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Chronic pelvic pain in women

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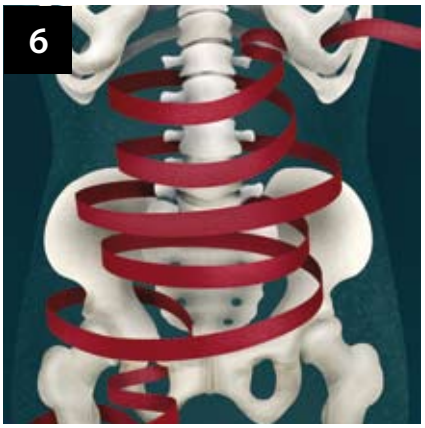
CONTENTS

Issue 70 September 2015



CONTENTS

Issue 70 September 2015

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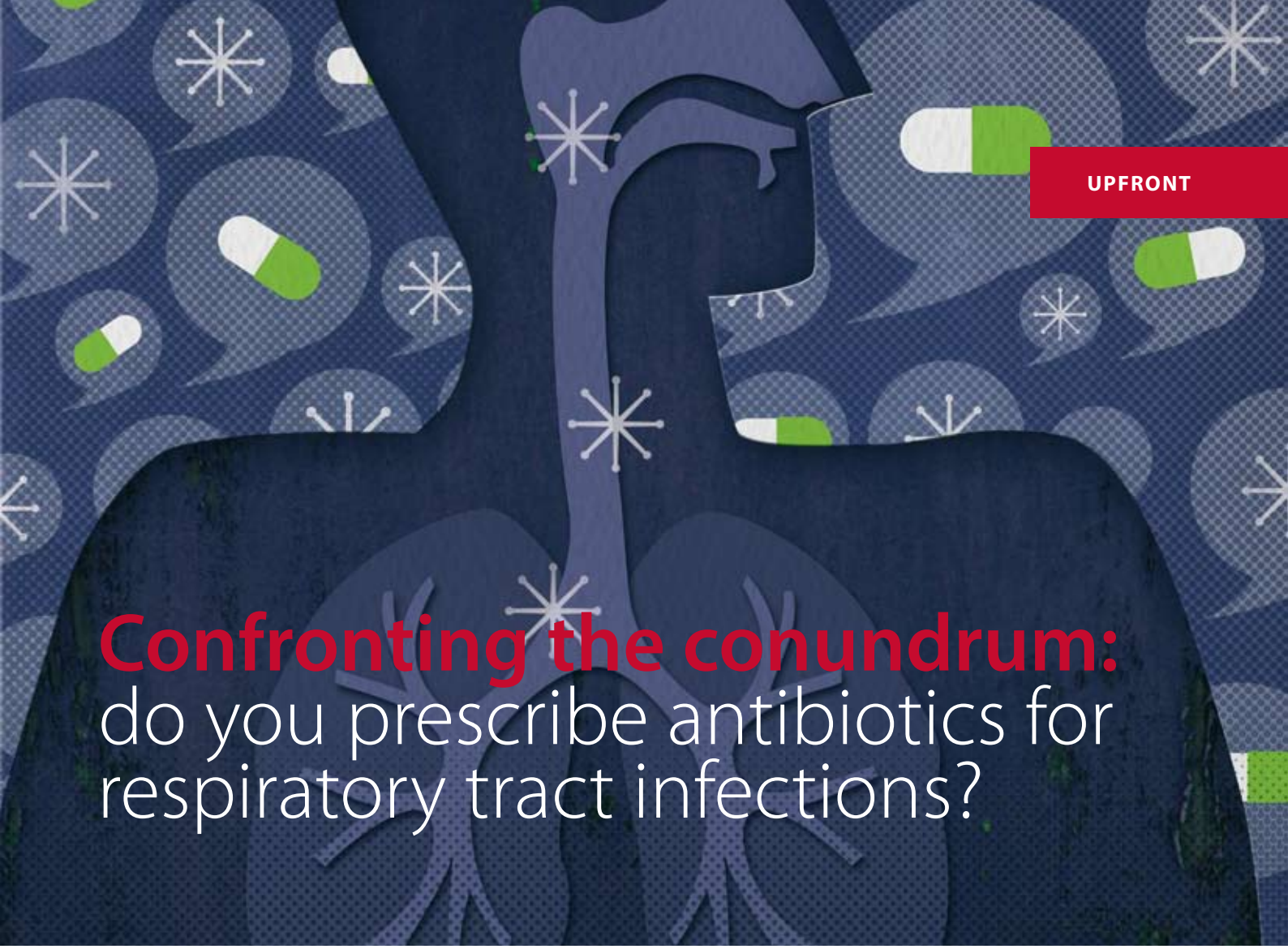


Confronting the conundrum: do you prescribe antibiotics for respiratory tract infections?

The June edition of Best Practice Journal (BPJ 68) was themed as an "Antibiotic Issue". It is increasingly important that we focus on sensible antibiotic prescribing in light of the rising levels of antimicrobial resistance, and the impending "antibiotic apocalypse". But what does sensible prescribing actually mean?

For some situations it is relatively easy to decide that an antibiotic is not necessary, but in other scenarios, it is much more difficult to make the best clinical decision. Take for example the current influenza season in New Zealand. Waiting rooms are full of patients, who have "dragged themselves from their beds" to come to see their general practitioner – some may even be back for their second or third visit because they are just not getting better. When does it become appropriate to prescribe an antibiotic in this scenario?

We want to create a situation where prescribers are confident and comfortable in their decision to prescribe antibiotics. But equally, we cannot bury our heads in the sand and do nothing about the sometimes unnecessary, detrimental and wasteful use of antibiotics. It is easy to follow rules, when rules can be made. However, there are usually exceptions to every rule, and in these cases it comes down to relying on your experience, your knowledge of the principles of antibiotic use and your clinical judgement.

The following selected reader feedback was received online in response to our antibiotic-themed issue, in particular our debate on prescribing antibiotics for respiratory tract infections:

"Just as every patient is different so is every doctor and we, therefore, vary in the degree of comfort we have with a particular strategy. I have trialled and since abandoned the back pocket prescription strategy. Having taken note of my patient's concerns, done an examination and explained to the patient how reassuring the findings were, declared a diagnosis of viral infection, and sympathetically explained that antibiotics are of no value in their case and can lead to side-effects it seemed incongruent to then give a prescription of antibiotics. I felt it gave the message 'but I might be wrong' or 'if you don't get better, don't come back and see me'."

"In Northland we have the issue regarding rheumatic fever. The expectations for antibiotics differ in certain demographics and

reasonably so. However, despite all the antibiotic prescribing, Group A strep has not developed resistance to penicillin. I would suggest that the majority of emerging resistance is related to the hospital antibiotic prescribing to immunosuppressed patients with chronic problems and frequently with open wounds. Antibiotics are used indiscriminately in the farming industry and they are the same antibiotics we use to treat patients. Last year was a particularly bad year for pneumonia, and I struggle with denying patients potentially life-saving medication, when GP access can be limited both due to availability and cost on a premise that I am not entirely convinced is accurate."

"This whole issue of inappropriate prescribing of antibiotics for RTIs has been known about for decades since the 1970s but the fact that research continues on this and that bpac^{nz} has to keep publishing the likes of the above [the RTI prescribing debate] merely shows that traditional ways of changing doctor behaviour don't work. What about some education on the best ways to change the prescribing habits of the recalcitrant antibiotic prescribers?"

"I think more patients are happy not to receive an antibiotic these days, but some continue to be demanding and can be hard to resist. What about some public patient education on TV, especially prior to/during the annual 'flu' season."

"I find it easier to get patients on side with less antibiotics by reframing the problem from a community issue (i.e. antibiotic resistance) to a personal issue, i.e. 'we don't want to make it too easy for your immune system otherwise it might not be able to deal with a more serious infection next time'. It's all about patient centredness!"

"When a patient presents with a RTI I would take a history and examine them. If it looked to be likely a viral infection rather than pneumonia, whooping cough, bronchiectasis or infectious exacerbation of COPD with change in colour of sputum, I would discuss the likely cause of symptoms, symptomatic treatment, rest, hygiene/infection control, and when to return if things didn't improve. I worked in a practice with a 50% Indian population who had a high expectation with antibiotics so I often used the back pocket script. While this sometimes caused confusion it helped me reduce the rate of antibiotic prescription by about 50%. I have sometimes stopped antibiotics early, but usually for an adverse reaction like upset stomach, rash, nausea. There weren't any negative outcomes."

"Often patients just need reassurance rather than antibiotics, but this necessitates a full examination followed by the information that antibiotics are unnecessary and will not make them feel better. But always offer to review if symptoms change or worsen."

"I feel that the presentation of patients in the practice has subtly changed over the years and I tend to see less of the obvious viral infections unless they need a medical certificate. Also the concept of back pocket scripts has helped enormously. I do worry about the local ED which often sees children out of hours despite there being an on call GP available . Often scripts for broad spectrum antibiotics are issued with minimal reason."

Appropriate antibiotic prescribing is going to continue to be a topic for discussion in New Zealand and worldwide. There are a multitude of factors that influence our prescribing decisions and also the patients' behaviour – the skill is to walk the right line and obviously there will be many different approaches taken to achieve this. The collective experience of the profession can help individual prescribers make the best decisions on a case-by-case basis. We encourage you to continue to contribute to this discussion. If you have found particular strategies that work well in your practice, consider sharing these suggestions online at: **www.bpac.org.nz/conundrum**

Further reading

"It's easy to prescribe antibiotics. It takes time, energy and trust not to do so". Dr Margaret McCartney, a general practitioner from Glasgow, provides an interesting viewpoint in the BMJ:

Blaming doctors won't reduce antibiotic overuse. BMJ 2015;351:h4697. Available from: **www.bmj.com/content/351/bmj.h4697**

Medicines leaflets now available
in the NZF for Children

High quality medicines information leaflets are now available for parents and carers in the New Zealand Formulary for Children (NZFC). Approximately 15 leaflets will be available by 1 October, 2015; this number will be added to gradually (see list opposite).

The leaflets have been produced in partnership with the United Kingdom Medicines for Children (MFC – **www.medicinesforchildren.org.uk**), and were developed by experts in children's medicines who worked with parents and carers to understand what information they need to know about giving medicines to children, and how they wanted this information presented. A panel of parents and carers reviews every leaflet before it is published in the United Kingdom.

The leaflets are structured into sections, which cover questions, including:

Why is it important for my child to take this medicine?
How should I give the medicine?
What if I forget to give the medicine, or give too much?
Are there any possible side effects?

Selected leaflets have been adapted by the NZFC editorial team for the New Zealand audience, by including the medicine products and brands that are available here, and adapting any related advice. The leaflets can be viewed online and printed out for parents/carers. If a leaflet is available for a medicine, it will be located at the bottom of the NZFC drug monograph in the Patient Advice section.

The NZFC also includes some information leaflets written in New Zealand for parents and carers, e.g. "**Giving paracetamol safely to babies and children**".


Medicines for Children information for parents and carers

Ibuprofen for pain and inflammation

This leaflet is about the use of ibuprofen to reduce mild or moderate pain and inflammation. This might be after an injury, or due to a long-term condition such as juvenile arthritis.

NZF

This leaflet has been written specifically about the use of this medicine in children. The information may differ from that provided by the manufacturer. Please read this leaflet carefully. Keep it somewhere safe so that you can read it again.

If your child is allergic to other drugs for inflammation or has asthma, check with your doctor before giving this medicine.

Name of drug

Ibuprofen

Common brands: Nurofen® for Children, Ibugesic®, Brufen®, Fenpaed®, Advil®, ACT-3®, Medix®. **Modified release:** Brufen SR®

Why is it important for my child to take this medicine?

It is important to give ibuprofen, as advised by your doctor, to help control your child's pain. It will work best for inflammation and long-term pain when your child takes it regularly for a few days. This leaflet is about ibuprofen prescribed by your doctor. If you have bought ibuprofen to treat your child's pain, it is important to follow the instructions for your child's age that are given with the packet you bought.

What is ibuprofen available as?

- **Tablets:** 200 mg, 400 mg, 600 mg; modified-release: 800 mg
- **Chewable tablet:** 100 mg
- **Capsules:** 200 mg
- **Liquid medicine:** 100 mg in 5 mL, 200 mg in 5 mL; these may contain sugar

When should I give ibuprofen?

Ibuprofen is usually given **three** or **four times** a day. Your doctor will tell you how often to give it.

- **Three times each day:** this should be once in the morning, once in the early afternoon and once in the evening. Ideally, these times are at least 6 hours apart, for example 8 am, 2 pm and 8 pm.
- **Four times a day:** this is usually first thing in the morning, at about midday, late in the afternoon and at bedtime. Ideally, these times are at least 4 hours apart, for example 8 am, midday, 4 pm and 8 pm.

Modified-release tablets

If your child has pain all the time, your doctor may prescribe modified-release tablets. These are given once each day, usually in the evening.

⚠ Do not give modified-release tablets every 6 hours.

Give the medicine at about the same time(s) each day so that this becomes part of your child's daily routine, which will help you to remember.

How much should I give?

Your doctor will work out the amount of ibuprofen (the dose) that is right for *your* child. The dose will be shown on the medicine label.

⚠ **It is important that you follow your doctor's instructions.**

How should I give it?

⚠ It is best to give ibuprofen with, or just after, a meal, so that it does not upset your child's stomach. Do not give it on an empty stomach.

Tablets and capsules should be swallowed with a glass of water, juice or similar. Your child should not chew the tablet or capsules.

Liquid medicine: Measure out the right amount using an oral syringe or medicine spoon. You can get these from your pharmacist. Do not use a kitchen teaspoon as it will not give the right amount.

When will the medicine start working?

- Your child should start to feel less pain 20–30 minutes after taking ibuprofen but it will have more effect against pain and inflammation when your child has been taking it regularly for a few days.
- For some types of long-term inflammation and pain, your child will need to take ibuprofen regularly for a few weeks for it to work properly.

What if my child is sick (vomits)?

- If your child is sick less than 30 minutes after having a dose of ibuprofen, give them the same dose again.
- If your child is sick more than 30 minutes after having a dose of ibuprofen, **do not** give them another dose. Wait at least 6 hours before giving another dose of ibuprofen.

What if I forget to give it?

- If your child is in pain, give the missed dose as soon as you remember.
- You must then **wait at least 6 hours** before giving the next dose.

⚠ Never give a double dose of ibuprofen.

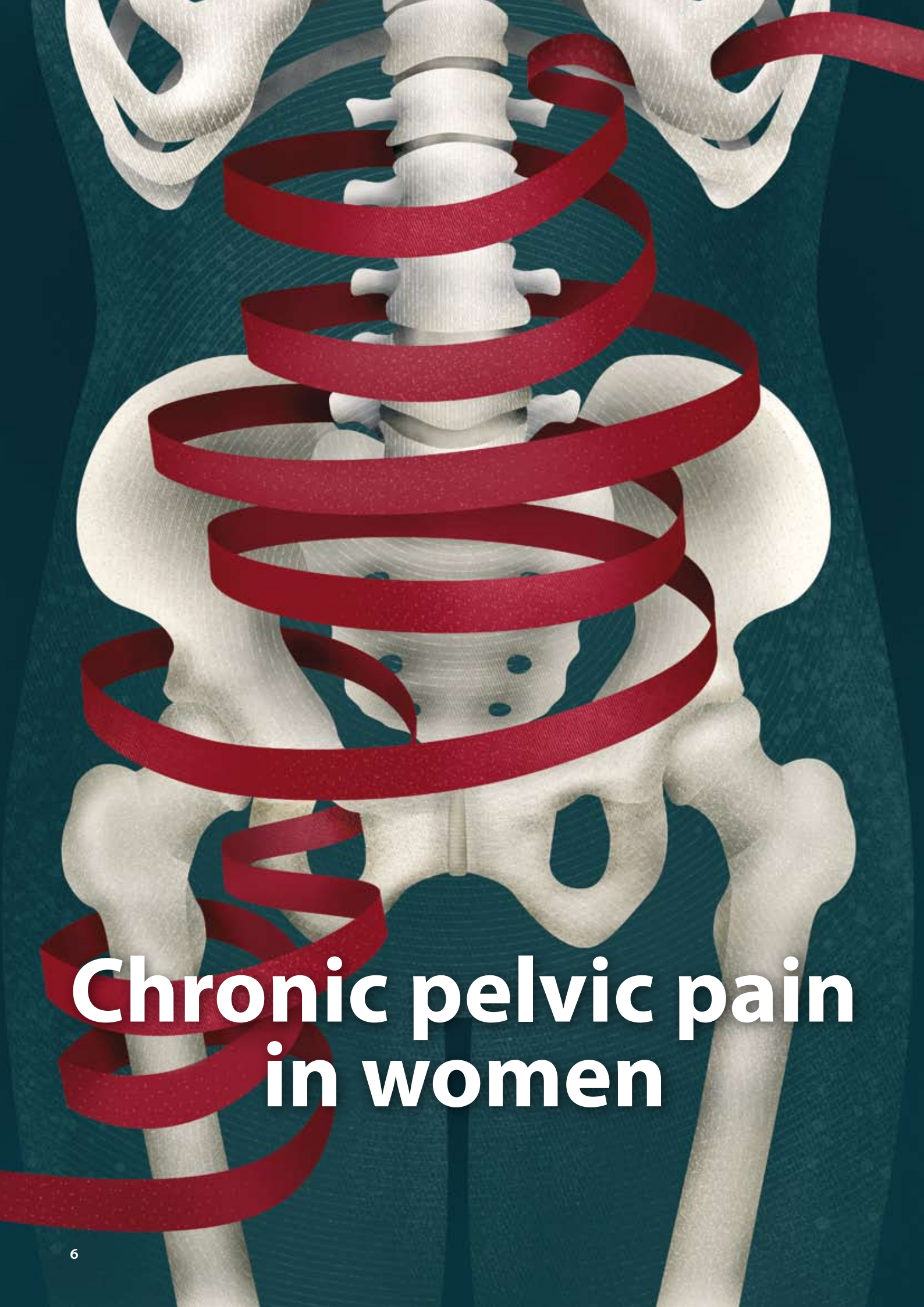
What if I give too much?

- If you think you may have given your child an extra dose of ibuprofen by mistake, wait at least 12 hours before giving another dose.
- If you are concerned that you may have given more than one extra dose, contact your doctor or the NZ National Poisons Centre 0800 764 766 (0800 POISON) or take your child to hospital straight away.
- Take the medicine container or packaging with you, even if it is empty. This will be useful to the doctor. Have the packaging with you if you telephone for advice.

Leaflets available in the NZFC

- Ibuprofen
- Baclofen for muscle spasm
- Amitriptyline for neuropathic pain
- Ferrous fumarate
- Ferrous sulfate (includes oral liquid)
- Carbamazepine
- Clobazam
- Clonazepam
- Lamotrigine
- Phenobarbital
- Phenytoin
- Valproate

To find out more, visit: **www.nzfchildren.org.nz**



Chronic pelvic pain in women

Chronic pelvic pain can cause significant disruption to the lives of the women it affects. It can arise not only from pathology affecting any of the structures located within the pelvis and lower abdomen, but also related areas such as the skeletal system, nerves or muscles. When a specific pathophysiological cause is identified, management is tailored to this. However, for some women the underlying cause of their pelvic pain will never be identified and this can be challenging. In these instances, a multi-disciplinary approach should be used for both assessment and optimal management, to reduce the risk of fragmented care. This article focuses on the general strategies of management, rather than the treatment options for each of the multiple conditions that can contribute to chronic pelvic pain.

Key practice points

- Chronic pelvic pain is defined as intermittent or constant pain in the lower abdomen or pelvis of at least six months duration, that does not occur exclusively with menstruation or intercourse
- Women with chronic pelvic pain report a lower quality of life, with high rates of functional impairment, psychosocial distress and sexual dysfunction, risk being labelled as difficult or needy and may struggle to be believed when accessing healthcare services
- Chronic pelvic pain can arise from pathology affecting any of the structures located within the pelvis and lower abdomen, as well as other structures related to these areas, such as the skeletal system, pelvic floor muscles and nerves, or there may be no cause identified
- Assessment begins with acknowledging the pain and understanding how this affects the woman's life. Red flags should be excluded and specific aetiologies considered. A comprehensive history covers the characteristics of the pain, contributing factors and co-morbidities. Assess for musculoskeletal abnormalities, as well as performing abdominal and pelvic examination, including evaluation of pelvic floor muscles. Laboratory tests can rule out infection; ultrasound and referral for laparoscopy may be appropriate in some cases.
- Unless a specific cause is found that can be treated, management focuses on strategies for pain modulation, including exercise, diet and sleep. Analgesia and adjuvant medicines may be considered, such as paracetamol, NSAIDs, TCAs and gabapentin. The overall aim is to provide the woman with support to self-manage and be able to cope with her pain.

Part 1: Understanding chronic pelvic pain

The enigma that is chronic pelvic pain

"Twenty years ago, I would have told you that I knew everything there was to know about pelvic pain. Ten years ago, I would have told you that no one knew anything about pelvic pain. Today, I can tell you that we have learned a lot in the last few years. There is still a great deal to be learned."[1]

Chronic pelvic pain is defined as intermittent or constant pain in the lower abdomen or pelvis of at least six months duration, that does not occur exclusively with menstruation or intercourse.[2] Chronic pelvic pain, however, should be considered a symptom rather than a diagnosis, and there is debate as to what the precise definition should be. Recent European guidelines recognise a more encompassing view of chronic pain and state that it is perceived to arise from structures related to the pelvis and is "often associated with negative cognitive, behavioural, sexual and emotional consequences as well as with symptoms suggestive of lower urinary tract, sexual, bowel, pelvic floor or gynaecological dysfunction".[3]

Chronic pelvic pain has a major impact on women's lives

Women with chronic pelvic pain report a lower quality of life, with high rates of functional impairment, psychosocial distress and sexual dysfunction.[4] They risk being labelled as difficult or needy and may struggle to be believed when accessing healthcare services (see: "Women's experiences of living with chronic pelvic pain", over page).[5] These women are often prescribed inappropriate analgesics, such as opioids, which does not address the underlying cause and can be associated with adverse effects.[6] There is considerable economic cost associated with chronic pelvic pain – both for the patient, the wider health care system and society.[7,8]

Women's experiences of living with chronic pelvic pain

Women often describe their chronic pelvic pain as relentless and overwhelming. It threatens their ability to lead a normal life. Unpredictable symptoms can make them feel powerless, and women struggle to understand why they feel so much pain without identifiable pathology. The hidden nature of pelvic pain generates a culture of secrecy which can isolate and embarrass, causing feelings of low self-esteem and mood. Chronic pelvic pain may create tension at work and at home, and have a profound effect on relationships.[5]

"I don't know if my pain is abnormal or whether this is normal for women"

"I am embarrassed to talk about my pelvic pain to others: people will think I am just moaning"

"I need to know what is causing my pain so that others believe me"

"My doctor does not listen to me or believe me, but even though I am getting nowhere, I keep going back"

Four key themes have been identified that are important for women with chronic pelvic pain; women want:[7]

1. To receive personal care by a supportive and understanding health care team
2. To be taken seriously as a patient with genuine pain
3. To be given an explanation as much as a cure – both for women with or without identified pathology
4. To be reassured that the pain is not caused by cancer, that the pain can be treated and that other women experience similar pain

Prevalence varies widely

Estimates of the prevalence of chronic pelvic pain vary widely depending on the definition used and range from 2% to 27% of adult females worldwide.[9, 10] A 2001 New Zealand survey found that one-quarter of women (25.4%) aged between 18 and 50 years had experienced pelvic pain over the preceding three month period.[11] Prevalence varied by ethnicity and age, the authors, however, acknowledge that their sample group was slightly skewed towards older, more affluent women.[11] Māori women (18.8%) and women from other ethnicities (14.1%) were less likely to report chronic pelvic pain than non-Māori women (27.4%). The highest rates in this study were in the 26–30 and 31–35 year age groups.[11]

What causes chronic pelvic pain?

Chronic pelvic pain can arise from pathology affecting any of the structures located within the pelvis and lower abdomen, as well as other structures related to these areas, e.g. skeletal system, pelvic floor muscles and nerves, or there may be no cause identified.[3, 12] "Chronic pelvic pain syndrome" is the appropriate diagnosis where pain is the dominant feature in the absence of pathology.[3, 13]

Endometriosis, chronic infection and irritable bowel syndrome frequently cause chronic pelvic pain, and specific treatment can be implemented to manage these conditions. However, in some women the pain will continue despite appropriate identification and management.[12] In some cases the pathology may be an incidental finding.[12] Although a peripheral stimulus may have produced pain initially, additional mechanisms produce chronic pain due to central nervous system modulation.[3] These mechanisms may be associated with other sensory, behavioural and psychological phenomena, which is why women with chronic pelvic pain require multi-disciplinary care.[3]

Women with chronic pelvic pain also have a higher incidence of other chronic pain syndromes, such as bladder pain syndrome (interstitial cystitis) and fibromyalgia, as well as irritable bowel syndrome.[14] There is significant overlap

Table 1: Conditions that may cause or contribute to chronic pelvic pain in women[2, 3, 8]

System	Examples of conditions affecting that system
Gynaecological	Endometriosis, adenomyosis, adhesions (secondary to infection or surgery), chronic pelvic inflammatory disease, pelvic organ prolapse, pelvic congestion syndrome, benign tumours (e.g. uterine, ovarian), vulval or vaginal pain syndromes, ovarian remnant syndrome, trapped ovary syndrome
Gastrointestinal	Constipation, irritable bowel syndrome, inflammatory bowel disease, diverticulitis and diverticulosis, chronic appendicitis or Meckel's diverticulum, adhesions
Urological	Bladder pain syndrome (interstitial cystitis), urethral pain syndrome
Neuromuscular	Trauma (e.g. secondary to vaginal delivery), surgery (e.g. any abdominal wall incision including caesarean section), pelvic floor muscle pain syndrome, vaginal muscle spasm, neuralgia from nerve entrapment or irritation, pain arising from the lower part of the spine (e.g. from sprains, strains, fractures, degenerative disease, disc lesions), sacroiliac joint dysfunction, symphysis pubis dysfunction, coccygeal pain, piriformis syndrome, myofascial pain syndrome, abdominal migraine
Psychological	Depression, anxiety, history of sexual abuse

N.B. Malignant disease is often excluded from lists of this type although it is well recognised as a cause of pelvic pain

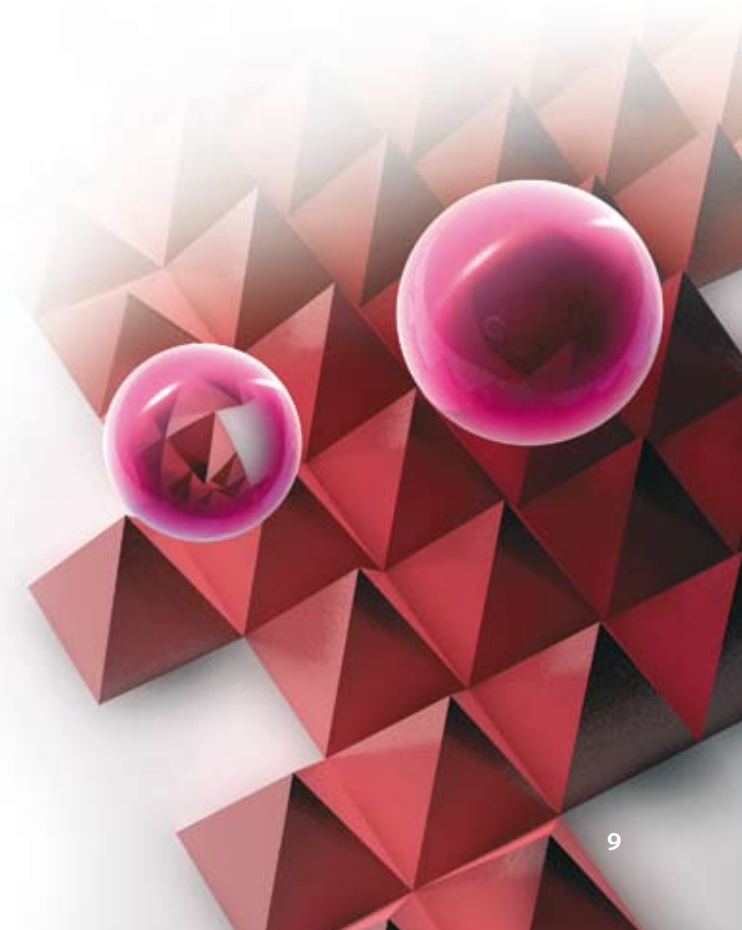
between these conditions, e.g. similar symptoms, co-morbid conditions (particularly psychological), history of abuse (sexual or physical) and similar behavioural responses to stress and pain.[14]

The four key components usually associated with chronic pelvic pain are:[15]

- Pain arising from the end organs (pelvic and lower abdominal)
- Central sensitisation of the nervous system
- The musculoskeletal response to pain
- The psychosocial consequences of the persistent pain

Many conditions associated either with specific pathology, a chronic pain syndrome, or components of both can produce or contribute to chronic pelvic pain (Table 1).

For further information, see: "The pharmacological management of endometriosis", BPJ 52 (Apr, 2013) and "Irritable bowel syndrome in adults", BPJ 58 (Feb, 2014).



Understanding chronic pain

The pathways which cause pain to persist after an injury appears to have healed are complex. A traditional definition of chronic pain might state that it is pain that continues for a longer time than expected for normal healing.[13] In some cases, healing or repair is never complete and persistent pain may be produced by scar tissue around nerves or a neuroma. Six months is defined as the cut-off point between acute and chronic pain.[13]

The pain cycle

Acute pain begins when nociceptors (pain receptors) are stimulated due to cellular disruption or trauma. The severity and duration of pain depends on the type and extent of injury. The physiological purpose of acute pain is to cause a decrease in the person's activity in order to protect the injured body part and promote healing.

Tissue injury, nerve damage, local inflammation and ongoing activation of nociceptors can cause pain sensitisation. As a pain stimulus transitions from an acute event to continuing stimulus, neuronal changes can occur both at the level of the primary afferent fibre (carrying signals from the nociceptors to the spinal cord) or from the spinal cord to the brain. The result of these changes is an amplified sensation of pain. In addition, neural changes in the spinal cord can result in non-nociceptive fibres causing a form of hyperexcitability so that sensory inputs which would not normally cause pain (i.e. normal touch or movement) result in a pain response.[16] This sensitisation results in the experience of chronic pain in the absence of injury.[16] It is not known exactly why pain sensitisation persists in some people, but it is influenced by variables such as:[3]

- Psychological status – emotional and behavioural states, mood, attentional focus, stress
- The autonomic nervous system – damaged afferent fibres can develop sensitivity to sympathetic stimulation
- The endocrine system – hormones released by the hypothalamic-pituitary-adrenal axis and sex hormones
- Genetics – having a close relative with a chronic pain syndrome increases risk
- Clinical history – a person with a previous or existing chronic pain syndrome is more likely to develop another

Referred pain is often a characteristic of chronic pelvic pain. Visceral (from the organs) and somatic (from the skin and muscles) nerves converge at the same point on the spinal cord – the central projection neuron. If visceral nerves are active for a long period of time (e.g. due to bladder pain), cross-sensitisation with the somatic nerves may occur where the brain has difficulty discerning where the pain is coming from and carries the pain back to the pelvic and abdominal muscles and skin.[17]

How can chronic pain be explained to patients?

When chronic pain occurs in the absence of pathophysiology, patients can feel their pain is not valid. It is important that the patient is reassured that the pain they are experiencing is real. A model has been developed to explain chronic pain to patients based on the sensitisation theory,[18] and adapted as follows:

"Imagine your body is a car and your pain system is a car alarm. When you first were injured, it was like a thief breaking into your car, which set off the car alarm. Once the thief leaves and the alarm is reset, there is no reason for it to keep going. But what if the alarm keeps getting set off again and again, but no one is breaking in? This means that the alarm is too sensitive, but it is still making the same sound (i.e. pain) as when the thief was breaking in.

This is what we think happens with chronic pain – some people's "car alarm", or pain system, becomes over-sensitive after originally being set off because the wiring of their system is faulty. The pain system gets confused and gets set off with things that shouldn't normally cause pain. This can happen at any time but is more likely if you have had a serious or long-lasting injury to begin with. An exacerbating factor is how you coped with the pain in the first instance and whether it was associated with stress or anxiety. Chronic pain can be reduced by learning to manage your stress and negative thoughts. In addition, good quality sleep and exercise help suppress the neuropathic pain pathways, which in turn improves your chronic pain. Exercise also reduces muscle tension and helps you feel more relaxed."

Part 2: Investigation and management of chronic pelvic pain

A multi-disciplinary approach to diagnosis, investigation and management is required

A multi-disciplinary approach to women with chronic pelvic pain aims to consider the possibility of the many aetiologies that may be producing the pain, and subsequent sequelae such as low mood and emotional, behavioural and sexual consequences.[2] Primary care is an ideal place to commence assessment of a woman with chronic pelvic pain; this is likely to require multiple consultations to cover all aspects of the condition.[19]

If a woman localises her pain to the pelvis it should not be immediately assumed that the origin of the pain is gynaecological. However, if a woman continually presents with pain and a cause has not been identified, always consider a new or undetected underlying organic cause. This is particularly important if the pain appears to be a new type of pain or is localised to a new site.

A first priority is to understand the pain that the woman is experiencing and how it is affecting her life. The aim should be to exclude "red flag" conditions (Page 13), determine if a specific aetiology is causing the pain, provide education and advice to enable the woman to begin to understand and self-manage the pain, initiate general management strategies including lifestyle changes and appropriate analgesia, and refer for further investigations and management if required.

Taking a comprehensive history is essential

A comprehensive history allows exclusion of conditions with specific treatment options, and promotes development of a therapeutic relationship, enabling education, increased understanding and ideally acceptance of the pain.[2, 20]

Tools like pain diaries and questionnaires that women can take home to complete can provide more detail than is possible to cover in a standard consultation. These tools help both the clinician and the woman understand her pain, as well as measuring symptom changes over time.

An example of a questionnaire for women with chronic pelvic pain is available from: **www.pelvicpain.org.au/wp-content/uploads/PPFA-Patient-Questionnaire-Women-2014.pdf**

The history should include questions about the woman's:[2]

- Pain
- Menstrual cycle
- Bowel and bladder function
- Sexual function (including any history of abuse)
- Level of functioning
- Co-morbidities
- Medicines

Pain

A detailed history of chronic pelvic pain may identify the underlying cause(s). Asking the woman what she thinks is causing her pain can provide valuable insight.

A useful mnemonic for pain history-taking is SOCRATES:[4, 15, 21]

- **S**ite – Where is the pain? If there is more than one site, is there a site of maximal pain?
- **O**nset – How long have you had the pain? Do you recall when the pain started? Was the onset associated with a preceding event such as childbirth or surgery? Pregnancy-related pain is often musculoskeletal (peripartum pelvic pain syndrome).
- **C**haracter – Visceral pain is typically dull and diffuse with a location that can be difficult to pinpoint. Nerve damage or nerve entrapment pain is usually burning, hot or electric shock-like.
- **R**adiation – Pain from the cervix, vagina or uterus often radiates to the lower back or buttocks. Pain from the ovaries or fallopian tubes may radiate into the medial thigh.
- **A**ssociations – Are there any symptoms or signs associated with the pain? e.g. with menstruation, sexual intercourse, urination, defaecation. Pain occurring with the symptomatic triad of sexual intercourse, menstruation and defaecation may be characteristic of endometriosis.
- **T**ime course – Is there a cyclical pattern? Endometriosis pain typically commences several days prior to menstruation and continues for the first day or two of menstruation. Pain that is worse at the end of the day and related to posture may be musculoskeletal or due to pelvic congestion syndrome.

- **E**xacerbating and relieving factors – e.g. any medicines or alternative remedies that may relieve the pain, or life events, sleep disruption, depression, anxiety or stress that may worsen the pain. Sensations such as touch or pressure from tight clothes that would normally not be painful may suggest allodynia from central sensitisation.
- **S**everity – Chronic pain varies over time, so a monthly pain diary may be useful. The use of a simple pain assessment score can enable comparisons to be made, which is useful when evaluating treatment efficacy.

Menstrual cycle

Establish what the woman's menstrual cycle is like; whether periods are regular, heavy or light, and whether they are associated with pain. Adenomyosis or uterine leiomyomas (fibroids) may cause heavy painful periods, although adenomyosis is typically more painful. Cyclical pelvic pain is usually hormonally driven, although other conditions may also worsen around menstruation, e.g. irritable bowel syndrome and bladder pain syndrome.

Bowel function

Is there a history of constipation, diarrhoea or bloating? Try to establish the relationship of the gastrointestinal symptoms to the pain, diet, stress, menstrual cycle and weight changes. Constipation is a common contributor to lower abdominal and pelvic pain.

Bladder function

Bladder pain syndrome is irritation of the bladder wall in the absence of infection. It is associated with polyuria (small frequent volumes), nocturia, urgency, and pain that gets worse as the bladder fills and better with micturition. It can also be associated with pain with intercourse. Recurrent urinary tract infection should be excluded.

Sexual history

Pain on initial penetration suggests vulvodynia or vaginal/pelvic muscle spasm, deep dyspareunia is associated with endometriosis, while post-coital pain can be a feature of pelvic congestion syndrome. Consider the effect that chronic pelvic pain is having on the woman's sexual relationship, as this may cause additional stress and low self and sexual confidence.

There is a complex relationship between chronic pain and a history of abuse. It is thought that childhood sexual abuse may predispose adults to develop chronic pain syndrome rather than having a direct causative effect.[2] Abuse as an adult, especially if this has continued since childhood, is associated with higher levels of pain-related disability and increased vulnerability.[22]

Level of functioning

Establishing a baseline level of function at the initial consultation can be valuable for developing and assessing a management plan. How is the pain affecting the woman's life? Can she do the daily activities that she wants? Are there any activities that she avoids? Is the woman employed and has she required time off work? Ask about exercise habits, caffeine and alcohol intake, smoking status, relationships, social support, stresses and coping mechanisms.

Co-morbidities

Women with chronic pelvic pain may also experience headaches, back pain, fibromyalgia, depression or anxiety. Ask specifically about sleep, fatigue, appetite, mood and social isolation.[4]

Medicines

Assess the effectiveness of current and past medicines including those for ovulatory suppression, neuropathic pain or other analgesic medicines. Consider medicine adverse effects which may be aggravating the pain, e.g. by contributing to constipation.

The role of physical examination

Observing the woman walk from the waiting room may provide insight as to the degree of pain, the origin of the pain and the current level of functioning.[23] Some women may appear distressed or anxious, or be tearful and distressed with the pain.

A focused examination of the lower back and buttocks, the sacroiliac joints and the symphysis pubis may reveal postural abnormalities, limitation of movements and areas of tenderness suggesting a musculoskeletal cause.

Assessment of the pelvic floor muscles is required. This involves both an external and internal examination primarily aiming to detect myofascial trigger points but also checking for ability to contract the pelvic floor. To palpate the pelvic floor muscles externally use one finger of a gloved hand and beginning at 12 o'clock gently palpate "around-the-clock" noting areas of tense bands of tissue, possible trigger points and areas of tenderness.[23] The pelvic floor muscles should then be assessed with an internal digital examination, using the same clock face pattern, checking for tone, trigger points and tenderness.[23]

Abdominal and pelvic examinations (bimanual and speculum) help identify areas of focal tenderness, the presence of any abdominal, uterine or adnexal masses, prolapse of pelvic organs, evidence of tethering or fixation of the uterus,

cervical excitation, and the presence or absence of cervical discharge.[2, 21]

Neuropathic testing is used to identify any altered areas of sensation over the lower abdomen and the perineum. Testing can initially be done using palpation with a finger (or a moistened cotton swab for the perineum); the arm or upper abdomen may be used as a baseline. Further testing can then be carried out using other stimuli as required, such as cold, hot or sharp. Areas of focal tenderness may be identified but the features that are likely to occur as a consequence of peripheral and central sensitisation and fit with a diagnosis of chronic pain are:[13]

- Allodynia – a painful response to a stimulus that is not normally considered painful
- Hyperalgesia – an increased response to a painful stimulus, e.g. hot, cold or sharp
- Sensory loss – a decreased or absent response to either non-painful or painful stimuli, e.g. soft, sharp, hot or cold

The role of investigations

The primary aims of investigations are to rule out infection and to detect the presence of any other underlying organic pathology.

Laboratory testing

Consider the following laboratory investigations:

- Swabs to rule out sexually transmitted infections, e.g. chlamydia and gonorrhoea, and pelvic inflammatory disease (see below)
- Cervical smear if due or if there is an abnormality on examination
- Urine sample (dipstick) to exclude pregnancy and urinary tract infection (culture may then be necessary)
- Blood tests including full blood count, creatinine and electrolytes and C-reactive protein (CRP).
  N.B. CA-125 is elevated in some ovarian cancers, endometriosis, pelvic inflammatory disease, renal failure and peritoneal inflammation. It is not recommended as a screening test for malignant disease.

All women who have chronic pelvic pain and are sexually active should have swabs to rule out a sexually transmitted infection.[2] There may be a clear history of an acute episode or repeated episodes of pelvic inflammatory disease, but the initial episode may have been asymptomatic and unrecognised. In some women chronic pelvic inflammatory disease is only detected when fertility is desired and the woman has been unable to conceive.

Ultrasound is the first line imaging tool

Ultrasound can help to detect pelvic pathology such as uterine leiomyomas, ovarian tumours and some endometriosis. Transvaginal ultrasound can improve the identification and diagnosis of adnexal masses and adenomyosis but has a limited role in detecting peritoneal endometriosis.[2]

Including all relevant clinical information on the ultrasound request form will assist the radiologist in producing a more accurate and helpful report. For example, a woman with deep dyspareunia and symptoms suggestive of endometriosis may have thickened uterosacral ligaments. Knowing the woman's presenting symptoms and signs will help direct the ultrasonographer in their assessment. Advise the woman if transvaginal ultrasound is required so that they are prepared for this examination.

Magnetic resonance imaging (MRI) may be considered for the detection of adenomyosis and other pelvic pathology but it is limited in its ability to detect endometriotic deposits.[2]

Red flags symptoms and signs[2]

Symptoms and signs that are recognised as red flags in women with chronic pelvic pain and require referral include:

- Rectal bleeding
- Irregular vaginal bleeding in a woman aged over 40 years
- Post-coital bleeding
- Onset of new bowel symptoms in a woman aged over 50 years
- Excessive or unexplained weight loss
- Onset of pelvic pain in a post-menopausal woman
- Pelvic mass

Referral may be required for surgical procedures

Many women with chronic pelvic pain will go on to have a diagnostic laparoscopy if no cause for their pain has been found. Women with cyclical pain should be prescribed a hormonal treatment for three to six months prior to having a laparoscopy, e.g. combined oral contraceptive or high-dose progestins to establish if suppression of ovulation results in an improvement in pain.[2,3] Diagnostic laparoscopy is the gold standard for the diagnosis of endometriosis and adhesions, although a cause for the pain will not be found in approximately one-third to one-half of all diagnostic laparoscopies.[2, 15] Negative findings

can be reframed in a positive light for patients, ruling out certain pathophysiological causes for their pain.

Multi-faceted treatment is recommended for chronic pelvic pain

Treatment should focus on the often complex contributory factors rather than on a single pathological process.[2] This type of approach enables appropriate treatment to be initiated when underlying conditions can be identified, but also aims to reduce unnecessary and repeated presentations, investigations, referrals and invasive procedures. Education, recognition and reassurance are important parts of the management strategy.[2]

Lifestyle modifications

Encourage natural pain modulating systems

The key pain modulating systems are sleep and exercise. Both of these factors can dampen down the activity in neural pain pathways.

Exercise – It is widely recognised that physical exercise produces symptomatic improvements in most patients with chronic pain, yet many of these patients do not exercise because of their pain.[24] Resting will not necessarily improve symptoms. A sedentary lifestyle also contributes to social isolation, low mood, reduced strength and range of motion and overall a lower level of function.[24]

Exercise:[24]

- Reduces pain
- Increases level of physical function
- Improves sleep
- Lessens fatigue
- Improves mood, depression and anxiety
- Reduces weight
- Mitigates inflammation

Physiotherapy can be valuable, particularly for women who have hypercontractility of the pelvic floor. Exercises which increase pelvic floor tone should be avoided as these can exacerbate pelvic floor hypercontractility.

Information on exercises to relax the pelvic floor is available online, e.g. **www.pelvicpain.org.au/information/women/yoga-poses-relax-pelvis/**

Sleep – a complex relationship exists between sleep, mood and chronic pain states. Evidence shows that:[25]

- Sleep dysfunction is likely to be a risk factor in the pathogenesis of chronic pain
- Pain causes sleep disturbance and poor quality sleep
- Sleep disturbance reduces the ability to cope with pain

Improving sleep quality and reducing sleep disturbance through increased exercise, effective sleep hygiene and the selective use of medicines can decrease chronic pain.

Encourage smoking cessation

Smoking is associated with higher levels of physical impairment and increased pain in patients with fibromyalgia.[26] A similar association is likely to be found in people with any chronic pain syndrome. Again, the relationship is complex due to:[26]

- High rates of smoking among people with chronic pain
- Smoking is an independent risk factor for chronic pain
- Pain can make people want to smoke
- An association with mood – higher rates of depression are reported in smokers with chronic pain and people who have depression cope less well with pain

Dietary modifications may help reduce pain

A high intake of fresh fruit and vegetables is known to decrease free radical/oxidative stress on the body and improve immune function.[8] In addition, many foods and fluids can contribute to chronic pelvic pain by irritating the bladder. Minimising the intake of caffeine, citrus fruits, spicy foods, carbonated drinks and alcohol may reduce bladder irritation.[27] A diet high in fruit, vegetables and fluid is likely to decrease the woman's risk of constipation while a low FODMAP diet may be beneficial if irritable bowel syndrome is contributing to chronic pelvic pain.

Prescribe appropriate analgesics

Prescribe paracetamol to be used on a regular daily basis rather than "as required", particularly if there is somatic pain.[3] NSAIDs are widely used for chronic pelvic pain and can be beneficial for some women, particularly if there is an inflammatory component to the pain.[3]

All opioids should be avoided as they can cause a paradoxical increase in sensitivity to pain, as well as the risks of addiction and tolerance.[3] All opioids, including codeine, are likely to cause constipation and potentially worsen pelvic pain.

Benzodiazepines should also be avoided.

For further information, see: "Helping patients cope with chronic non-malignant pain: it's not about opioids", BPJ 63 (Sep, 2014).

Adjuvant analgesics

Tricyclic antidepressants and gabapentin effect neuropathic or centrally mediated pain.[3] There is some evidence that these medicines may benefit patients with chronic pelvic pain.[28] Advise patients that adverse effects are common, but will lessen overtime. Aim to start with low medicine doses and build up slowly or as tolerated. There is insufficient evidence for the use of selective serotonin reuptake inhibitors (SSRIs) in patients with pelvic or neuropathic pain,[3] although some women may require treatment with these medicines for co-existing depression.

Tricyclic antidepressants (TCAs) have a long history of use in chronic pain (although this is an unapproved indication) and may provide relief.[3] Amitriptyline is the most frequently prescribed TCA for patients with chronic pelvic pain although nortriptyline may be better tolerated. Amitriptyline or nortriptyline can be started at 5–10 mg, nightly, and increased as tolerated to a maximum of 50 to 75 mg, occasionally higher.[3, 29] TCAs should be trialled for at least six to eight weeks as they can take some time to produce benefit. Constipation is a common adverse effect which needs to be avoided.

Gabapentin can provide analgesia more rapidly than a TCA but may cause adverse effects, such as tiredness, dizziness, nausea and weight gain. Gabapentin is subsidised with Special Authority approval for patients who have been diagnosed with neuropathic pain. Gabapentin is usually initiated at a low dose, e.g. 300 mg, nightly, and then increased gradually to twice daily then three times daily up to a maximum of 3.6 g daily,[29] although some guidelines suggest that 2.4 g per day in divided doses should be the maximum dose when treating women with chronic pelvic pain.[3]

Clonidine is occasionally used as an adjuvant analgesic medicine, although this is an unapproved indication.[29] It is typically prescribed as a transdermal patch when it is being trialled for relief of chronic pain. Clonidine can cause dry mouth, constipation and hypotension.

Botulinum toxin A injections can reduce muscle spasm in the affected pelvic floor muscles.[30] This provides relief for approximately three to six months, occasionally longer. Repeated injections may have a cumulative benefit. The success rate with these injections can be improved when they are undertaken in association with pelvic floor physiotherapy.

Final thoughts

The most important thing for women with chronic pain is for their pain to be validated. In the absence of an identifiable cause, it is essential to educate women that there is no one "magic bullet" that will resolve their pain. It is a journey that both doctor and patient will go on, with the hope of finding strategies to help cope with and minimise the pain over time.

Patient resources

The International Pelvic Pain society produces an educational document for women with chronic pelvic pain. It is available from: **www.pelvicpain.org/docs/patients/basic-chronic-pelvic-pain.aspx**

The Pelvic Pain Foundation of Australia also has an informative website designed for patients and their families. It can be found at: **www.pelvicpain.org.au**

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References

1. Birnbaum M. Chronic pelvic pain. Available from: www.infertilityphysician.com/publications/chronic-pelvic-pain/ (Accessed Aug, 2015).
2. Royal College of Obstetricians and Gynaecologists (RCOG). The initial management of chronic pelvic pain. RCOG, 2012. Available from: www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg41/ (Accessed Aug, 2015).
3. Engeler D, Barabowski A, Borovicka J, et al. Guidelines on Chronic Pelvic Pain. 2015. Available from: http://uroweb.org/wp-content/uploads/25-Chronic-Pelvic-Pain_LR_full.pdf (Accessed Aug, 2015).
4. Miller-Matero L, Saulino C, Clark S, et al. When treating the pain is not enough: a multidisciplinary approach for chronic pelvic pain. Arch Womens Ment Health 2015;[Epub before print].
5. Toye F, Seers K, Barker K. A meta-ethnography of patients' experiences of chronic pelvic pain: struggling to construct chronic pelvic pain as 'real'. J Adv Nurs 2014;70:2713–27.
6. Steele A. Opioid use and depression in chronic pelvic pain. Obstet Gynecol Clin N Am 2014;40:491–501.
7. Price J, Farmer G, Harris J, et al. Attitudes of women with chronic pelvic pain to the gynaecological consultation: a qualitative study. BJOG 2006;113:446–52.
8. Udoji M, Ness T. New directions in the treatment of pelvic pain. Pain Manag;3:387–94.
9. Latthe P, Latthe M, Say L, et al. WHO systematic review of prevalence of chronic pelvic pain: a neglected reproductive health morbidity. BMC Public Health 2006;6.
10. Ahangari A. Prevalence of chronic pain among women: An updated review. Pain Physician 2014;17:E141–7.
11. Grace V, Zondervan K. Chronic pelvic pain in New Zealand: prevalence, pain severity, diagnoses and use of the health services. Aust NZ J Pub Heal 2004;28:369–75.
12. Brawn J, Morotti M, Zondervan K, et al. Central changes associated with chronic pelvic pain and endometriosis. Hum Reprod Update 2105;20:737–47.
13. International Association for the Study of Pain. Classification of chronic pain, second edition (revised). 2011. Available from: www.iasp-pain.org/PublicationsNews/Content.aspx?ItemNumber=1673&navItemNumber=677 (Accessed Aug, 2015).
14. Matheis A, Martens U, Kruse J, et al. Irritable bowel syndrome and chronic pelvic pain: A singular or two different clinical syndrome? World J Gastroenterol;13:3446–55.
15. Evans S. Management of persistent pelvic pain in girls and women. Aust Fam Physician 2015;44:454–9.
16. Zeilhofer H, Wildner H, Yévenes G. Fast synaptic inhibition in spinal sensory processing and pain control. Physiol Rev 2012;92:193–235.
17. International Pelvic Pain Society. Chronic pelvic pain. 2014. Available from: http://pelvicpain.org/home.aspx (Accessed Aug, 2015).
18. Van Wilgen P, Keizer D. The sensitisation model to explain how chronic pain exists without tissue damage. Pain Manag Nurs 2012;13:60–5.
19. Quaghebeur J, Wyndaele J-J. Chronic pelvic pain syndrome: Role of a thorough clinical assessment. Scand J Urol 2015;49:81–9.
20. Fishbain D, Bruns D, Meyer L, et al. Do acute and chronic pain patients differ on affirmation of one aspect of pain acceptance? Acknowledgement that a cure is unlikely. Pain Physician 2015;18:E597–604.
21. Dick M-L. Chronic pelvic pain in women. Assessment and management. Aust Fam Physician 2004;33:971–6.
22. As-Sanie S, Clevenger L, Geisser M, et al. History of abuse and its relationship to pain experience and depression in women with chronic pelvic pain. Am J Obstet Gynecol 2014;210:317.e1–8.
23. Pastore E, Katzman W. Recognizing myofascial pelvic pain in the female patient with chronic pelvic pain. J Obstet Gynecol Neonatal Nurs 2102;41:680–91.
24. Ambrose K, Golightly Y. Physical exercise as non-pharmacological treatment of chronic pain: Why and when. Best Pr Res Clin Rheumatol 2015;29(1):120-30.
25. Choy E. The role of sleep in pain and fibromyalgia. Nat Rev Rheumatol 2015;[Epub ahead of print].
26. Goesling J, Brummett C, Meraj T, et al. Associations between pain, current tobacco smoking, depression, and fibromyalgia status among treatment-seeking chronic pain patients. Pain Med 2015;16:1433–42.
27. Friedlander J, Shorter B, Moldwin R. Diet and its role in interstitial cystitis/ bladder pain syndrome (IC/BPS) and comorbid conditions. BJU Int 2012;109:1584–91.
28. Cheong Y, Smotra G, Williams A. Non-surgical interventions for the management of chronic pelvic pain (Review). Cochrane Database Sys Rev 2014.
29. New Zealand Formulary. NZF v38. 2015. Available from: www.nzf.org.nz (Accessed Aug, 2015).
30. Adelowo A, Hacker A, Shapiro A, et al. Botulinum toxin type A (BOTOX) for refractory myofascial pelvic pain. Female Pelvic Med Reconstr Surg 2013;19:288–92.

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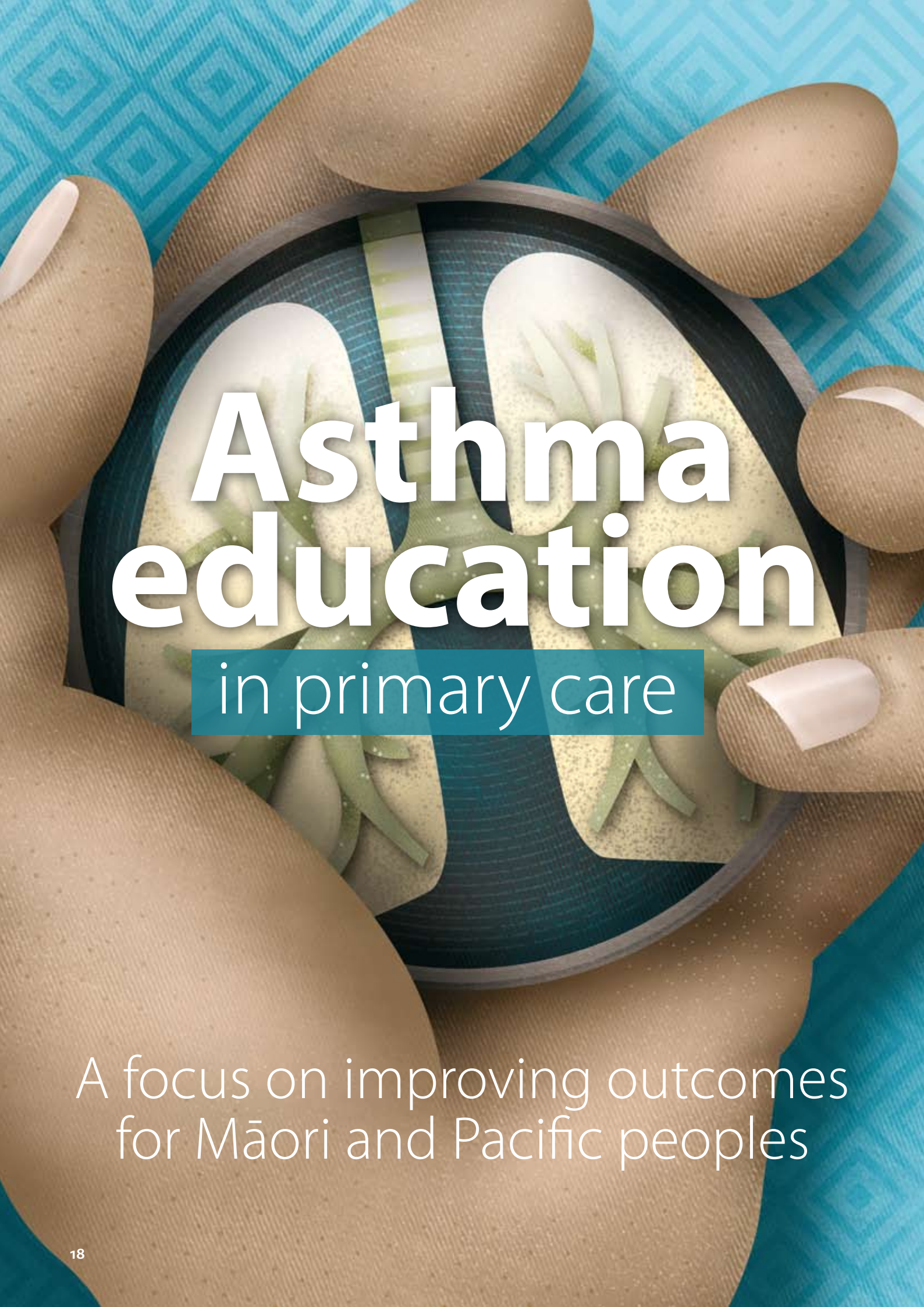


Asthma education

in primary care

A focus on improving outcomes for Māori and Pacific peoples

Māori and Pacific peoples in New Zealand are disproportionately affected by asthma, but the level of care they receive does not match this morbidity. Education helps to reduce disparities and needs to be an ongoing component of asthma care. To be effective, asthma education needs to be matched to the stage of asthma health literacy of the patient and their whānau. Patients with asthma who are supported by a collaborative primary care team do experience better health outcomes. Regular follow-up of all patients with asthma ensures that Māori and Pacific patients are receiving appropriate treatment and that any gaps in care can be rapidly redressed.

Key practice points:

- Develop a collaborative approach to asthma care in your practice so that consistent messages are delivered to patients and each team member knows who is doing what
- Focus on expanding one aspect of the patient's or whānau understanding of asthma at every consultation – asthma education is an ongoing process
- Ensure that information about asthma is delivered in a way that is matched to the stage of health literacy of the patient and their whānau. Always check that the key points have been understood as intended.
- Regularly review asthma symptom control and try to make time for patients and families to discuss asthma and create shared goals of care

The burden of asthma in New Zealand

Asthma places a heavy burden on New Zealand communities. One in seven New Zealand children and one in nine people in New Zealand aged over 15 years are prescribed some form of asthma medicine.[1] From July, 2012 to June, 2013, more than 4200 people aged under 20 years were admitted to hospital for asthma.[2] Asthma mortality rates in New Zealand are still higher than in other high-income countries in North America, Australasia or Europe;[3] on average more than one person in New Zealand dies each week due to asthma.[4]

Māori and Pacific peoples and those living in low socioeconomic areas are most affected

Māori and Pacific peoples are more severely affected by asthma. Asthma is 1.5 times more common among Māori than non-Māori, with one in six Māori surveyed in New Zealand taking some form of asthma medicine.[1] Māori are almost three times, and Pacific peoples over 3.5 times, more likely to be hospitalised due to asthma than people of other ethnicities in New Zealand.[4] During the period 2006 - 2011, the mortality rates due to asthma per 100, 000 people in New Zealand were 5.4 for Māori and 6.5 for Pacific peoples, compared to 1.1 for people of non- Māori, non-Pacific or non-Asian ethnicity.[4]

People living in the most deprived areas of New Zealand are more severely affected by asthma. In these areas, one in seven adults surveyed reported taking a medicine for asthma; a rate 1.6 times higher than adults living in the least deprived areas once age, sex and ethnic differences are accounted for.[1] Asthma mortality rates are over three times higher in the most deprived areas of New Zealand compared to the least deprived.[4] The reasons for this increased severity of asthma in lower socioeconomic areas are likely to be multi-factorial but contributing factors may include: dampness and mould in the home,[5] inadequate home heating, and an increased rate of maternal smoking in deprived communities. The DHB areas with the highest rates of hospitalisation due to asthma are Auckland, Counties Manukau, Bay of Plenty, Hutt and Whanganui.[4]

There is a gap in asthma care

The level of care Māori and Pacific peoples with asthma in New Zealand receive does not match their burden of disease. Despite having a higher prevalence and severity of asthma Māori and Pacific children are less likely to have their treatment escalated, and are more likely to use oral steroids to control asthma exacerbations; suggesting less frequent use of primary care services until symptoms become severe.[6] He Māramatanga Huangō: asthma health literacy for Māori children in New Zealand, is a report that found that caregivers of Māori and Pacific children are less likely to receive information that allows them to make appropriate health decisions to manage asthma than caregivers of non-Māori and non-Pacific children (see: "Key findings of He Māramatanga Huangō", Page 21).[7]

Poor asthma literacy affects the perception of asthma control

Health literacy is not a measure of intelligence nor is it the same as literacy. Health literacy means the degree to which individuals have the capacity to obtain, process and understand basic health information and services in order to make informed and appropriate health decisions.[7]

Many people in New Zealand are limited in their ability to make informed health decisions due to difficulties receiving, processing and understanding the required information.[8] Amongst Māori, 75 – 80% of adults are reported to have poor health literacy.[7] Poor asthma literacy is likely to contribute to asthma disparities in New Zealand as it is associated with reduced self-efficacy and reduced use of asthma medicines.[7]

It is the responsibility of health professionals to ensure that health information is delivered to patients and families in a form that is understandable. This requires an appropriate degree of cultural competency. Culturally appropriate models of asthma care improve patient outcomes.[9] However, when people or families do not understand what good asthma management is, not only do they not receive quality care, but they are more likely to accept poor asthma control as normal. The Patient Outcomes Management Survey (POMS) of 445 primary care patients in New Zealand with asthma found that people with asthma often accept sub-optimal asthma control; 71% of adults had asthma that was not well-controlled according to asthma guidelines, although 76% thought their asthma was well-controlled and 80% were satisfied with their level of control.[10] It was also found that 40% of children with asthma had missed school in the previous 12 months due to asthma.[10]

Making asthma education a priority at your practice

Asthma self-management requires a good understanding of the condition and how it is managed. Improving this understanding through education is one of the most important things primary care clinicians can do to support patients with asthma and improve outcomes. A Cochrane review found that programmes that focus on improving asthma self-management in adult patients result in reduced hospitalisations, emergency department visits, unscheduled doctor's visits and nocturnal symptoms, and an improved quality of life.[11]

Asthma education involves increasing the patient's knowledge in a stepwise approach at every point of contact.[7] To do this effectively health professionals need to base the progression of learning on existing knowledge while taking into account the severity of the patient's asthma, current treatments, age and maturity, e.g. is the patient an adult or a child with caregivers present? The initial consultation could focus on "things to do", e.g. how to correctly use a metered dose inhaler (MDI) with a spacer. Once this has been established the focus can shift to recognising worsening asthma and implementing individualised action plans.

Making time for asthma education

If patient education is not prioritised general practitioners often only see patients with asthma when they are experiencing troublesome symptoms. If possible, time should also be scheduled to allow patients to talk about asthma. Cost may be a barrier for some families, but this time is important as it allows health professionals to target their delivery of asthma education to gaps in the patient's knowledge. The need to ensure that asthma education is not a one-off experience was identified as the most critical element in asthma education by almost 700 health professionals in New Zealand involved in asthma care.[7]

Forming a collaborative team

Many general practitioners in New Zealand rely on either practice nurses or pharmacists to demonstrate the use of spacers, although most nurses and pharmacists think that this is being performed by general practitioners.[7] Furthermore, patients often experience asthma exacerbations outside of normal hours and are treated by after-hours care providers, which can reduce continuity of care. It is a good idea to document in the patient's notes what has and has not been discussed with the patient. The person who is responsible for reviewing asthma care, e.g. the asthma champion (see below), can then easily identify any gaps in patient education that need to be addressed.

An asthma champion can co-ordinate asthma care

Consider nominating a staff member as "asthma champion", e.g. a practice nurse, to take responsibility for the uptake and implementation of asthma best practice. An asthma champion may also be responsible for checking that each patient with asthma is receiving regular follow-up (see: "Regular review is recommended, Page 25) as well as identifying patients with asthma with the greatest unmet need who will benefit the most from more intensive support.

Community pharmacists can support asthma education

Community pharmacists are well placed to support and

Key findings of He Māramatanga Huangō

The He Māramatanga Huangō (Understanding Asthma) research project was commissioned by the Ministry of Health and the Asthma Foundation of New Zealand.[7] The project examined the health literacy demands on both whānau affected by asthma and health providers involved with asthma management. It also identified barriers to improve asthma literacy and made recommendations to improve health literacy and asthma outcomes. A panel of 14 asthma experts was involved in the project and a national online survey was completed by 800 health professionals with a role in asthma management. In-depth interviews were also held with a range of health professionals and whānau with a child with asthma. Sixteen points were identified that would help primary care improve asthma outcomes for children and young people in New Zealand. These were divided into four realms:[7]

Mātauranga (Knowledge):

1. Maintain a high level of competency in current best practice for the management of childhood asthma
2. Ensure all children have access to individualised, understandable asthma action plans
3. Follow a step-wise education plan when providing asthma support to Māori patients
4. Provide updated electronic access to asthma plans for whānau, community health workers and schools
5. Routinely utilise specialist (medical and/or nursing) respiratory and paediatric expertise to effectively manage those whānau with complex health-care needs

Whakaakoako (Teaching Strategies):

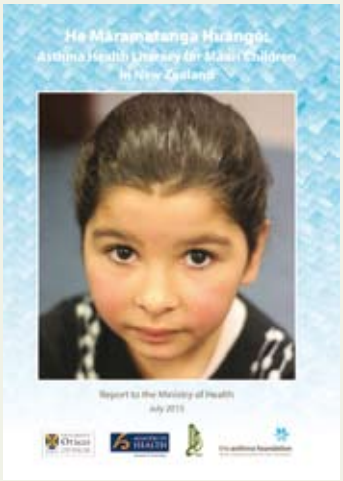
6. Ensure all consultations are seen as opportunities to build health literacy, promote patient activation and support asthma self-management
7. Undertake specific training in the use of health literacy-based education techniques
8. Regularly incorporate a variety of learning media (e.g. interactive/tactile/audio-visual asthma resources) to support asthma education
9. Continue to develop cultural competency skills for engaging with Māori children and whānau

Whakawhanake (Workforce Development):

10. Maintain continuous high-quality relationships to build long-term trust relationships with patients
11. Routinely explore the manageability of asthma management plans and utilise relevant support services to address identified barriers
12. Develop collaborative partnerships with Māori health providers, Whānau Ora providers and other community-based organisations in support of asthma care for Māori children

Te Anga (Model of Care):

13. Routinely incorporate chronic care management approaches into asthma consultations, including proactive strategies to provide preventive advice when patients are well
14. Ensure follow-up visits are provided subsequent to acute presentations/hospitalisation
15. Provide access to asthma self-management support after-hours via the internet or telephone
16. Ensure all children with asthma are offered support packages when eligible (e.g. Care Plus, Disability Allowance, Whānau Ora services)



This research report can be obtained from the asthma foundation website. See: **www.asthmafoundation.org.nz/wp-content/uploads/2015/07/Asthma-Health-Literacy-Report.pdf**

deliver asthma education as they often see patients more frequently than general practitioners. Repetition of the key asthma messages in different ways, from multiple sources is recommended to improve asthma education.

Asthma education begins at diagnosis

Children who are likely to have asthma are usually identified at a relatively young age but not formally diagnosed with asthma until later because transient wheeze is often associated with upper respiratory tract infections (URTI).[12] Children aged under five years can be expected to have six to eight URTIs a year.[12] In young children diagnosing asthma is also complicated by the difficulty of assessing airflow limitations. Where there is diagnostic uncertainty health professionals need to be clear with families about the diagnostic methods being used to define the condition. It may be appropriate to discuss any of the following with a patient and their whānau where a diagnosis of asthma is suspected:

- The need to establish a pattern of recurrent wheeze to confirm a diagnosis
- The reasons for trialling a short-acting beta-agonist (SABA), i.e. to demonstrate reversibility and to relieve wheeze
- The role whānau can play by monitoring symptoms and/or recording peak flow recordings

Clear communication with whānau throughout the diagnostic process prevents families from falling into a "diagnostic limbo" because they have not been categorically told that their child has asthma. A lack of diagnostic certainty among whānau was identified as a common problem in the He Māramatanga Huangō report.[7]

For further information on asthma in children, see: "Diagnosing and managing asthma in children", BPJ 42 (Feb, 2012).

Asthma diagnosis and management recommendations are being revised

New Zealand asthma guidelines are currently being revised. An update on the pharmacological management of asthma will be published in BPJ once new guidelines have been released.

Assessing the patient's knowledge of asthma

Some patients or whānau may feel too embarrassed (whakamā) to ask questions or to admit they do not understand certain concepts during a consultation. Therefore, having a good understanding of the patient's level of knowledge of asthma is critical before discussing the diagnosis. A good way of doing this is to ask: "*Has anyone talked to you about what asthma is?*" If the answer is yes, then ask the patient or whānau to tell you what they have been told, so that time is not spent repeating information they already know. This allows for existing information to be acknowledged, and reinforced, and is likely to uncover any misconceptions. Incorrect beliefs should be addressed because patients may not accept new information if it does not fit with what they already know.

Once the level of knowledge and health literacy has been assessed subsequent discussions can be delivered appropriately. Asthma education should always be supportive and should never be interpreted by the patient or whānau as being a test.

Using language that is appropriate for the patient

Health professionals who communicate well with patients avoid the use of jargon and use terms that are familiar. For example, it may be appropriate to use words such as puffer or pump rather than inhaler (Table 1) and to avoid abbreviations such as MDI. Using terms that the patient or whānau have used themselves demonstrates attentiveness and builds a common language.

Techniques to improve patient comprehension

There are several techniques that can be used to improve understanding of information during discussions with patients, including:[12]

- Limiting information to three or four points and making the most important points first; if more points need to be discussed then arrange another consultation
- Using illustrative analogies, e.g. "T*aking your preventer medicines regularly is like watering a garden. If you wait until the plants are wilted it's too late: just like plants need water every day, you need medicine every day.*"
- Presenting a scenario and asking why the situation might be occurring and what they might do about it, e.g. the patient notices their chest tightening after flowers have been brought into the house
- If whānau are present then it is important to include them in the planning and discuss with them how they can support the implementation of the plan
- Communication techniques, e.g. teach back, are essential to confirm comprehension, e.g. "*I've given you a lot of information today and I just want to be sure I haven't missed anything. Perhaps you could tell me how often you will be using the orange inhaler when you get home.*"

Table 1: Glossary of selected medical terms and patient-centred alternatives frequently used in asthma care

Medical term	Patient-centred term
Airway hyper-responsiveness	Narrowed breathing tubes/airways
Alveoli	Tiny breathing sacs deep in the lungs
Bronchi	Breathing tubes/airways
Chronic or long-term	Present everyday
Exacerbation	Flare up or attack
Inhaled corticosteroid (ICS), steroid/long- acting beta-agonist (LABA) inhaler	Preventer, controller
Inflammation of airways	Breathing tubes becomes swollen, puffy and narrow
MDI inhaler	Puffer, pump
Reversibility	Return to normal
Short-acting beta-agonist (SABA)	Reliever, quick relief medicine, rescuer, blue puffer
Triggers	Things that make asthma worse or cause an attack
Wheeze	Heaving, whistling, tight chest

Explain what will happen next

Once one aspect of asthma education has been covered explain to the patient what will happen next, e.g. "*Today we talked about taking your preventer puffer every day. Next time you come in I want to make a plan with you about what to do when you find yourself getting wheezy.*" This avoids confusion and allows patients to plan for and participate in the next stage of asthma management.

Discussing asthma treatment

The clinical goals of asthma management are to provide all patients with:[12]

1. Good symptom control without any adverse effects from treatment
2. Minimal exacerbations and airway limitations

The patient's personal goals should also be addressed whenever asthma management is discussed and included as shared goals of care, e.g. being able to play sport or not to be woken by wheeze during the night.[12]

Control-based management of asthma

A control-based model of asthma management is recommended as this is associated with improved outcomes for patients.[12] This involves a cycle of ongoing assessment, treatment and review.[12] As part of this process the patient's likelihood of experiencing an asthma exacerbation should be regularly assessed as well as any avoidance strategies the whānau has in place (Table 2, over page).

Explain the "why" as well as the "how"

Whānau providing care for a child who has asthma often have a good understanding about how to perform tasks, e.g. using a peak flow meter, but this does not necessarily equate to an understanding as to why a task is being performed.[7] In He Māramatanga Huangō it was found that whānau are confident in their understanding of the use of reliever medicines, but their understanding of preventer medicines is less certain.[7] Only 10% of families with a child who had asthma "mostly" or "completely" understood the role of preventer medicines in asthma management.[7] Misunderstanding the role of preventer medicines is a barrier to good asthma control

Table 2: Risk factors for asthma exacerbations and asthma trigger avoidance strategies[12, 13, 14]

Risk factors for asthma exacerbations:
■ Uncontrolled asthma symptoms ■ A history of ≥ 1 exacerbations in the previous year ■ Poor adherence to treatment ■ Incorrect inhaler technique ■ Cigarette smoking or exposure to second-hand smoke ■ Viral respiratory infections ■ High use of SABA – there is an increased risk of death if the patient is using more than one 200-dose SABA inhaler a month ■ Failure to escalate treatment according to guidelines ■ Significant psychosocial problems, e.g. psychosis, alcohol/drug misuse, financial or employment problems and learning difficulties ■ Allergen exposure for patients who are sensitised ■ Co-morbidities, e.g. obesity, rhinosinusitis, confirmed food allergy ■ Pregnancy, particularly during the second trimester ■ Sputum or blood eosinophilia
Lifestyle measures to avoid asthma triggers:
■ Making the home and vehicle smoke-free ■ Adequate home-heating and insulation, while avoiding the use of open fires or gas heaters that are not externally vented ■ Annual influenza vaccinations and pneumococcal vaccinations for children at high risk of pneumonia, e.g. children whose asthma is treated with high-dose corticosteroids ■ Keeping windows closed when pollen counts are high ■ Staying indoors in smoggy weather ■ Regular vacuuming to reduce dust mites, although this may be best performed when the patient with asthma is out of the house as allergens can become aerosolised ■ Avoiding freshly cut grass ■ Avoiding having pets, or at least keeping bedrooms pet-free and if possible bathing pets frequently

that it is important to overcome.[7] Among over 700 health professionals involved in the treatment of asthma, the correct use of asthma medicines and devices was identified as a high priority in asthma education.[7]

The importance of education about asthma preventer medicines emphasises the need to be clear within the primary care team who is delivering what information and when, to ensure patient education does not slip through the cracks.

Regular review is recommended: could this be a role for the asthma champion?

Ideally patients should be followed-up one to three months after starting treatment for asthma and every three to 12 months thereafter.[12] Asthma reviews should be scheduled during periods when the patient's symptoms are well controlled. Asthma reviews are particularly important in Māori and Pacific children who are less likely than other children to have their treatment escalated.[6] A follow-up should be arranged within one week of a patient experiencing an exacerbation.[12]

Scheduling an asthma review provides patients and whānau with a chance to discuss any aspect of asthma. This is also an opportunity for practices to confirm that consistent messages are being delivered to patients. The discussion can be initiated by an open-ended question such as: "*How are you feeling about your asthma at the moment?*" The specifics of the patient's symptoms can then be discussed, e.g. night-time waking or exercise limitations.

Patients need to be prepared for exacerbations

Asthma action plans are associated with reduced hospitalisations;[11] if a patient is able to increase their inhaled corticosteroid dose (ICS) dose early during an exacerbation they are less likely to have a severe exacerbation.[12] Action plans include instructions on when and how to make short-term adjustments in treatment in response to worsening symptoms and when to access additional medical care.

The criteria for patients with asthma to increase their dosing of preventer medicine may vary depending on the individual. An example would be for a patient to double their ICS dose if they are finding it difficult completing daily activities or, if they are using a peak flow meter, if their peak expiratory flow (PEF) decreases by more than 20% for more than two days.[12] If an increase in ICS dosing does not provide symptom relief the patient should contact a member of the primary care team.

Tools to create asthma action plans

The Pictorial Asthma Medication Plan (PAMP) has been validated for use in Pacific children and is available online (see below) and in Te Reo and Pacific languages.[15]

The *bestpractice* electronic decision support module "Childhood asthma" produces printed action plans for patients and is nationally funded and freely available to all general practices in New Zealand. When the "Childhood Asthma – Action Plan" module is selected the action plan will be automatically populated with the patient's details, including any asthma medicines that have been prescribed and any peak flow recordings that have been made. The patient's asthma triggers can be selected from a menu, and if oral corticosteroids are required, a dose will be automatically calculated based on the patient's weight. Asthma action plan review dates can also be selected and all information that is entered will be automatically written back to the patient management system.

For further information on PAMP, see: **www.pamp.co.nz**

For further information on the *bestpractice* Asthma module, see: **www.bestpractice.net.nz**

Asthma action plans for adults are also available online from:

www.asthmafoundation.org.nz/wp-content/uploads/2012/03/AsthmaSelfManagementPlan08_final.pdf

Exploring barriers to good asthma control

Many whānau do not realise that asthma is a long-term condition, requiring preventative treatments even when well.[7] This misunderstanding is reinforced by a model of asthma care where patients generally only discuss the condition with health professionals following an acute deterioration in symptoms. Poor treatment adherence is associated with poor asthma control and should be assessed in a non-judgemental way. For example: "*It's difficult to remember to use your preventer inhaler every day. How many days a week do you think you are using your preventer?*"

If patients acknowledge that they do not take preventative medicines regularly, describing the benefits that the daily use of preventer medicines provide may improve adherence. For example, improving fitness so that sports practice and games do not have to be missed.

If forgetfulness is a reason for treatment non-adherence then this may be overcome by linking administration of asthma preventer medicines with another routine daily activity, or setting a reminder on a cell phone.

Confirm that inhaler technique is appropriate

Incorrect inhaler technique can contribute to poor asthma control and should be assessed regularly.[12] Up to 80% of patients in the community are reported to use their inhalers incorrectly.[12] The patient's inhaler technique can be assessed by asking "*Inhalers are a bit like toothbrushes and we all get into bad habits when using them, can you show me how you use your inhaler?*" Spacers are recommended for all patients with pressurised asthma inhalers as they make it easier for patients to use the inhaler and improve medicine delivery.[12] Inhaler maintenance may also be discussed, e.g. the importance of regularly washing spacers with warm water and detergent then allowing them to air dry to reduce static charge.*

* From 1 November, 2015, three spacer devices will be listed on the Pharmaceutical Schedule: Apex Medical's e-chamber Turbo 220 mL (ideal for children aged under five years) and La Grande 510 mL spacers as well the e-chamber paediatric mask for spacer devices (suitable for children of all ages). As these spacers have antistatic properties there will be no need to prime these devices.

Revisit the patient's action plan

If a patient is experiencing less than optimal symptom control, revisit their action plan and ensure that it is appropriate. To confirm that the patient and whānau understands the action plan ask an open-ended question, e.g. "*Can you tell me what you usually do when your child wakes up in the night with a wheezy chest?*" Reiterate the importance of avoiding triggers for exacerbations and taking all reasonable steps to avoid them.

Concerns about the adverse effects of treatment can reduce adherence

Concern about possible adverse effects associated with the daily use of ICS may be a reason for non-adherence with asthma preventer treatment.[7] Confusion about the differences between oral or ICS may be another cause for concern in patients being treated with asthma. Some patients may link ICS use with the adverse effects experienced by people who misuse anabolic steroids.

Patients with asthma can be reassured that the majority of people who are treated do not experience any noticeable adverse effects due to ICS use. The use of spacers with pressurised inhalers improves the delivery of medicine directly to the lungs, therefore reducing the amount required to microgram doses. Good inhaler technique or the use of spacers by patients taking ICS also reduces the risk of dysphonia and oral candidiasis, and this risk can be further reduced by rinsing the mouth and spitting after taking the ICS.[12]

Further educational resources are available

The Asthma Foundation has educational resources for patients and families that are useful for explaining what asthma is and how asthma can be controlled effectively. These include Te Ha Ora Huango (asthma posters), and an illustrated book in which a cartoon Maui takes control of his asthma with the help of his tupuna (ancestors).

For further information, see: **http://asthmafoundation.org.nz/education/for-health-professionals/useful-resources/**

The Health Quality and Safety Commission (HSQC) provides a resource "Three steps to better health literacy".

For further information, see: **www.hqsc.govt.nz/our-programmes/partners-in-care/work-streams/health-literacy/**

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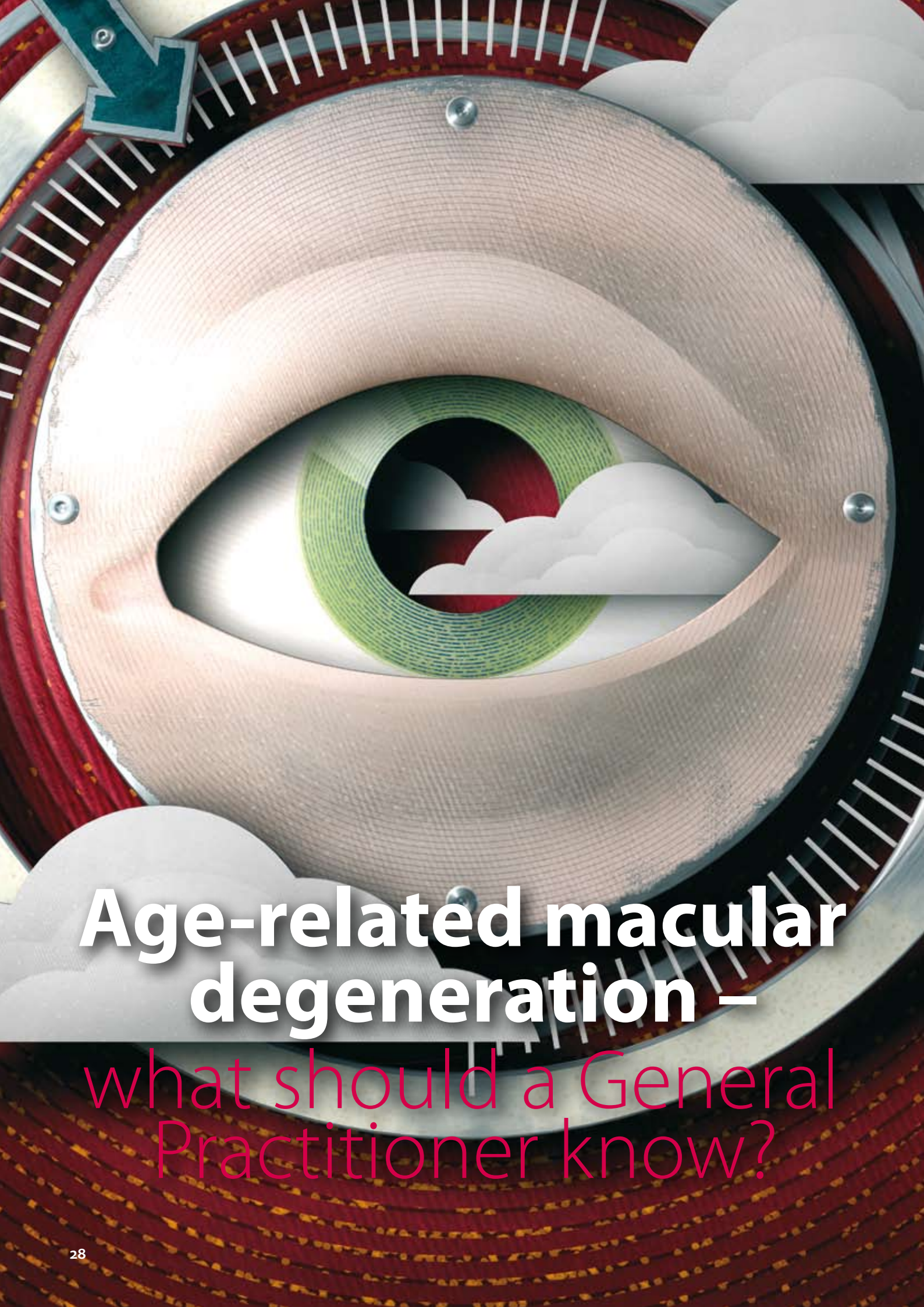
References

1. Ministry of Health. New Zealand Health Survey: Annual update of key findings 2012/13. Wellington, New Zealand: Ministry of Health, 2013. Available from: www.health.govt.nz/publication/new-zealand-health-survey-annual-update-key-findings-2012-13 (Accessed Sep, 2015).
2. Ministry of Health (MoH). Publicly funded hospital discharges - 1 July 2012 to 30 June 2013. 2015. Available from: www.health.govt.nz/publication/publicly-funded-hospital-discharges-1-july-2012-30-june-2013 (Accessed Sep, 2015).
3. The Global Asthma Network. The Global Asthma Report 2014. 2015. Available from: www.globalasthmareport.org/resources/Global_Asthma_Report_2014.pdf (Accessed Sep, 2015).
4. Barnard L, Baker M, Pierse N, et al. The impact of respiratory disease in New Zealand: 2014 update. Asthma and Respiratory Foundation of New Zealand, 2015. Available from: http://asthmafoundation.org.nz/wp-content/uploads/2012/08/2015-Respiratory-Impact-Report.pdf (Accessed Sep, 2015).
5. Weinmayr G, Gehring U, Genuneit J, et al. Dampness and moulds in relation to respiratory and allergic symptoms in children: results from Phase Two of the International Study of Asthma and Allergies in Childhood (ISAAC Phase Two). Clin Exp Allergy 2013;43:762–74.
6. Gillies TD, Tomlin AM, Dovey SM, et al. Ethnic disparities in asthma treatment and outcomes in children aged under 15 years in New Zealand: analysis of national databases. Prim Care Respir J 2013;22:312–8.
7. Jones B, Ingham T, Reid S, et al. He Māramatanga Huangō: Asthma Health Literacy for Māori Children in New Zealand. 2015. Available from: http://asthmafoundation.org.nz/wp-content/uploads/2015/07/Asthma-Health-Literacy-Report.pdf (Accessed Sep, 2015).
8. Ministry of Health (MoH). Korero Marama: Health Literacy and Māori Results from the 2006 Adult Literacy and Life Skills Survey. MoH, 2010. Available from: www.health.govt.nz/system/files/documents/publications/korero-marama.pdf (Accessed Sep, 2015).
9. Li P, Guttmann A. Recent innovations to improve asthma outcomes in vulnerable children. Curr Opin Pediatr 2009;21:783–8.
10. Holt S, Kljakovic M, Reid J, et al. Asthma morbidity, control and treatment in New Zealand: results of the Patient Outcomes Management Survey (POMS), 2001. N Z Med J 2003;116:U436.
11. Gibson PG, Powell H, Coughlan J, et al. Self-management education and regular practitioner review for adults with asthma. Cochrane Database Syst Rev 2003:CD001117.
12. Global Initiative for Asthma (GINA). Global strategy for asthma management and prevention. GINA, 2015. Available from: www.ginaasthma.org (Accessed Sep, 2015).
13. Sturdy PM, Victor CR, Anderson HR, et al. Psychological, social and health behaviour risk factors for deaths certified as asthma: a national case-control study. Thorax 2002;57:1034–9.
14. Zipkin R, Schrager SM, Keefer M, et al. Improving home management plan of care compliance rates through an electronic asthma action plan. J Asthma 2013;50:664–71.
15. Kristiansen J, Hetutu E, Manukia M, et al. An evaluation of a pictorial asthma medication plan for Pacific children. N Z Med J 2012;125:42–50.



Age-related macular degeneration – what should a General Practitioner know?

Age-related macular degeneration is a progressive condition which results in loss or distortion of the central visual field, and is the leading cause of blindness in New Zealand. Key risk factors for the development of age-related macular degeneration are age and family history, but people can reduce their risk by avoiding smoking, consuming a diet with a variety of fruits and vegetables and regular fish intake, and avoiding exposure to UV light. Prognosis has dramatically improved for some people with age-related macular degeneration, as treatment with anti-vascular endothelial growth factor antibodies can stabilise vision loss and improve visual acuity. For people in the early stages of disease, dietary supplements may be beneficial to reduce the risk of progression.

Key practice points:

- Age-related macular degeneration is one of the principal causes of blindness in older people in New Zealand
- Age and family history are key risk factors, along with smoking; smoking cessation is the most important step patients can take to reduce their risk
- Early disease is asymptomatic, but can be detected on eye examination. Patients aged over 45 years should be encouraged to have their eyes checked by an optometrist. General practitioners can conduct visual acuity testing and direct fundoscopy to check for changes.
- New anti-VEGF intravitreal injections are highly effective at reducing vision loss in patients with neovascular ("wet") age-related macular degeneration
- Lifestyle changes to reduce the rate of progression in patients with age-related macular degeneration include smoking cessation, avoiding UV light, including fruits, vegetables and fish in the diet and considering dietary supplements, particularly containing lutein and zeaxanthin

Age-related macular degeneration is a progressive disease which can lead to diminished visual acuity and loss of central vision (Figure 1). It is one of the principal causes of blindness. In advanced disease people retain their peripheral vision but are legally blind due to a loss of central vision.[1] Age is a key risk factor, and increases in prevalence are expected worldwide as populations become progressively older. The development of effective sight-saving treatments for neovascular (wet) age-related macular degeneration in recent years has improved outcomes for patients, but has significantly increased ophthalmology resource demands.

In New Zealand, it is estimated that age-related macular degeneration accounts for 48% of cases of blindness among adults aged 50 years and older, and causes an estimated 400–500 new cases of blindness per year.[2, 3] The prevalence of age-related macular degeneration in New Zealand is uncertain due to a lack of appropriate studies but it was estimated in 2014 that it affected 10% of people aged 45 – 85 years, and 38% of people aged over 85 years.[4] The risk of age-related macular degeneration appears to be equal between males and females.[5] There are no reliable estimates of prevalence by ethnicity in New Zealand, however, Māori are known to have higher rates of vision loss from any cause.[2, 4]

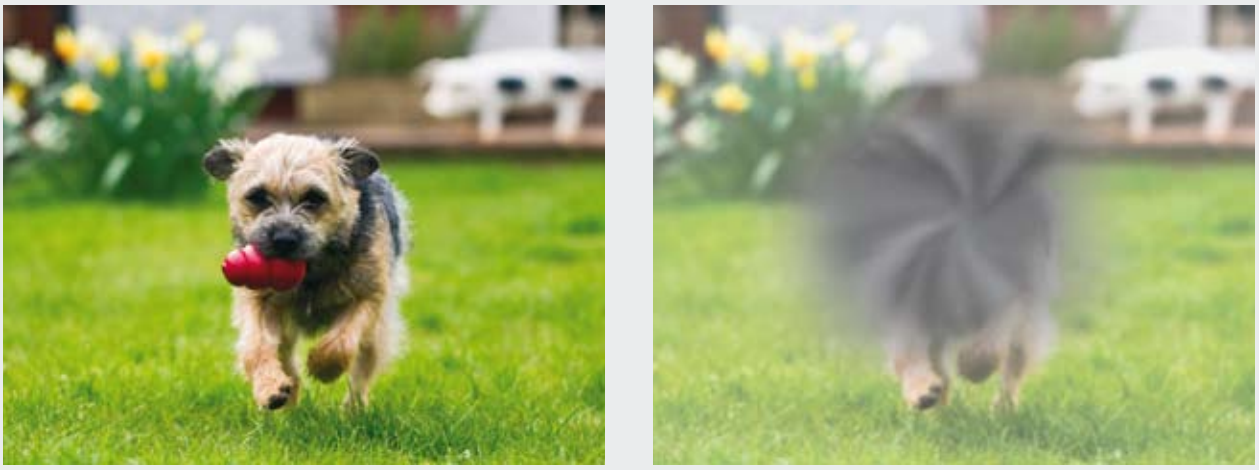


Figure 1: Visual changes characteristic of age-related macular degeneration

People with age-related macular degeneration may experience little impact on their daily life in early stages of disease, but considerable changes in their quality of life, independence and relationships with advanced disease. The rate of progression is highly variable, but most visual loss occurs once the disease has progressed to "late" age-related macular degeneration (see below).[6] People with age-related macular degeneration have an increased risk of depression and are likely to experience anxiety about progression of their condition and future vision loss.

Most of the treatment of age-related macular degeneration is carried out by ophthalmologists. Primary care clinicians have a key role in the identification of patients for referral, counselling patients on preventive measures such as smoking cessation, a healthy diet and dietary supplements, and assisting patients in managing the effects and psychological sequelae of their condition.

Forms of age-related macular degeneration

Age-related macular degeneration progresses through a series of changes in retinal pathology. A patient will not necessarily have the same stage or type of macular degeneration in both eyes.

A three minute video illustrating key aspects of the pathogenesis of age-related macular degeneration is available from: **https://youtu.be/qZVPEYIuujo**

Early and intermediate age-related macular degeneration

In the beginning stages of age-related macular degeneration, lipid deposits known as drusen form in the retinal layers and changes may occur in the retinal pigment epithelium resulting in areas of darkening or lightened pigment. The stage of disease is defined by the size of drusen deposits in the retina and the presence of retinal pigmentation changes:[7]

- **Early** age-related macular degeneration is defined as the presence of medium-sized drusen in one or both eyes (63 – 125 µm; 125 µm is approximately the size of a large vein at the border of the optic disc).
- **Intermediate** age-related macular degeneration is defined as the presence of large drusen (>125 µm), or the presence of hypo- or hyperpigmentation in the retinal pigment epithelium.

Early and intermediate stages of the disease may also be referred to as "early/intermediate dry age-related macular degeneration" due to the absence of exudate or haemorrhage which can occur in neovascular age-related macular degeneration (known as "wet" age-related macular degeneration; see below).

The risk of progression for patients with early to intermediate age-related macular degeneration is highly variable. A simple risk score from zero to four can be calculated based on whether the patient has large drusen (one point) or pigment changes (one point), and whether these are found in one or both eyes, for a total of up to four points (Table 1).

This risk score calculation is not generally used as a clinical tool in New Zealand. In practice, only patients for whom treatment can be offered would benefit from referral to an ophthalmologist, i.e. those with possible neovascular (wet) age-related macular degeneration (see below for definition and Page 35 for treatment options).

Table 1: Early changes in age-related macular degeneration and risk of progression (adapted from AREDS, 2005)[8]

Risk score	Five year risk of developing late age-related macular degeneration*
0	0.4 %
1	3.1 %
2	11.8 – 14.8 %
3	25.9 – 35.4 %
4	47.3 – 53.1 %

* For scores of two to four, the risk of future late age-related macular degeneration in one eye varies from the lower to upper value of the given range, depending on whether late age-related macular degeneration is already present in the other eye.

Late age-related macular degeneration

The advanced stages of age-related macular degeneration are classified as two forms: **geographic atrophy** (also known as "late or advanced dry") and **neovascular** (also known as "wet") age-related macular degeneration. In some cases both types develop in the same eye.[9] Geographic atrophy makes up approximately 80% of cases of late age-related macular degeneration. Severe vision loss and blindness, however, is more likely to occur in people with neovascular age-related macular degeneration.[9]

People with geographic atrophy usually experience a slow and progressive loss of vision: a longitudinal study of people with geographic atrophy reported that 31% had a three-line loss in

visual acuity (equivalent to a symbol needing to be twice as large for a person to view it) within two years, and 53% within four years.[6, 10]

People with neovascular age-related macular degeneration can experience a sudden loss or deterioration of vision due to exudate or retinal haemorrhage. Left untreated, 21% of people have been reported to develop severe vision loss by six months (greater than six line loss in visual acuity testing), increasing to 42% by three years.[10] Neovascular age-related macular degeneration can be further subdivided into variants such as retinal angiomatous proliferation, or polypoidal choroidal vasculopathy, which may influence response to anti-VEGF antibodies and treatment decisions in secondary care (Page 35).[6]

Detecting age-related macular degeneration in primary care can be difficult

Early changes in age-related macular degeneration can be detected in a regular eye examination by an optometrist. Adults are recommended to undergo a general eye examination with an optometrist by the age of 45 years, followed by once every five years until age 60 years, and once every three years thereafter.[11] Patients with visual problems may require more frequent examination, as appropriate for their condition. Patients with signs of macular degeneration may be directly referred by the optometrist to an ophthalmology clinic.

General practitioners should enquire whether older patients have had an eye examination recently: for patients who have not, consider conducting visual acuity testing (see next column for characteristics of macular degeneration seen on visual acuity testing) and direct fundoscopy (see over page for changes seen on fundoscopy in patients with macular degeneration). Regularly recording visual acuity will facilitate detection of gradual visual deterioration in older patients. Medical examinations which older patients require for renewal of their driver licence are a good opportunity to assess all aspects of vision.

Risk factors for the development of age-related macular degeneration include:

- Age – the condition is rare in people aged 50 years or less[1]
- Family history – increases odds approximately six-fold[5]
- Smoking – increases risk approximately 1.9-fold[5]
- Diabetes – increases risk 1.7-fold[5]
- Sunlight – risk increases with greater exposure[12]
- Diets low in fish, fruit and vegetables[13, 14]
- Previous cataract surgery[5]

Research into an association between cardiovascular risk factors and prevalence of age-related macular degeneration has produced inconsistent results. A meta-analysis of relevant studies suggests that risk of age-related macular degeneration is not significantly altered for patients with high blood pressure, cholesterol or triglyceride levels.[5]

Symptoms and signs of age-related macular degeneration

Patients with early age-related macular degeneration are typically asymptomatic. Symptoms do not usually occur until late age-related macular degeneration has developed. **The hallmark symptom of late age-related macular degeneration is a loss or distortion of the central visual field** (Figure 1). However, even in late age-related macular degeneration, patients with changes in one eye only may not notice any alteration of visual acuity or problems with their eyesight.

Symptoms and their rate of progression differ between patients depending on the type of age-related macular degeneration they have, and include:[10]

- Difficulty reading fine print, or worsening difficulty extending to larger print
- A dark area in the central visual field at night or in dark environments, which may resolve as vision adjusts to a lower level of light
- Blurred or wavy vision in the centre of the visual field
- Loss of vision

The most significant sign of age-related macular degeneration is deterioration of best corrected visual acuity. This visual impairment will not improve with pinhole as would be expected with refractive error, and is often worse with pinhole as the retinal image is limited to the (affected) fovea. Other signs may be visible on direct fundoscopy, including drusen, visible as lighter patches in the retina, and retinal haemorrhage or exudates.

See: "What changes can be seen on direct fundoscopy in patients with different stages of macular degeneration?", over page.

The Amsler grid may be useful to assess a distortion of the central visual field, but it is not an essential part of diagnosis (see: "Amsler grid testing", Page 33).

What changes can be seen on direct fundoscopy in patients with different stages of macular degeneration?

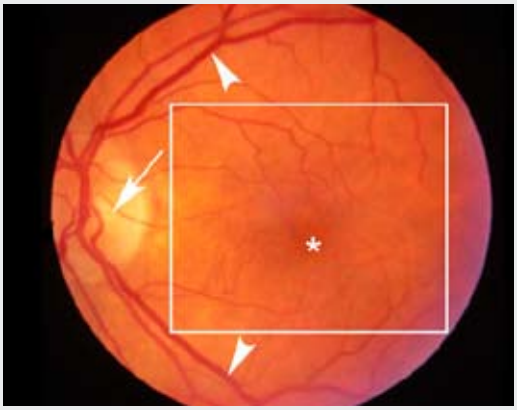


Figure 1: Normal eye in an elderly person – retinal blood vessels (arrowheads) are visible emerging from the optic disc (arrow). These branch into smaller vessels which lead up to the central fovea, appearing as a darkened circle free of blood vessels (asterisk), approximately the same size as the optic disc. The extent of the fovea and parafoveal regions which are responsible for high acuity vision are approximately marked (boxed area).

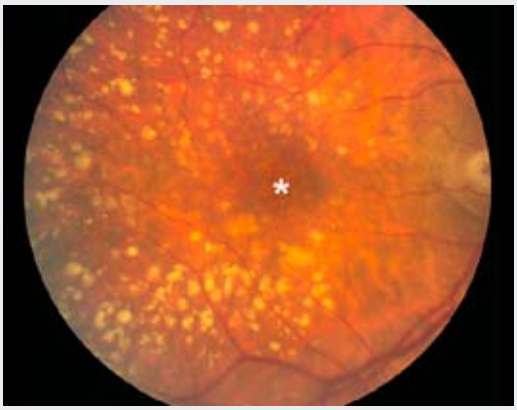


Figure 2: Intermediate age-related macular degeneration – in early and intermediate age-related macular degeneration drusen deposits are visible, appearing as yellow dots. Drusen may be small with discrete margins or larger with indistinct edges. Changes in retinal pigmentation (darkening or lightening or the retinal pigment epithelium) may be visible. Haemorrhage and subretinal fluid are absent. In the image shown, a patient with intermediate age-related macular degeneration has numerous large drusen (>125 µm in diameter) in the posterior pole of the fundus, with the fovea largely spared (asterisk)

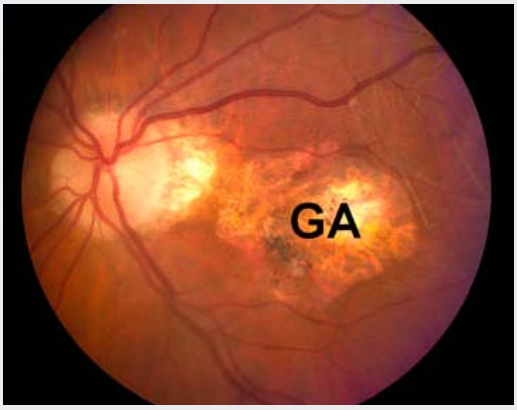


Figure 3: Geographic atrophy – drusen deposits accumulate as numerous spots in the retina and areas of hypopigmentation can be seen which represent atrophy of the retinal pigment epithelium. In advanced disease, as in this image, the region of atrophy can appear similar to a land mass depicted on a map (GA), hence the name geographic atrophy. This patient would be expected to have poor central vision.

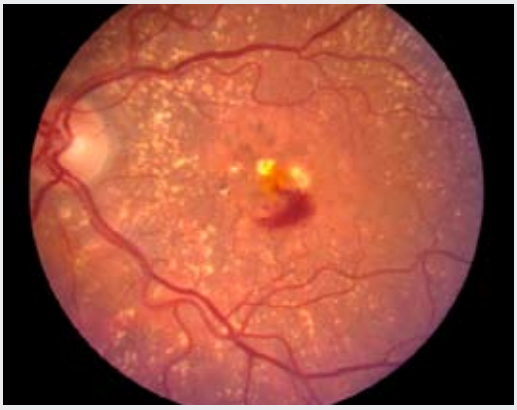


Figure 4: Neovascular age-related macular degeneration – new blood vessels break into the neural retina layer and leak blood constituents, causing accumulation of fluid in the retina and separation of retinal layers, leading to retinal thickening and scarring. In this image, numerous drusen deposits are visible throughout the posterior pole of the fundus. Haemorrhage is visible in the macula, and areas of retinal pigment epithelium atrophy (dark spots in the macula, above and left of the haemorrhage).

Retinal images from Webvision: Age-Related Macular Degeneration (AMD) by Gregory S. Hageman. Available from http://webvision.med.utah.edu/

Patients with a gradual loss of visual acuity where age-related macular degeneration is suspected should be referred to an optometrist.

Red flags:
Patients with age-related macular degeneration should be urgently referred to an ophthalmologist if they have a **sudden onset distortion or loss of vision**.

This may be due to a number of ocular conditions*, including the result of haemorrhage or exudate caused by neovascular age-related macular degeneration. Even short delays in treatment of a matter of weeks can result in poorer outcomes.[1, 10]

* There are a number of possible differential diagnoses for a sudden distortion or loss of vision, including diabetic macular oedema, hypertensive retinopathy, occlusion of the retinal artery, retinal detachment and acute angle glaucoma.[15]

Prevention and reducing the risk of progression

The key risk factors for the development of age-related macular degeneration, age and family history, are not modifiable, but there are steps patients can take to reduce their risk.

Smoking cessation

Smoking cessation is the single most important step patients can take to reduce their risk of developing age-related macular degeneration or reducing progression.[10]

For further information on smoking cessation, see: **www.bpac.org.nz/BPJ/2014/October/smoking-cessation.aspx**

Avoid UV light

Exposure to sunlight has been identified as a risk factor for the development of age-related macular degeneration. Patients can be advised to wear UV-blocking sunglasses* when outdoors and to avoid unprotected exposure to UV light (e.g. welding or UV lamps).[12]

* advise patients to look for a label which states that lenses block 99-100% of UVB and UVA rays, have UV 400 protection (blocks rays with wavelengths up to 400 nanometers) or are a lens category three or four.

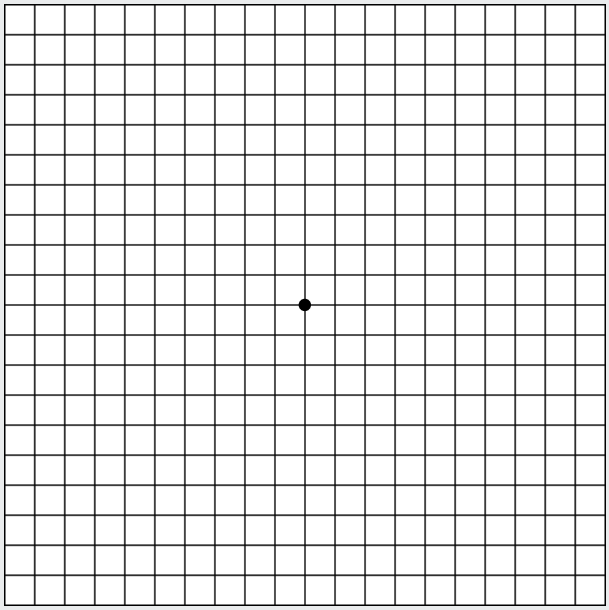
Amsler grid testing

The Amsler grid is a tool to assess visual function. It consists of a simple square grid of lines with a central dot, and is available online, e.g. **www.amd.org/the-amsler-grid**.

The Amsler grid can be useful for detecting age-related macular degeneration: patients may see straight lines on the grid as wavy or blurry. A meta-analysis of 12 studies assessing the performance of the Amsler grid for detecting patients with neovascular age-related macular degeneration reported a sensitivity of 0.78 and specificity of 0.97.[16]

The limitations of the Amsler grid are that patients may have already noticed a problem with seeing straight lines or other changes in vision without the need for a formal test, or may report seeing a normal Amsler grid despite having age-related macular degeneration due to "filling in" of the visual field; as occurs with the blind spot.[17] Clinical guidelines do not specify its use for diagnosis or monitoring of age-related macular degeneration.[10]

If clinicians wish to use the Amsler grid, patients should be approximately reading distance from a printout of the grid, and cover one eye while using the grid to assess each eye individually. Patients should wear any reading glasses or corrective lenses they normally use.[18]



Include fruits, vegetables and fish in the diet

A varied diet with a range of coloured fruits and vegetables and regular fish intake is likely to reduce the risk of development or progression of age-related macular degeneration. Lutein and zeaxanthin are carotenoids which form components of the macula. Dietary sources of lutein and zeaxanthin include egg yolk, corn, kiwifruit, dark green leafy vegetables such as spinach, lettuce and kale, and various coloured vegetables such as green and orange peppers (capsicum), red grapes, pumpkin, broccoli, green beans, zucchini (courgette), honeydew melon, apples and oranges.

A meta-analysis of studies assessing dietary lutein and zeaxanthin intake from food sources suggests high intakes protect against the progression of age-related macular degeneration. People with higher intakes of lutein and zeaxanthin had a 26% reduction in their risk of progression of macular degeneration compared to people with low intakes (relative risk 0.74, 95% CI 0.57-0.97).[14] The Women's Health Initiative study suggests that three and a half servings of fruits and five servings of vegetables per day (two of which are dark green or orange coloured, or legumes) can provide approximately 2 mg/day of lutein and zeaxanthin.[20]

Intake of fish and omega-3 fatty acids, found in oily fish, has also been associated with a reduced risk of age-related macular degeneration. A systematic review and meta-analysis reported the risk of late age-related macular degeneration was reduced by 38% with high omega-3 fatty acid intake and by 33% with intake of fish twice per week.[21]

Supplements may slow progression

A range of supplements available over-the-counter (not subsidised) are advertised as being beneficial to eye health. These often include herbal products such as flower or berry extracts (e.g. bilberry, marigold or blackcurrant extracts), fish oils and omega-3 fatty acids, lutein and zeaxanthin, or supplements including a range of vitamins or minerals. There is evidence that some of these supplements may be beneficial in patients with age-related macular degeneration.

Multivitamin and mineral supplementation

The Age-Related Eye Disease Study (AREDS) and AREDS-2 studies were randomised controlled trials which showed that a combination of vitamins and minerals can reduce progression in people with early to intermediate age-related macular degeneration. The AREDS study found that supplementation with a combination of vitamins C and E, β-carotene, zinc and copper reduced the risk of progression to late age-related macular degeneration by 25% over five years.[22] However, due to safety concerns with the study formulation (in particular, β-carotene, see opposite), a subsequent AREDS-2 randomised controlled trial was undertaken with a revised formulation:[23]

- 500 mg vitamin C
- 400 IU vitamin E
- 25 mg zinc
- 2 mg copper
- 10 mg lutein
- 2 mg zeaxanthin

On the basis of these studies patients with early age-related macular degeneration can be advised there is evidence to support taking supplements similar to the AREDS-2 study supplement formulation*, **to reduce the rate of progression**. However, the longer-term safety of this supplementation regimen has not been studied.

N.B. There is no direct evidence to support the use of this supplement formula to prevent the development of early age-related macular degeneration (primary prevention).

* Based on currently available products in New Zealand, the closest match to the AREDS-2 study formulation would be to take two tablets per day of Blackmores® Macu-Vision® with one tablet per day of Blackmores® Lutein Defence™ supplements. The main difference is that this would provide 80 mg of zinc per day instead of 25 mg, but data from the AREDS-2 study suggest there are no differences in efficacy or safety with this higher zinc dose.[23] Other supplements are available which provide combinations of vitamins and minerals less similar to the AREDS-2 formula or which contain varying quantities of lutein and zeaxanthin alone.

Lutein and zeaxanthin

The AREDS-2 study assessed lutein and zeaxanthin supplementation as part of a combination of vitamins and minerals.[23, 24] On the basis of this study, and a number of smaller studies, supplements containing lutein and zeaxanthin alone may reduce the risk of progression of age-related macular degeneration, particularly for patients with a low dietary intake.[13]

Supplements with no evidence of benefit

Omega-3 fatty acids and fish oils

Although a higher dietary intake of fish and omega-3 fatty acids is associated with reduced risk of age-related macular degeneration, studies assessing taking omega-3 fatty acids in the form of a supplement have not shown these to offer benefit.[13]

Bilberry, marigold or blackcurrant extracts

Supplements containing these extracts have not been

assessed in clinical trials in patients with age-related macular degeneration.

Supplements to avoid

β-carotene

β-carotene is an antioxidant which has been promoted as a supplement for improving vision. However, patients are recommended to avoid supplements containing β-carotene. A study in the 1990s found that supplementation with β-carotene increased the risk of lung cancer in male current smokers, and the AREDS-2 study observed a higher rate of lung cancer in non-smokers taking supplements containing β-carotene.[24, 25]

Management of patients with age-related macular degeneration

While most of the treatment of age-related macular degeneration is performed in secondary care, primary care clinicians have a vital role in helping the patient adapt to any visual problems they experience.

Treatment in secondary care

Treatment interventions are limited to those patients with neovascular (wet) age-related macular degeneration: the principal treatment is now intravitreal injections of anti-VEGF antibodies. Other treatments such as photodynamic therapy with verteporfin, laser ablation of newly formed blood vessels, or surgical approaches have been used in the past but are much less effective than intravitreal anti-VEGF injections and are now limited to use in very select cases.

Patients with neovascular age-related macular degeneration

Anti-VEGF therapies are now the standard first-line treatment for neovascular age-related macular degeneration worldwide, and have transformed the management and prognosis of these patients in less than a decade.[6, 10] These treatments not only show high rates of success in stabilising vision (preventing further visual loss in approximately 95% of patients) but can also improve visual acuity in two-thirds of cases.[26, 27] In New Zealand, two anti-VEGF antibodies which give comparable outcomes are in use: bevacizumab and ranibizumab. The Hospital Medicines List sets criteria for nationally consistent funded access to these treatments – in most cases bevacizumab would be used first-line and ranibizumab used if bevacizumab is not tolerated or is not appropriate. Bevacizumab is considerably less expensive than ranibizumab, and for this reason is the most favoured treatment worldwide. However, this medicine was developed for the treatment of various

What patients can expect from anti-VEGF antibody injections

In studies of bevacizumab or ranibizumab for the treatment of neovascular age-related macular degeneration, patients gain on average approximately three to eight letters in visual acuity (equivalent to one to two lines on a Snellen chart).[26]

Anti-VEGF antibodies are delivered via intravitreal injection, which are usually given monthly when commenced. The timing of later injections differ; most ophthalmologists in New Zealand use a "treat and extend" regimen, where a patient is treated and monitored at each clinic visit, to determine the interval to the next appointment.[1] Patients should expect nine to twelve injections in their first year of treatment, and treatment to last one to two years.

Patients may be understandably hesitant about a treatment which involves injections into the eye. However, the procedure is carried out with topical, and sometimes subconjunctival, anaesthesia and a 30-gauge needle, and involves minimal discomfort; rated on average by patients as two on a ten point pain scale (where zero is no pain).[28] Approximately half of patients studied find the actual pain and discomfort experienced is less than anticipated.[29] Despite the treatment burden there is a high level of support and acceptance of continuing injections: in one study of 200 patients who had received an average of 17.7 injections, 93% reported that they accepted monthly injections due to their importance.[30]

Patients may experience adverse effects resulting from intravitreal injections: subconjunctival haemorrhage, foreign body sensation and transient "bubbles" in the inferior visual field (from inadvertently-injected air bubbles) are very common and the patient should be reassured regarding them. Retinal detachment, retinal/vitreous haemorrhage and damage to the lens are possible if the needle is not inserted correctly (or if the patient moves). These are uncommon with rates of 2% or less reported in randomised controlled trials.[31] The most serious complication is endophthalmitis (infectious or sterile), the risk of which can be reduced with meticulous preparation of the ocular surface with povidone-iodine; published incidence rates are less than 0.1%.[32]

Patients with sight loss may experience visual hallucinations

For reasons which are not well understood people with sight loss can experience visual hallucinations, known as Charles Bonnet syndrome. These range from simple shapes or lines to images of people or buildings. The prevalence of visual hallucinations in patients with age-related macular degeneration has been reported between 5 – 40%.[34]

Patients can find hallucinations distressing and be reluctant to mention them to family or medical professionals for fear they will be labelled as having a psychiatric problem. Patients can be reassured that experiencing these visual hallucinations is relatively common. Evidence regarding treatment of Charles Bonnet syndrome is limited; in some cases it has resolved following an improvement in visual acuity with anti-VEGF treatment. Case reports of improvement with olanzapine, tricyclic antidepressants or donepezil have been published.[34]

cancers and is used off-label for the intravitreal treatment of patients with macular degeneration.[1]

Patients with geographic atrophy

Treatment options for patients with geographic atrophy are limited. Management focuses on support and counselling, follow-up monitoring, and advising on measures that may reduce rates of progression (see: "Prevention and reducing the risk of progression", Page 33).[10]

Living with age-related macular degeneration

Patients with gradual or sudden deterioration in vision can experience changes which impact all aspects of their life, such as their ability to work, read, use computers, drive, engage in hobbies or sports, and maintain their level of independence and relationships with others. Patients may be anxious about possible future loss of vision and ultimately blindness, as well as testing and treatment requirements for their condition. The prevalence of depression in people with age-related macular degeneration is reported to be between 16–44%.[33] Patient reports from the Visual Impairment Charitable Trust Aotearoa NZ highlight the degree of personal distress for people diagnosed with age-related macular degeneration:[3]

"Realising that one's sight is deteriorating and it's not going to get any better is shattering. It's traumatic. It's an incredible loss."

"Losing your sight is frightening, really frightening. You lose confidence. You get scared to go out the door. You need someone to explain the obstacles you might encounter and how to deal with them."

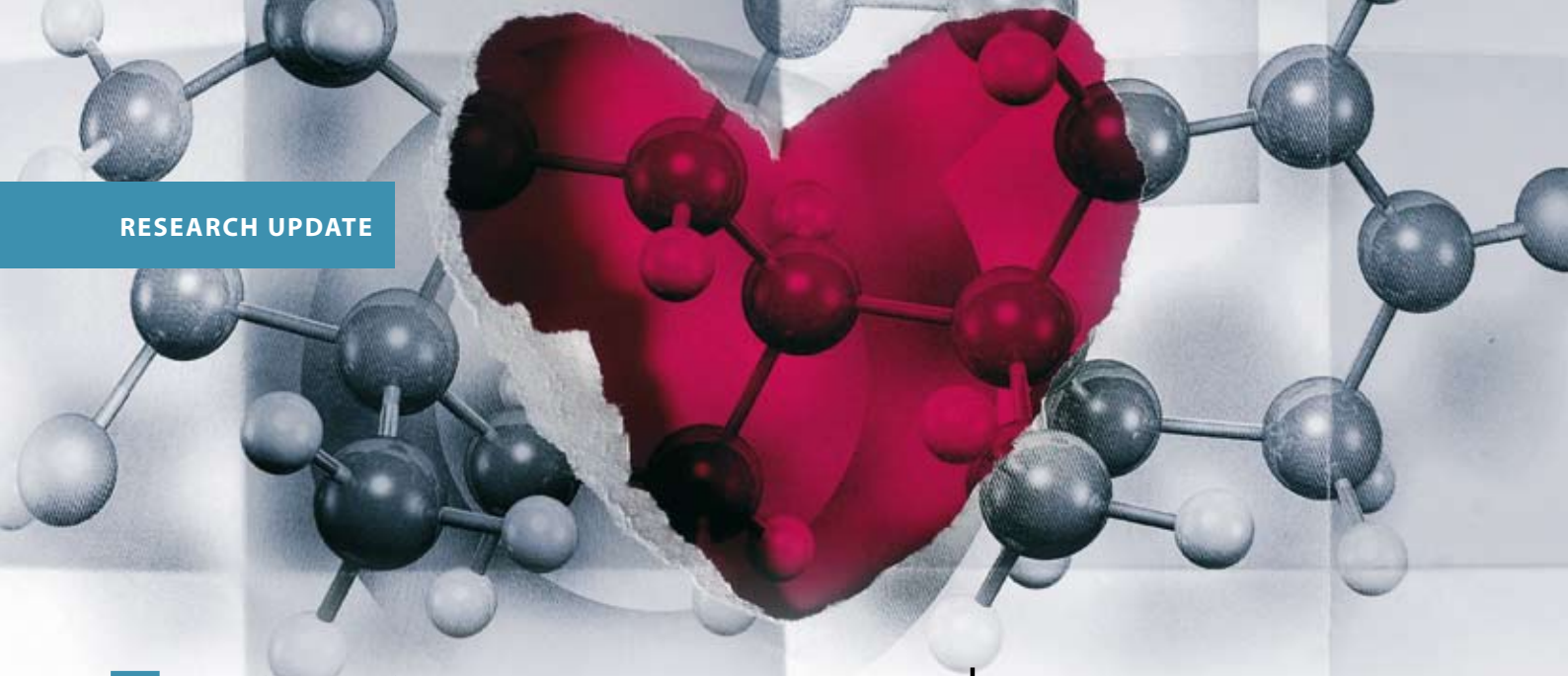
Patients with visual acuity ≤ 6/24 in the better eye with corrective lenses, or with major visual field defects can be referred to the Blind Foundation of New Zealand. Patients can learn skills for adapting to life with reduced vision, and techniques to assist with mobility and orientation. The Blind Foundation helps patients obtain equipment, access financial assistance and receive peer support and counselling.

For practical information for patients on managing daily living with sight loss, see: **http://blindfoundation.org.nz/members/useful-resources/handy-hints-for-those-with-low-vision**

Acknowledgement: Thank you to **Dr Logan Mitchell**, Consultant Ophthalmologist, Dunedin Hospital, Senior Lecturer, Dunedin School of Medicine, University of Otago for expert review of this article.

References:

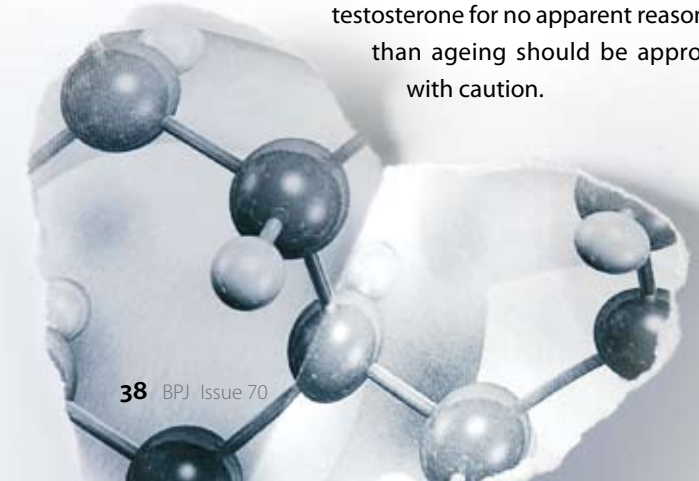
1. National Health Committee. Age-related macular degeneration. Wellington, New Zealand: National Health Committee, 2015. Available from: http://nhc.health.govt.nz/ (Accessed Aug, 2015).
2. Access Economics. Clear focus - the economic impact of vision loss in New Zealand in 2009. A report for Vision 2020 Australia in support of the Vision 2020 New Zealand Trust. Australia: Access Economics Pty Limited, 2010. Available from: http://blindfoundation.org.nz/learn/blindness/clear-focus (Accessed Aug, 2015).
3. National Health Committee. Age-related macular degeneration, Tier 2 assessment consultation submissions. Wellington, New Zealand: National Health Committee, 2015. Available from: http://nhc.health.govt.nz (Accessed Aug, 2015).
4. Worsley D, Worsley A. Prevalence predictions for age-related macular degeneration in New Zealand have implications for provision of healthcare services. N Z Med J 2015;128:44–55.
5. Chakravarthy U, Wong TY, Fletcher A, et al. Clinical risk factors for age-related macular degeneration: a systematic review and meta-analysis. BMC Ophthalmol 2010;10:31.
6. Lim LS, Mitchell P, Seddon JM, et al. Age-related macular degeneration. Lancet 2012;379:1728–38.
7. Ferris FL, Wilkinson CP, Bird A, et al. Clinical classification of age-related macular degeneration. Ophthalmol 2013;120:844–51.
8. Age-Related Eye Disease Study Research Group. A simplified severity scale for age-related macular degeneration: AREDS report no. 18. Arch Ophthalmol 2005;123:1570–4.
9. Holz FG, Strauss EC, Schmitz-Valckenberg S, et al. Geographic atrophy: clinical features and potential therapeutic approaches. Ophthalmol 2014;121:1079–91.
10. Royal College of Ophthalmologists. Age-related macular degeneration: guidelines for management. London: Royal College of Ophthalmologists, 2013. Available from: www.rcophth.ac.uk (Accessed Aug, 2015).
11. Glaucoma NZ. Glaucoma screening. Available from: www.glaucoma.org.nz/About-Glaucoma/Investigations/Glaucoma-Screening.asp (Accessed Aug, 2015).
12. Sui G-Y, Liu G-C, Liu G-Y, et al. Is sunlight exposure a risk factor for age-related macular degeneration? A systematic review and meta-analysis. Br J Ophthalmol 2013;97:389–94.
13. Broadhead GK, Grigg JR, Chang AA, et al. Dietary modification and supplementation for the treatment of age-related macular degeneration. Nutr Rev 2015;73:448–62.
14. Ma L, Dou H-L, Wu Y-Q, et al. Lutein and zeaxanthin intake and the risk of age-related macular degeneration: a systematic review and meta-analysis. Br J Nutr 2012;107:350–9.
15. Francis AW, Lim JI, Chau FY. Sudden-onset paracentral vision loss. JAMA Ophthalmol 2014;132:1367–8.
16. Faes L, Bodmer NS, Bachmann LM, et al. Diagnostic accuracy of the Amsler grid and the preferential hyperacuity perimetry in the screening of patients with age-related macular degeneration: systematic review and meta-analysis. Eye (Lond) 2014;28:788–96.
17. Crossland M, Rubin G. The Amsler chart: absence of evidence is not evidence of absence. Br J Ophthalmol 2007;91:391–3.
18. Macular Degeneration Foundation Australia. Macular degeneration. Sydney, NSW: Macular Degeneration Foundation Australia, 2013. Available from: www.mdfoundation.com.au/resources/1/factsheets/MD_Booklet_2013-10_Web.pdf (Accessed Aug, 2015).
19. Marmor MF, Kellner U, Lai TYY, et al. Revised recommendations on screening for chloroquine and hydroxychloroquine retinopathy. Ophthalmol 2011;118:415–22.
20. Mares JA, Voland RP, Sondel SA, et al. Healthy lifestyles related to subsequent prevalence of age-related macular degeneration. Arch Ophthalmol 2011;129:470–80.
21. Chong EW-T, Kreis AJ, Wong TY, et al. Dietary omega-3 fatty acid and fish intake in the primary prevention of age-related macular degeneration: a systematic review and meta-analysis. Arch Ophthalmol 2008;126:826–33.
22. Age-Related Eye Disease Study Research Group. A randomized, placebo-controlled, clinical trial of high-dose supplementation with vitamins C and E, beta carotene, and zinc for age-related macular degeneration and vision loss: AREDS report no. 8. Arch Ophthalmol 2001;119:1417–36.
23. Age-Related Eye Disease Study 2 Research Group. Lutein + zeaxanthin and omega-3 fatty acids for age-related macular degeneration: the Age-Related Eye Disease Study 2 (AREDS2) randomized clinical trial. JAMA 2013;309:2005–15.
24. The Age-Related Eye Disease Study 2 (AREDS2) Research Group. Secondary analyses of the effects of lutein/zeaxanthin on age-related macular degeneration progression: Areds2 report no. 3. JAMA Ophthalmol 2014;132:142–9.
25. The Alpha-Tocopherol, Beta Carotene Cancer Prevention Study Group. The effect of vitamin E and beta carotene on the incidence of lung cancer and other cancers in male smokers. N Engl J Med 1994;330:1029–35.
26. Solomon SD, Lindsley K, Vedula SS, et al. Anti-vascular endothelial growth factor for neovascular age-related macular degeneration. Cochrane Database Syst Rev 2014;8:CD005139.
27. Bressler NM, Chang TS, Suñer IJ, et al. Vision-related function after ranibizumab treatment by better- or worse-seeing eye: clinical trial results from MARINA and ANCHOR. Ophthalmology 2010;117:747–56. e4.
28. Chua PYS, Mitrut I, Armbrecht A-M, et al. Evaluating patient discomfort, anxiety, and fear before and after ranibizumab intravitreous injection for wet age-related macular degeneration. Arch Ophthalmol 2009;127:939–40.
29. Boyle J, Vukicevic M, Koklanis K, et al. Experiences of patients undergoing anti-VEGF treatment for neovascular age-related macular degeneration: a systematic review. Psychol Health Med 2015;20:296–310.
30. Droege KM, Caramoy A, Kersten A, et al. Patient preference of ranibizumab treatment regimen for neovascular age-related macular degeneration - monthly injections versus pro re nata. Graefes Arch Clin Exp Ophthalmol 2014;252:31–4.
31. Schmucker C, Ehlken C, Agostini HT, et al. A safety review and meta-analyses of bevacizumab and ranibizumab: off-label versus goldstandard. PLoS ONE 2012;7:e42701.
32. McCannel CA. Meta-analysis of endophthalmitis after intravitreal injection of anti-vascular endothelial growth factor agents: causative organisms and possible prevention strategies. Retina (Philadelphia, Pa) 2011;31:654–61.
33. Dawson SR, Mallen CD, Gouldstone MB, et al. The prevalence of anxiety and depression in people with age-related macular degeneration: a systematic review of observational study data. BMC Ophthalmol 2014;14:78.
34. Schadlu AP, Schadlu R, Shepherd JB. Charles Bonnet syndrome: a review. Curr Opin Ophthalmol 2009;20:219–22.



Testosterone use and cardiovascular risk in older males

In the previous edition of Best Practice Journal, we covered the appropriate use of testosterone in older male patients (see: "Prescribing testosterone in ageing males: why you shouldn't read this article", BPJ 69, Aug, 2015). One area of concern discussed in the article is whether testosterone use in this patient group affects cardiovascular risk. Three studies that suggested an increase in cardiovascular risk in older males taking testosterone drew the attention of the United States Food and Drug Administration (FDA), American Urological Association, and New Zealand Medicines Adverse Reaction Committee. As the previous Journal went to print, two additional studies regarding the cardiovascular safety of testosterone in older males, and an editorial from the FDA regarding the use of testosterone in older males, were published.

Although we are drawing attention to these new studies and concerns from the FDA to keep readers informed, the conclusions of our previous article remain the same: at present there is no data from randomised controlled trials in older males regarding the effect of testosterone use on cardiovascular events. Therefore, the use of testosterone in older males who have low testosterone for no apparent reason other than ageing should be approached with caution.



The TEAAM trial[1]

The Testosterone's Effects on Atherosclerosis Progression in Aging Men (TEAAM) trial investigated whether testosterone use (in the form of a transdermal gel) altered the progression of atherosclerosis in males aged 60 years and over. The study recruited 308 participants who were community-dwelling males; 15% had prior coronary artery disease and approximately 44% were using statins. Participants applied 7.5 g of testosterone gel daily, which could be adjusted to 5 g or 10 g depending on achieved testosterone levels, or a placebo gel daily, for three years. The progression of atherosclerosis was assessed by measuring carotid artery intima-media thickness and coronary artery calcium.

The rate of change of coronary artery intima-media thickness or coronary artery calcium scores did not differ between participants taking testosterone or placebo; both groups showed the same rate of progression. Among participants using testosterone, changes in measures of atherosclerosis did not correlate with changes in total or free testosterone levels. The findings suggest testosterone use does not affect the progression of atherosclerosis in older males. The strengths of this study include a double-blind randomised controlled trial design, the use of doses of testosterone adjusted to match what would normally occur in clinical practice, and that patients were followed for three years of testosterone use. While these results are reassuring, the study only examined atherosclerosis; testosterone could potentially affect other factors which influence risk of a cardiovascular event, such as plaque stability, clot formation or physiological processes involved in cardiovascular disease which are not yet well understood.

Retrospective review of testosterone treatment in older males[2]

Sharma *et al*. conducted a retrospective assessment of older males in the Veteran's Affairs network of clinical centres in the United States. The study identified males who had biochemical evidence of hypogonadism. Patients were then divided into three groups depending on whether they were untreated (13,378 patients), were prescribed testosterone and subsequently achieved normal total testosterone levels (normalised treated; 43,931 patients), or were prescribed testosterone but continued to have low testosterone levels, suggesting lack of compliance or inappropriate dosing (non-normalised treated; 25,701 patients). The median age of participants was 66 years, and the duration of testosterone use was on average three years for males who achieved normalisation of testosterone levels and one and a half years for non-normalised treated males.

This study found that males who achieved normal testosterone levels had a lower risk of all-cause mortality (hazard ratio, HR: 0.44, 95% confidence interval, CI: 0.42–0.46), myocardial infarction (HR: 0.76, CI 0.63–0.93) and ischaemic stroke (HR: 0.64, CI 0.43–0.96) than males who were not prescribed testosterone*. Males who were prescribed testosterone but continued to have low testosterone levels had significantly lower mortality rates (HR: 0.84, CI 0.80–0.89), but not lower rates of myocardial infarction or stroke, than untreated males.

This is not the first study to conduct a retrospective review of testosterone use. Previous research has, however, been limited by lack of assessment of patient compliance or whether the dose prescribed was appropriate. By classifying patients according to achieved testosterone levels, this study design largely overcomes this limitation. The results suggest that older males with hypogonadism who achieve normalisation of serum testosterone levels have a reduced risk of overall mortality, myocardial infarction and stroke.

However, the study has the limitations of any retrospective observational study: it is not a randomised controlled trial and unrecognised confounding factors may be present which influence the study's results. For example, it is possible that patients who were not prescribed testosterone had contraindications or other clinical factors which led their treating clinician to decide not to initiate testosterone use in spite of biochemical evidence of hypogonadism. Although the authors of the study conducted statistical adjustments for recorded differences in cardiovascular risk between groups, unknown factors may have caused spurious associations of cardiovascular events, mortality and testosterone use.

* The hazard ratio is a measure of the chance of an event occurring at any point during follow-up, so that these results mean, for example, that males taking testosterone were 44% as likely to die as males not using testosterone at any point during the follow-up period included in the study.[3]

What is a prescriber to make of this?

Both of these studies provide further data on an area of clinical controversy, although their results are not sufficient to direct a change in clinical practice. The TEAAM trial provides reassuring data that testosterone use does not appear to influence progression of atherosclerosis, and Sharma et al. found an association between testosterone use and reduced all cause mortality and cardiovascular disease. However, these results are insufficient by themselves to offer a clean bill of cardiovascular safety for testosterone use in older males.

In an editorial published in August, 2015 in the New England Journal of Medicine, authors from the FDA summarised various areas of concern for the agency.[4] In particular, testosterone products have previously only been required to show that they are able to raise testosterone levels for FDA approval. The intention was that these products would be used for males with conditions falling under what the agency called "classic hypogonadism", such as Klinefelter's syndrome, pituitary disease or testicular damage; patients for whom supplementation was clearly clinically indicated. The FDA holds concerns over the use of these products to treat males with age-related declines in testosterone, since this appears to be a common feature of ageing and the risks and benefits of testosterone use in this patient group are uncertain. The agency has now signalled that it is encouraging companies that manufacture testosterone products to work together on a single trial which will assess cardiovascular safety.[4]

References:

1. Basaria S, Harman SM, Travison TG, et al. Effects of testosterone administration for 3 years on subclinical atherosclerosis progression in older men with low or low-normal testosterone levels: a randomized clinical trial. JAMA 2015;314:570–81.
2. Sharma R, Oni OA, Gupta K, et al. Normalization of testosterone level is associated with reduced incidence of myocardial infarction and mortality in men. Eur Heart J 2015;[Epub ahead of print].
3. Sedgwick P, Joekes K. Interpreting hazard ratios. BMJ 2015;351:h4631.
4. Nguyen CP, Hirsch MS, Moeny D, et al. Testosterone and 'Age-Related Hypogonadism'--FDA Concerns. N Engl J Med 2015;373:689–91.

Treating GAS to reduce transmission to a vulnerable community

Dear Editor,

Associate Professor Mark Thomas provides sensible prescribing advice in the Upfront article "Time to reduce antibiotic prescribing – NOW". However, there are some situations when it may be appropriate to prescribe antibiotics to a person at low risk of developing acute rheumatic fever to prevent them passing on a GAS infection to a vulnerable population. For example, a New Zealand European teacher with GAS pharyngitis working at a predominantly Māori low-decile primary school may be at risk of passing this infection on to students.

General Practitioner, Te Awamutu

Response from bpac^{nz} editorial team:

In the "Upfront" article in the antibiotic issue, BPJ 68 (Jun, 2015), Associate Professor Mark Thomas recommended three simple changes to antibiotic prescribing for health professionals to improve antimicrobial stewardship. The first of these was:

"Do not prescribe an antibiotic for patients with a sore throat who are not of Māori or Pacific ethnicity and not aged between 5 and 18 years."

This advice is based on the observation that acute rheumatic fever is extremely uncommon in non-Māori and non-Pacific peoples,[1] and that the majority of cases of rheumatic fever in New Zealand occur in people aged between five and 19 years. From January 2002 to December 2011, 80% of patients diagnosed with acute rheumatic fever in the Waikato DHB were Māori and 92% were aged between five and 19 years.[2] Therefore in populations at low risk of developing acute rheumatic fever, throat swabbing and antibiotic prescribing for group A streptococcal (GAS) pharyngitis is generally not recommended.[1] This is because the risk of increasing antimicrobial resistance and the possible adverse effects associated with the use of antibiotics are judged to exceed any benefits provided by the prophylaxis of rheumatic heart disease.

However, there are exceptions to every rule. GAS throat infection is highly transmissible by droplet spread.[1] Rates of transmission of GAS infection are estimated to be up to 25% to the close contacts of people with active GAS infections.[3] Therefore the New Zealand National Heart Foundation recommends considering throat swabbing and treating workers at increased risk of spreading GAS to vulnerable populations, e.g. healthcare and residential care workers, food handlers, teachers and childcare workers,[1] who present with symptoms consistent with GAS pharyngitis. If the patient is GAS positive then further consideration should be given to isolating them for 24 hours after starting antibiotics.[1] Situations where this might be appropriate are relatively uncommon, but could include the scenario described by our correspondent. In most situations, throat swabbing and antibiotic treatment in populations at low risk of acute rheumatic fever should be avoided.[1]

References

1. Heart Foundation of New Zealand. Group A streptococcal sore throat management guideline. 2014. Available from: www.heartfoundation.org.nz (Accessed Aug, 2015).
2. Pennock V, Bell A, Moxon TA, et al. Retrospective epidemiology of acute rheumatic fever: a 10-year review in the Waikato District Health Board area of New Zealand. N Z Med J 2014;127:26–37.
3. Shulman ST, Bisno AL, Clegg HW, et al. Clinical practice guideline for the diagnosis and management of Group A streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America. Clin Infect Dis 2012;55:e86–102.

Does tart cherry help with sleep?

Dear Editor,

I was interested to read your recent article on melatonin ("Melatonin: is it worth losing any sleep over?", BPJ 69, Aug, 2015). I have had a number of patients with sleep problems asking if they should take Tart Cherry supplements; some have been using them for their children. The promotional material regarding these products claims that because they contain a natural form of melatonin, they can help with sleep and are safe to be used in children. Is there any good evidence that these products are effective and safe?

General Practitioner, Dunedin

Response from bpac^{nz} editorial team:

It is claimed that cherries and cherry extracts, particularly tart cherry, are associated with several health benefits, such as improving sleep, reducing muscle recovery time after exercise and decreasing inflammation.[1] Cherries are generally divided into sweet or tart varieties. There are two main types

of tart cherries – morello and amarelle. Montmorency tart cherries, which are a variety of amarelle, are the most common constituent of "medicinal" cherry products. Tart cherries contain various phytochemicals, including anthocyanins, which are reported to have cellular oxidative stress protection properties.[1] They also contain anti-inflammatory cytokines and melatonin, which if absorbed, may have sleep regulation properties.[1]

To date, there has been limited clinical research investigating the effect of cherry extracts on sleep. Notable small studies include:

- A randomised, double-blind, placebo-controlled, crossover study investigated twenty healthy adults who consumed tart cherry concentrate or placebo within 30 minutes of waking and 30 minutes before their evening meal, for seven days. Based on sleep diary data, participants had a significant increase in total sleep time when taking tart cherry extract, and non-significant reductions in time taken to fall asleep (sleep latency - approximately five minutes) and wake after sleep onset (approximately one minute).[2]
- Another randomised, double-blind, placebo-controlled, crossover study investigated the effect of tart cherry extract in 15 older adults with chronic insomnia. Participants took treatment or placebo for two weeks, with a two week intervening washout period. Assessment was based on sleep diary data and an insomnia severity index. Tart cherry was associated with a significant reduction in insomnia severity (minutes awake after sleep onset), but no significant improvements in sleep latency, total sleep time or sleep efficiency compared to placebo. The authors noted that the effects of tart cherry were equal to or exceeded those found with valerian and equal to some but not all studies of melatonin. The effects were, however, considerably less than for evidence-based treatments for insomnia such as cognitive behavioural therapy.[3]
- In a randomised, double-blind, placebo-controlled, crossover study investigating Jerte Valley (Spain) sweet cherry extract, 30 adults took the extract or placebo over seven 72 hour periods. When the cherry extract was taken, participants had improved nocturnal rest measured by sleep efficiency, number of awakenings, total nocturnal activity, sleep latency, assumed sleep, actual sleep and immobility. Older adults had greater improvements in sleep.[4]

In each of the studies, participants taking the cherry extracts were found to have detectable levels of melatonin in their urine; melatonin was not detected after taking placebo. In the tart cherry studies, however, the amount of melatonin taken was estimated to be 0.08 mg – less than the lowest doses of exogenous melatonin found to have an impact on sleep (0.3 mg).[1] The short half-life of melatonin (less than one hour) suggests that the improvements seen in wake after sleep onset may also be due to other mechanisms or factors.[1]

None of the studies included discussion of adverse effects associated with the cherry extracts. In addition, there have been no studies involving children, therefore the efficacy and safety of cherry extract in this group is unknown.

A pragmatic approach if a patient or parent wishes to trial the use of a tart cherry product (available in New Zealand as juice, capsules, lozenges and sachets), is to suggest that the supplement is taken daily for one to two weeks while monitoring sleep quality. The supplement should be ceased if sleep parameters do not improve within this time, or if the patient believes they are experiencing adverse effects.

References

1. Yurcheshen M, Seehuus M, Pigeon W. Updates on nutraceutical sleep therapeutics and investigational research. Evid Based Complement Alternat Med 2015;105256.
2. Howatson G, Bell P, Tallent J, et al. Effect of tart cherry juice (Prunus cerasus) on melatonin levels and enhanced sleep quality. Eur J Nutr 2012;51(8):909–16.
3. Pigeon W, Carr M, Gorman C, Perlis M. Effects of a tart cherry juice beverage on the sleep of older adults with insomnia: a pilot study. J Med Food 2010;13(3):579–83.
4. Garrido M, Gonzalez-Gomez D, Lozano M, et al. A Jerte Valley cherry product provides beneficial effects on sleep quality. Influence on aging. J Nutr Health Aging 2013;17(6):553-60.

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