice with different sauces (spaghetti, mices)

**Afternoon Tea**  
→ biscuit, banana bread,  
→ coffee again (see breakfast)

**Dinner**  
very different each night  
Thai (Tom Yum Soup)  
\* rice; pasta;  
\* different meat  
\* different sauces (chili, onion, different pastes)

**Supper**  
\* sometimes a beer or a wine (2x a week) (light) (white)

**MEDICATIONS or SUPPLEMENTS?** E.g. blood pressure tablets, fish oil, probiotics, herbs, vitamins and minerals.

Are you (or your child) currently on a **SPECIAL DIET**, or **RESTRICTING or AVOIDING ANY FOODS?** (Give details)  
Currently: Kiwi  
In the Past: Kiwi

CHECKLIST	Which one? How often?
Baby formula	
Water	2 litres a day
Tea normal (sucralose)	1-2 a day
Coffee (regular)	2-3 a day
Soft drink/soda	in coffee
Juice	
Cordial	
Soft drink	cola zero (Santitas)
Alcohol	beer, white wine
Other	
Crackers/Crispbreads	
Cake (sweets)	1 every 2-3 days
Chocolate	1 every 2 days
Nuts/seeds	20g of nuts most d
Lollies	
Chewing gum/mints	
Crops	
Dried fruit	→ in milk nites
Commonly eaten Fruit	Apple, Banana, Melon,
Commonly eaten Vegetables	Tomato, Onion, Garlic, carrot,
Cabbage	OK/Dialike/ Never Eat/ React?
Brussel sprout	OK/Dialike/ Never Eat/ React?
Garlic	OK/Dialike/ Never Eat/ React?
Leek	OK/Dialike/ Never Eat/ React?
Shallot	OK/Dialike/ Never Eat/ React?
Onions	OK/Dialike/ Never Eat/ React?
Legumes/Lentils	OK/Dialike/ Never Eat/ React?
Spice, stock cube, sauces	Uses a bit of different ones + in Extra Virgin Olive Oil
Oil (specify)	
Margarine (specify)	
Eating out / Takeaways	Thai, Vietnamese, Japanese 2x a week

Have you had any REACTIONS TO FOODS?	FOOD	SYMPTOMS
	Kiwi	my tongue itches

**Food/food chemicals**      **Colour**

**Salicylates**      **Green**

**Amines**      **Yellow**

**Glutamates**      **Orange**

**Preservatives, colours & additives**      **Pink**

**Wheat**      **Purple**

**Milk/Soy**      **Blue**

**Low chemical FODMAP Foods**

**Cabbage**

**Brussels sprouts**

**Leek**

**Garlic**

**Legumes / lentils**

**Pears**

**Diet History** RPAH Allergy Unit

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# The Diagnostic elimination diet

n=1 trial



1

2

3

4

Assessment

Could my patient have food intolerance?

**DIAGNOSTIC ELIMINATION DIET**

**Does food play a role in their symptoms?**

Challenges

Which foods/chemicals trigger symptoms?

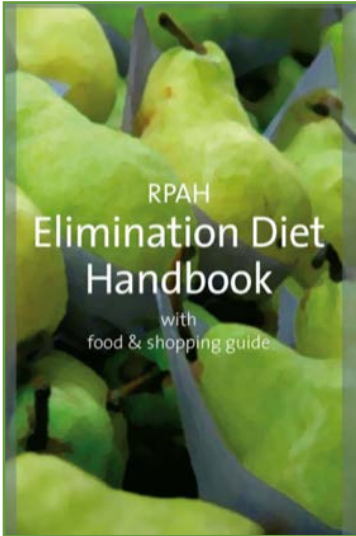
Liberalisation  
'Personal' diet + find threshold(s)

Confirm challenge results and identify tolerance threshold(s)

Long-term management

Adjusting their diet: balancing food, symptoms and lifestyle

# The Diagnostic elimination diet : Exclusions



- natural salicylates
- natural amines
- natural glutamates & added flavour enhancers
- preservatives
- food colours
- +/- wheat, milk, soy
- +/- FODMAP foods

Swain 1988, [www.allergy.net.au](http://www.allergy.net.au)

# The Diagnostic elimination diet: Modifying the diet

## Chemicals



strict, moderate, simple

- Symptoms
  - Severity
  - Frequency
- Pregnancy
- Breastfeeding
- Work circumstances
- Holidays / travelling
- Eating disorders
- Personal preferences

LOW foods are almost never a problem

MODERATE and HIGH foods may upset you, depending on how sensitive you are and how much you eat

VERY HIGH foods often cause symptoms in sensitive people

FOOD CHEMICAL CHART			
VEGETABLES			
LOW	MODERATE	HIGH	VERY HIGH
Potato brushed white, peeled Lettuce iceberg Bamboo shoots tinned and fresh Beans butter, french, string or snake Bean shoots Broccoli sprouts Cabbage mid-green (dumhead), savoy, wombok (Chinese cabbage) Celery Chives Choke Garlic very small amounts only Leek Manjushoa sprouts Shallot Scallot 	Asparagus Beetroot Bok choy pak choy Carrot Cucumber fresh, peeled Napa cabbage Lettuce cos, red & green coral, red & green oak, mignonette Marrow Parsnip Peas green, snow peas, sugar snap peas Potato blue, new, pink, purple, red, yellow Pumpkin butternut, squash Sweet potato Turnip Zucchini peeled 	Artichoke Avocado just ripe Broccoli, broccolini Cauliflower Corn Cucumber with peel Endive Fennel Gai lan Chinese broccoli Parsley Parsnips grey, lent, JAP Radishes Rocket Snow pea sprouts Spring onions Tomatoes fresh, peeled, sliced Water chestnut Watercress Zucchini with peel	Avocado soft, mashable Basil Broccoli stems from beans Capsicums green, red, yellow Celery Chilli Choy sum Eggplant, eggfruit Garlic mustard greens Herbs & spices dried or fresh Kang kong Chinese spinach Olives Onions Pak-foi vegetables cucumber gherkin, silver, pickled onions, pickles Mint Mushrooms all types Sauerkraut fermented cabbage Seaweed Spinach English, silver beet Tomatoes dried, sun-dried, juice, puree, paste, sauce Tofu Vegetable peas, soups, stock cubes, liquid, powder
STRICT elimination diet	MODERATE approach	AVOID	
	SIMPLE approach	AVOID	AVOID

CHOOSE THE ELIMINATION DIET APPROACH THAT SUITS YOU BEST

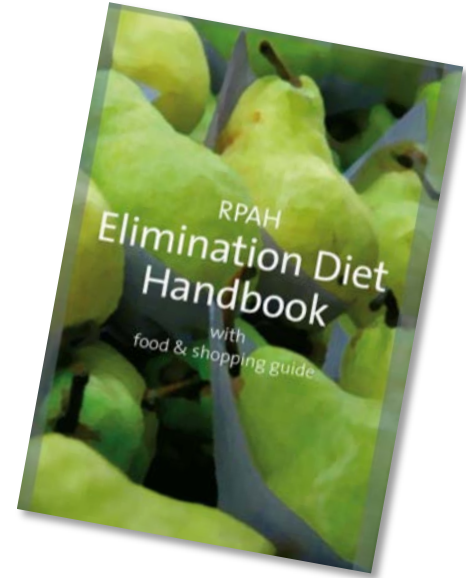
# The Diagnostic elimination diet: Timeframe

Follow the diet for **at least 2 weeks**, up to 6 weeks

Watch out for **'withdrawal'** reactions (first 2 weeks)

Keep a detailed **food and symptom diary**

- all food and drink
- symptoms
- medications and supplements
- non-diet factors



**AIM:** 5 days in a row free of symptoms

# The Diagnostic elimination diet: Challenge protocol

n=1 trial



## Assessment

Could my patient have food intolerance?

## Diagnostic Elimination Diet

Does food play a role in their symptoms?

## CHALLENGES

Which foods/chemicals trigger symptoms?

## Liberalisation 'Personal' diet + find threshold(s)

Confirm challenge results and identify tolerance threshold(s)

## LONG-TERM MANAGEMENT

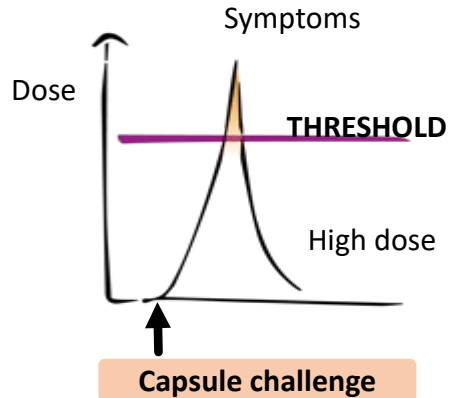
Adjusting their diet: balancing food, symptoms, and lifestyle

# The Diagnostic elimination diet: Food challenges

## Capsule Challenges

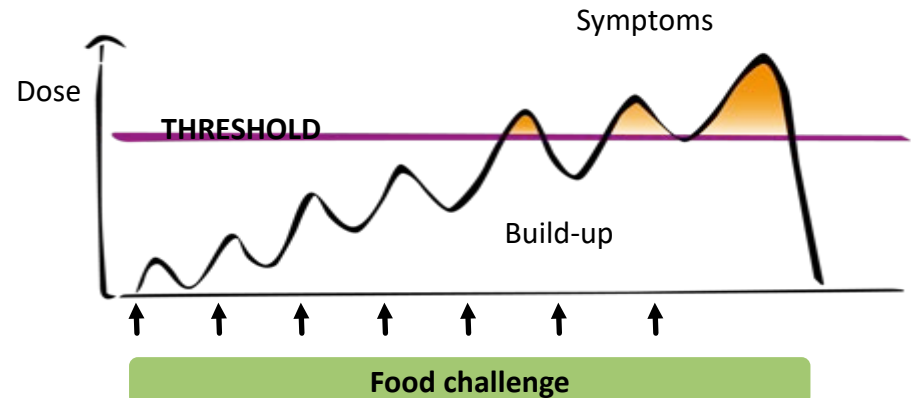


Contain a **high dose** of a **single substance** designed to exceed symptom threshold rapidly



## Food Challenges

Involve repeated small doses which can take several days to **build up** to threshold level





# The Diagnostic elimination diet: Food challenges

## Whole Foods

Wheat  
Milk  
Soy

## Natural Chemicals

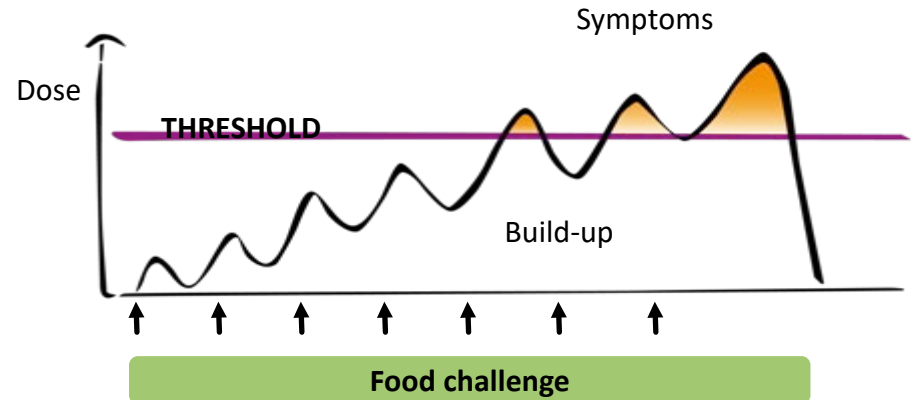
Salicylates  
Amines  
Glutamates

## Additives

Antioxidants  
Colours  
Propionates  
  
Nitrates & nitrites  
Sorbates  
Benzoates  
Sulphites

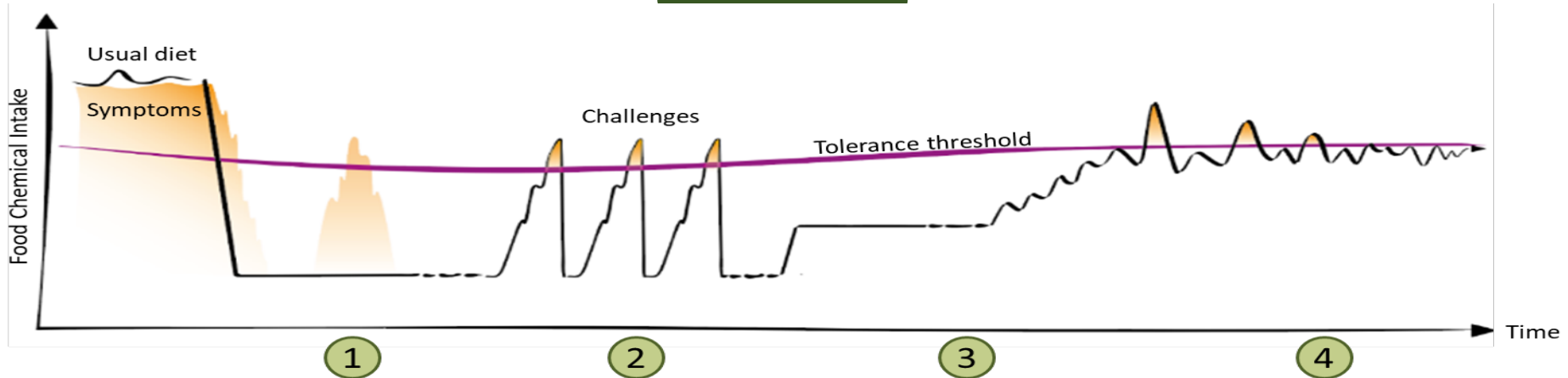
## Food Challenges

Involve repeated small doses  
which can take several days to  
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# The Diagnostic elimination diet: Liberalisation

n=1 trial



## Assessment

Could my patient have food intolerance?

## Diagnostic Elimination Diet

Does food play a role in their symptoms?

## Challenges

Which foods/chemicals trigger symptoms?

## LIBERALISATION 'Personal' diet + find threshold(s)

Confirm challenge results and identify tolerance threshold(s)

## LONG-TERM MANAGEMENT

Adjusting their diet: balancing food, symptoms, and lifestyle

# Liberalisation: Creating a patient's 'Personal' diet

This is a diet which avoids dietary triggers based on a patient's challenge results

## Key steps

**Add** foods containing chemicals patient **DID NOT** react to on challenge

**Avoid** foods containing chemicals patient **DID** react to on challenge

**3-4 weeks** feeling well

*Why?*

Allow time to recover from reactions during the challenge period

Confirm challenge results

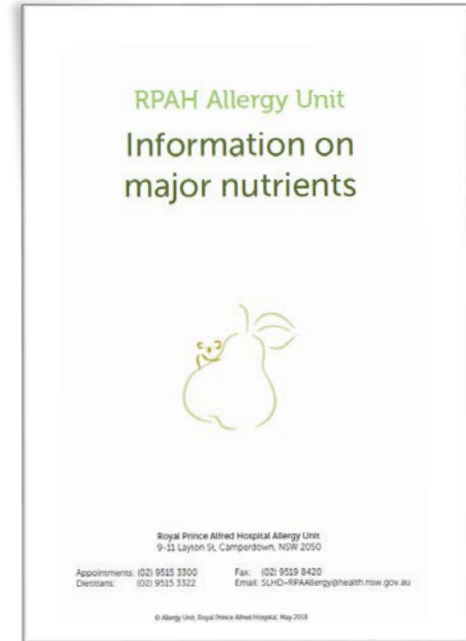
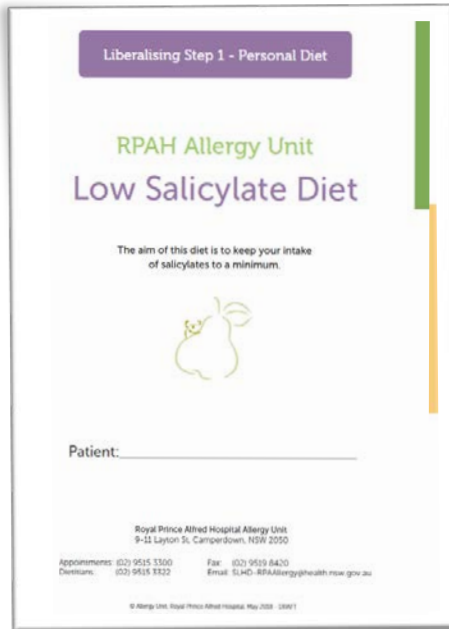
Check that no 'safe' foods added back into the diet are problematic for the patient



# Liberalisation: Creating a patient's 'Personal' diet

## Key resources

### Personal Diet Booklets



# The Diagnostic elimination diet: Liberalisation

n=1 trial



## Assessment

Could my patient have food intolerance?

## Diagnostic Elimination Diet

Does food play a role in their symptoms?

## Challenges

Which foods/chemicals trigger symptoms?

## LIBERALISATION 'Personal' diet + find threshold(s)

Confirm challenge results and identify tolerance threshold(s)

## LONG-TERM MANAGEMENT

Adjusting their diet: balancing food, symptoms, and lifestyle

# Liberalisation: Finding thresholds

## Aim

identify tolerance thresholds for:

- chemicals (salicylates, amines, natural glutamates)
- foods (wheat, milk, soy)



## Key steps

re-introduce chemicals and/or foods reacted to, **one at a time**

gradually increase intake in stepwise fashion

continue until threshold is found (maximum tolerated amount)

continue consuming this tolerated amount while working out threshold for next chemical/food

continue to keep **food and symptom diary**

# Liberalisation: Threshold guidelines

## 1. Choose an order to re-introduce foods and food chemicals

Consider:

- least severe reaction
- nutrition
- personal food preference
- social commitment, travel, lifestyle preference



## 2. Choose a starting amount

- consider degree of sensitivity
- based on challenge results
- range of foods to start with

Degree of sensitivity	Amount
Extremely sensitive	Teaspoon
Very sensitive	Tablespoon
Moderately sensitive	½ serve
Somewhat sensitive	Serve

## 3. Choose a starting frequency

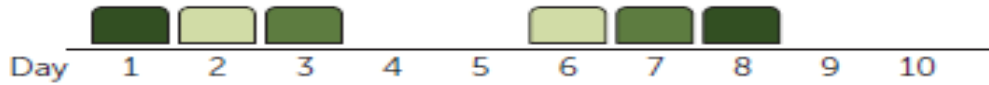
# Liberalisation: Threshold guidelines

## Starting frequency (examples)



Have starting amount for 2 days in a row with 2 days break in between

OR



Have starting amount for 3 days in a row with 2 days break in between

OR



Have starting amount every day

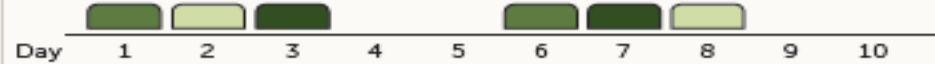


# Liberalisation: Threshold guidelines

## Increase in amount (example)

\* Teaspoon, tablespoon,  
½ serve or serve

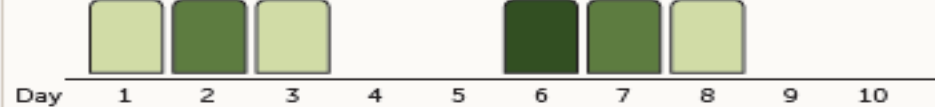
1 measure\* for 3 days  
in a row with 2 days  
break in between



2 measures\* for 3  
days in a row with 2  
days break in  
between



3 measures\* for 3  
days in a row with 2  
days break in  
between



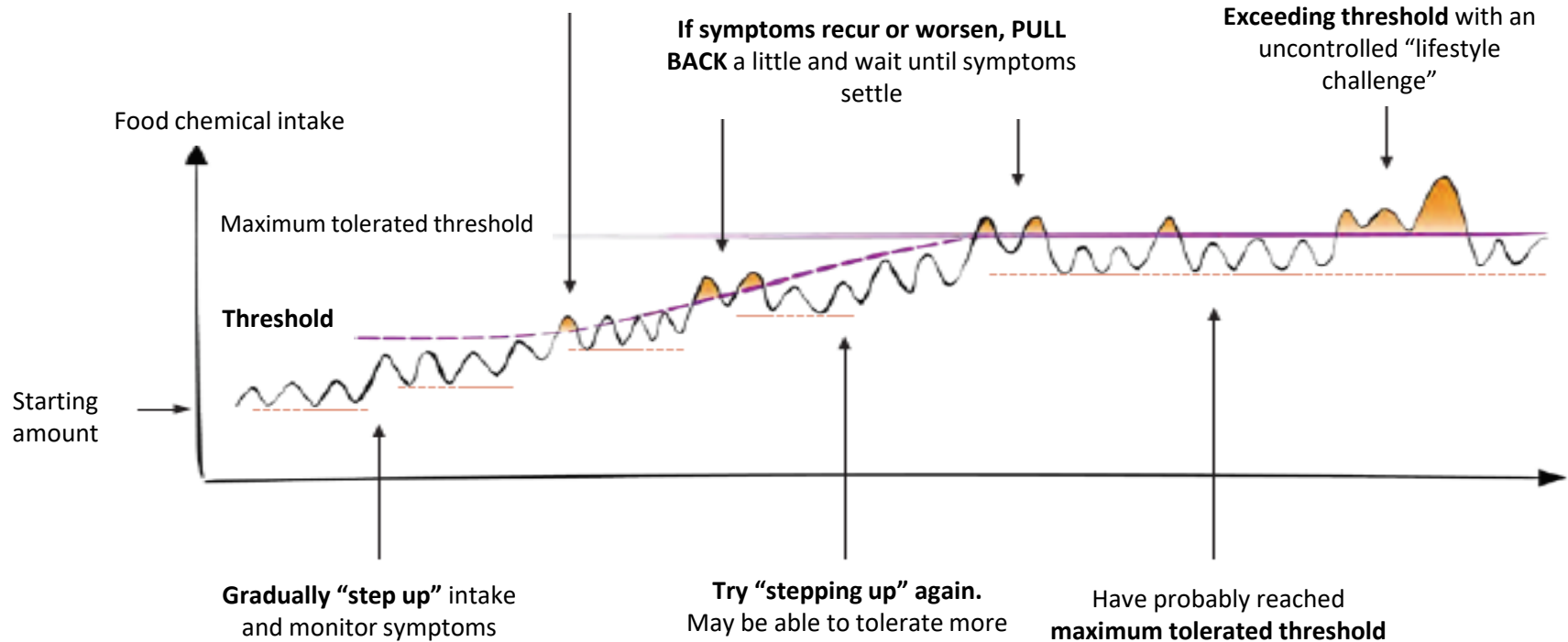
2-3 weeks

2-3 weeks

CONTINUE

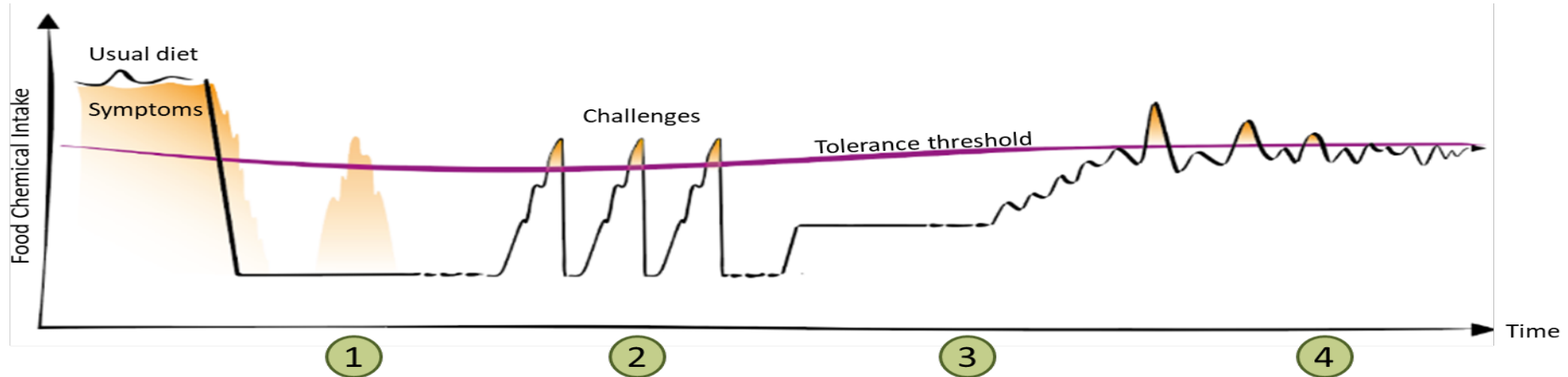
# Liberalisation: Threshold guidelines

If get symptoms and are unsure whether tolerating this level, **CONTINUE** at the same level and see if symptoms settle



# The diagnostic elimination diet: Long-term diet

n=1 trial



## Assessment

Could my patient have food intolerance?

## Diagnostic Elimination Diet

Does food play a role in their symptoms?

## Challenges

Which foods/chemicals trigger symptoms?

## Liberalisation 'Personal' diet + find threshold(s)

Confirm challenge results and identify tolerance threshold(s)

## LONG-TERM MANAGEMENT

Adjusting their diet: balancing food, symptoms and lifestyle

# Long-term management: Balancing act

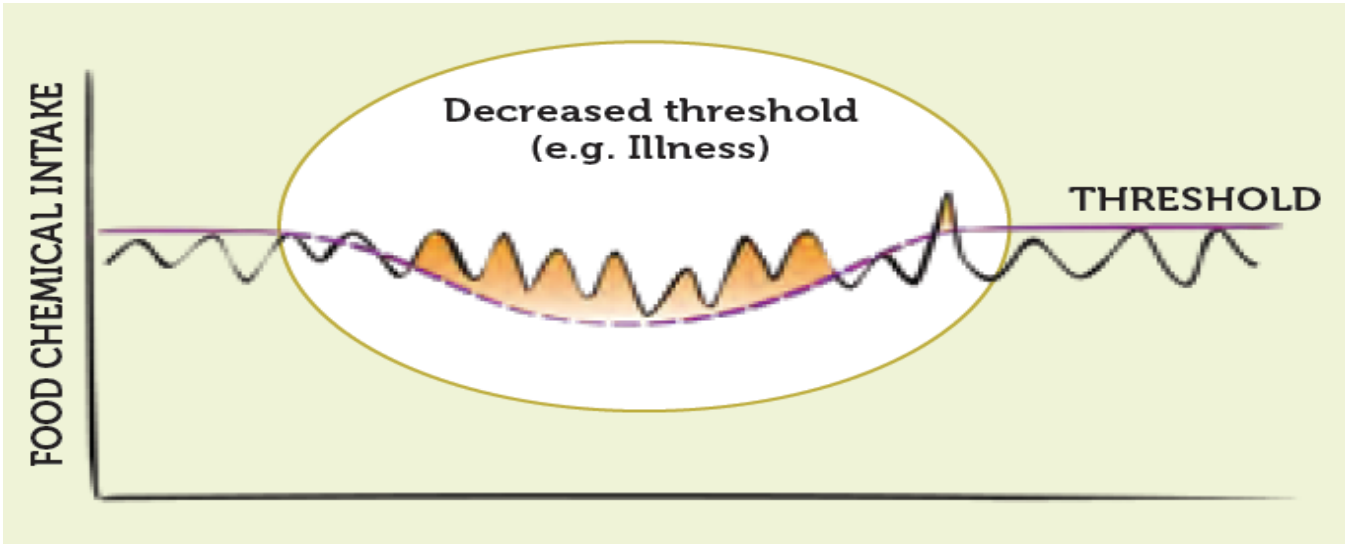


# Long-term management: Non-diet factors



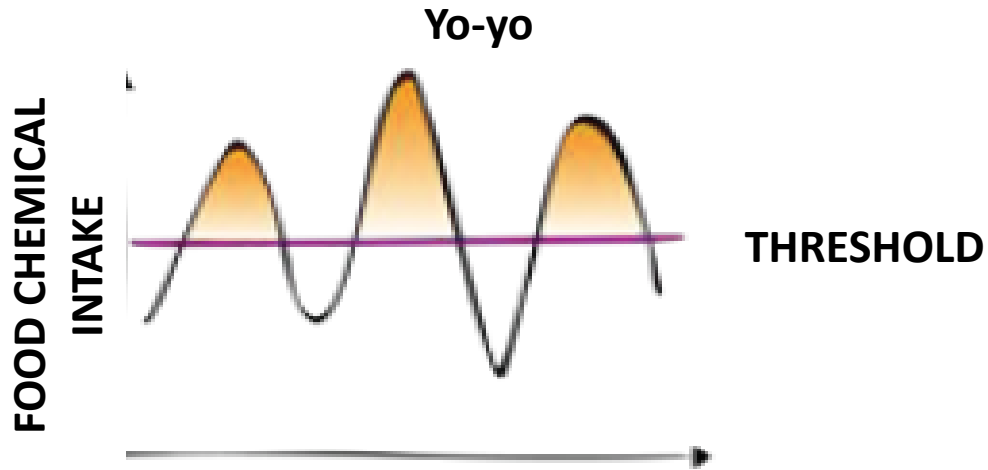
# Long-term management: Common scenarios

Temporary lowering of threshold

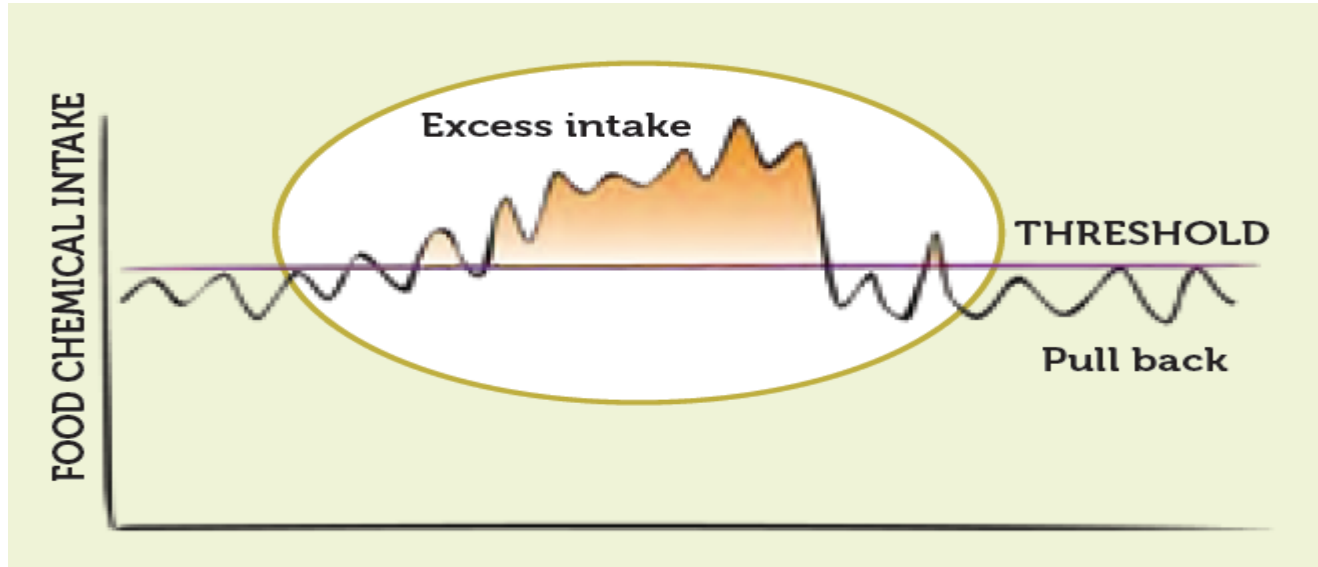


# Long-term management: Common scenarios

'Yo-yo'ing



# Long-term management: Exceeding your threshold





## Milk free diets

**Adult calcium RDI**

1000-1300 mg / d

**Calcium intakes in milk free diet**

300 mg / d



# Food & Nutrition

## Milk free diets

Calcium content of foods →

### Milk alternatives

calcium fortified (e.g. rice, soy)

2-3 serves / d

smoothies, hot drinks, added to foods

extra serve meat or alternative protein food/d

### Calcium supplement

if unable to meet recommended intakes

CALCIUM CONTENT OF FOODS		
Food	Amount	Calcium (mg)
<b>Low chemical</b>		
Rice drink, fortified	1 cup	300
Tofu (soy bean curd)	½ cup	150
Oysters, raw	½ cup	100
Beans (cooked)	1 cup	100
Cabbage (cooked)	1 cu	50
Cashews	1 cup	50
Egg	1 whole	25
Meat, chicken or fish	60 g	10
<b>Dairy foods</b>		
Milk	1 cup	300
Yoghurt, natural	200 g	300
Ricotta	½ cup	300
Cottage cheese	1 cup	200
Ice cream	1 cup	200
<b>Soy foods</b>		
Soy drink, fortified	250 ml	300-400
<b>Wheat foods</b>		
English muffin	1 whole	150
Bread, sandwich slice	1 slice	25
<b>Moderate chemical</b>		
Bok choy (cooked)	1 cup	200
Butternut pumpkin (cooked)	1 cup	80
Carrots (cooked)	1 cup	50

■ Contains salicylate

# Food & Nutrition

## Low salicylate diets

### Adult vitamin A RDI

400 µg / d REs

### Best sources of vitamin A →

green beans, chinese cabbage

egg yolk, fortified margarine

### Dairy or soy drink

2-3 serves / d

### Moderating or liberalising

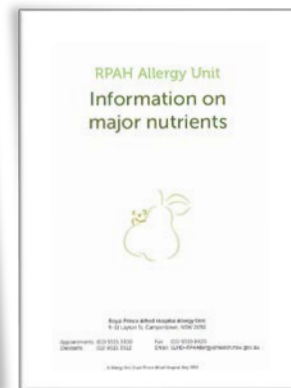
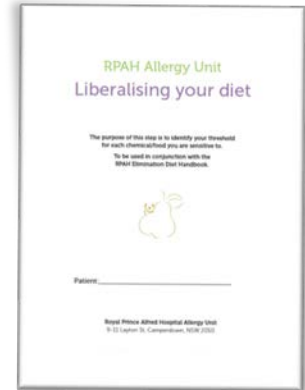
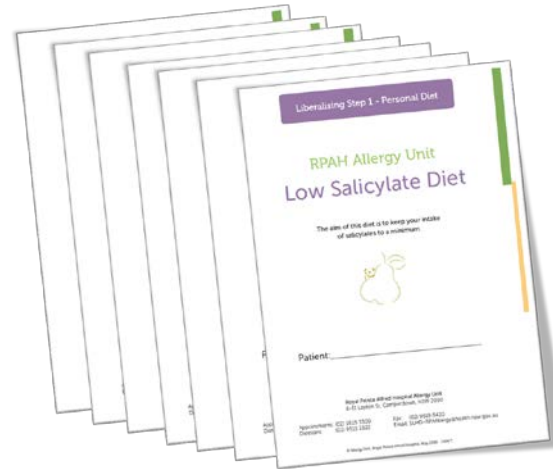
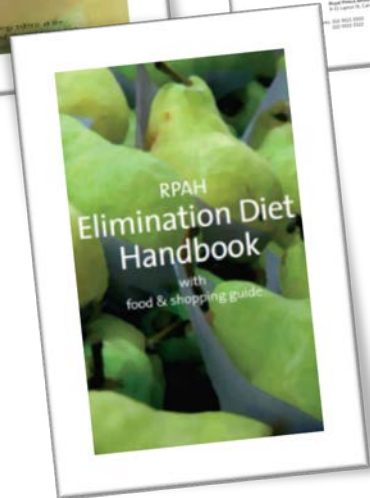
carrot, sweet potato (beta-carotene)

¼ cup sweet potato

VITAMIN A CONTENT OF FOODS		
Food	Amount	Vit A (mg)
<b>Low chemical</b>		
Nuttelex (original/lite/Kosher)	1 Tbsp	200
Egg	2 whole	100
Green beans (cooked/raw)	½ cup	50
Chinese cabbage/wombok (cooked)	1 cup	50
Carob powder	1 Tbsp	50
Chicken thigh	2 med thigh	50
Leek (cooked)	½ cup	25
Brussels sprouts (cooked)	½ cup	25
<b>Dairy foods</b>		
Butter	2 tsp	150
Cow's milk (regular fat)	1 cup	150
Cow's milk (reduced fat, lite)	1 cup	50
Yoghurt, natural	200 g	50
<b>Soy foods</b>		
Sanitarium SoGood soy drink	1 cup	100
<b>Moderate chemical</b>		
Sweet potato (cooked)	1 Tbsp	250
Carrot (cooked/raw)	1 Tbsp	200
Butternut pumpkin (cooked)	1 Tbsp	100
Salmon/tuna	1 med fillet	50
Pea, green (cooked)	½ cup	50

■ Contains salicylate ■ Contains amines ■ Contains glutamate

# Conclusion



# Acknowledgements and assistance

## Acknowledgement

Dr Robert Loblay, Dr Velencia Soutter

The dietitians and team at the RPAH Allergy Unit

## Resources

[www.slhd.nsw.gov.au/rpa/allergy/](http://www.slhd.nsw.gov.au/rpa/allergy/)

[www.allergy.net.au](http://www.allergy.net.au)

## Further assistance

[SLHD-RPAAllergy@health.nsw.gov.au](mailto:SLHD-RPAAllergy@health.nsw.gov.au)

