



RACGP

Royal Australian College of General Practitioners

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Supporting smoking cessation

A guide for health professionals
Consultation draft, May 2019

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DRAFT

Supporting smoking cessation: a guide for health professionals

1. About this guideline

The Royal Australian College of General Practitioners (RACGP) first developed *Supporting smoking cessation: a guide for health professionals* in 2011. Since then it has been updated on two occasions, in June 2012, and in July 2014. The current update is the most comprehensive, bringing the guideline in line with new modalities of smoking cessation and incorporating GRADE, (Grading of Recommendations, Assessment, Development and Evaluation) a new approach to assessing clinical evidence and drafting practice recommendations.

Target population and audience

This guideline applies to all health professionals who support people wishing to quit smoking. It is intended to be relevant to the wider primary care setting, and not limited to general practice. This is reflected in the multidisciplinary composition of the guideline development expert advisory group.

Guideline development – multidisciplinary expert advisory group

The Royal Australian College of General Practitioners (RACGP) is grateful for the expert advice from the following content advisors, who contributed to the 2019 update of the guidelines:

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Ms Mary Sinclair, Medical Writer.

Declaration of interests and the process for management of conflicts

This guideline was developed in accordance with the rules and processes outlined in the RACGP Conflict of Interest Policy. The RACGP Conflict of Interest Policy is available at www.racgp.org.au/support/policies/organisational

All guideline development advisory group members completed a Declaration of Interests (DOI) register before the commencement of guideline development. Any additional DOIs were declared at the start of all meetings, and appropriately recorded. If a member declared an interest that was identified as a conflict, to a specific intervention, they did not participate in the decision-making for that particular recommendation. Declarations of interests are provided in Appendix 1.

The update of the RACGP *Supporting smoking cessation: a guide for health professionals*, was funded in part by the Commonwealth Department of Health, and VicHealth.

The evidence supporting recommendations - the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) Process

The Royal Australian College of General Practitioners commissioned the Joanna Briggs Institute (JBI) and the JBI Adelaide GRADE Centre to assist with the update of the smoking cessation guideline.

GRADE refers to Grading of Recommendations, Assessment, Development and Evaluation (see <http://www.gradeworkinggroup.org/>) Using GRADE to develop

guidelines, requires an evidence review resulting in a GRADE Summary of Findings table, a summarised representation of the major synthesised findings along with a rating of the certainty in the evidence.

These Summary of Findings tables are then incorporated in Evidence to Decision Frameworks which the guideline panel work through to move from the evidence to making a practice recommendation, whilst ensuring that all the important aspects related to making structured recommendations are taken into account. This results in transparent and practice-based recommendations.

New smoking cessation questions and recommendations

Since the last update, the field of smoking cessation has moved forward and now includes more sophisticated pharmacology, technology in the form of quitting apps, and controversial nicotine delivery modalities such as electronic cigarettes (e-cigarettes). New topics identified by the Expert Advisory Group (EAG) included questions on combinations and dosage of pharmacotherapies, relapse prevention, use of nicotine replacement therapy during pregnancy, and the question of e-cigarettes as a cessation aid.

Clinical questions on these topics were formulated as PICO (patient, intervention, comparator, outcome) questions, which were subjected to the GRADE process. The prioritised clinical questions were:

- Is combination nicotine replacement therapy (NRT) (patch and oral form) more effective than patch alone and if so is this effect for all smokers or only for more dependent smokers?
- Is a combination of varenicline and NRT more effective than varenicline alone and if so is this effect for all smokers or only for more dependent smokers?
- Does adding any further course of NRT (any form) reduce relapse in smokers who have quit at the completion of a standard course of NRT?
- Does adding any further course of varenicline (> 12 weeks) reduce relapse in smokers who have quit at the completion of a standard course of Varenicline (12 weeks)?
- Is it safe and effective for a pregnant smoker to use NRT rather than no NRT?
- Are nicotine containing e-cigarettes more effective than nicotine replacement therapy for smoking cessation

Key evidence and recommendations from the 2014 edition were reviewed by the EAG and those that remained relevant were carried forward into the 2019 edition. The existing NHMRC levels of evidence and USPSTF strength of evidence format of these recommendations was retained.

Thus, the guideline contains two styles of recommendations – GRADE and NHMRC. The technical report outlining the GRADE evidence review process and summary of findings tables is available on request.

Explanation for levels of evidence and strength of recommendations

The GRADE system classifies the quality of the evidence into one of four scores:

High: We are very confident that the true effect lies close to that of the estimate of the effect.

Moderate: We are moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.

Low: Our confidence in the effect estimate is limited: the true effect maybe substantially different from the estimate of the effect.

Very low: We have very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of the effect.

Strength of recommendation:

- Strong recommendation for (or against) the intervention
- Weak recommendation for (or against) the intervention
- Conditional (neutral) recommendation

The NHMRC system classifies the quality of the evidence as follows: (NHMRC 1999)

Level I – Evidence obtained from systematic review of relevant randomised controlled trials

Level II – Evidence obtained from one or more well designed, randomised controlled trials

Level III – Evidence obtained from well-designed, non-randomised controlled trials, or from well-designed cohort or case control studies

Level IV – Evidence obtained from case series, either post-test or pre-test and post-test

Level V – Opinions of respected authorities based on clinical experience, descriptive studies, reports of expert committees

No evidence – No evidence was found relevant to general practice on the issue being considered

Strength of recommendation: (US Preventive Services Task Force 1996)

A – There is good evidence to support the recommendation

B – There is fair evidence to support the recommendation

C – There is poor evidence regarding the inclusion, or exclusion of the recommendation but recommendations may be made on other grounds.

Summary of recommendations

The role of health professionals

Recommendation 1

Evidence

Smoking cessation advice from health professionals is effective in increasing quit rates. The major effect is to help motivate a quit attempt. **Level I.**

All health professionals can be effective in providing smoking cessation advice.

Level I

Recommendation

All smokers should be offered brief advice to quit. **Strength A**

Recommendation 2

Evidence

Instituting a system designed to identify and document tobacco use almost doubles the rate of health professional intervention and results in higher rates of cessation.

Level II

Recommendation

A system for identifying all smokers and documenting tobacco use should be used in every practice or healthcare service. **Strength A**

Recommendation 3

Evidence

Brief smoking cessation advice from health professionals delivered opportunistically during routine consultations has a modest effect size, but substantial potential public health benefit. **Level I**

Recommendation

Offer brief cessation advice in routine consultations and appointments whenever possible (at least annually). **Strength A**

Recommendation 4

Evidence

Follow-up is effective in increasing quit rates. **Level I**

Recommendation

All smokers attempting to quit should be offered follow-up. **Strength A**

Pharmacotherapy for smoking cessation

Recommendation 5

Evidence

Pharmacotherapy with nicotine replacement therapy, varenicline or bupropion is an effective aid to assisting motivated smokers to quit. **Level I**

Recommendation

In the absence of contraindications, pharmacotherapy should be offered to all motivated smokers who have evidence of nicotine dependence. Choice of pharmacotherapy is based on efficacy, clinical suitability and patient choice.

Strength A

Recommendation 6

Evidence

Nicotine replacement used as monotherapy increase quit rates by 50–70% at 5–12 months follow-up compared with placebo, and regardless of the setting. **Level I**

Recommendation

NRT should be recommended to nicotine-dependent smokers. There is no significant difference in effectiveness of different forms of NRT in achieving cessation, so choice of product depends on clinical suitability and patient preference. **Strength A**

Recommendation 7 (GRADE)

For people who smoke, are wanting to quit and are currently receiving behavioural support, clinicians should recommend combination NRT over single NRT.

Strong recommendation; moderate certainty

Recommendation 8 (GRADE)

Recommendation: For people who have abstained from smoking at the end of a standard course of NRT, clinicians may consider recommending an additional course of NRT for sustained abstinence.

Conditional recommendation for or against the intervention; low certainty

Recommendation 9

Evidence

There is no evidence of increased risk for use of NRT in people with stable cardiovascular disease. **Level II**

There is no evidence of an association between use of nicotine patch and acute cardiac events. **Level II**

Recommendations

NRT is safe to use in patients with stable cardiovascular disease. **Strength A**

NRT should be used with caution in patients who have had a recent myocardial infarction, unstable angina, severe arrhythmias or recent cerebrovascular events.

Strength C

Recommendation 10 (GRADE)

Recommendation: For women who are pregnant who aim to quit smoking, clinicians might recommend NRT as compared to no NRT.

Conditional recommendation for or against the intervention; low certainty

Recommendation 11 (GRADE)

For people who smoke, are wanting to quit and are currently receiving behavioural support, clinicians may consider a further course of varenicline to prevent relapse.

Conditional recommendation for or against the intervention; low certainty

Recommendation 12 (GRADE)

Recommendation: For people who smoke who are wanting to quit, clinicians might recommend the use of varenicline in combination with NRT as compared to varenicline alone.

Conditional recommendation; moderate certainty

Recommendation 13

Evidence

Varenicline is an efficacious smoking cessation treatment. **Level I**

Recommendation

Varenicline should be recommended to smokers who have been assessed as clinically suitable for this medication and should be provided in combination with counselling. **Strength A**

Recommendation 14

Evidence

Bupropion sustained release is an efficacious smoking cessation treatment. **Level I**

Recommendation

Bupropion sustained release should be recommended to smokers who have been assessed as clinically suitable for this medication and provided in combination with counselling. **Strength A**

Recommendation 15

Evidence

Nortriptyline is an efficacious smoking cessation treatment in people with and without a history of depression. **Level II**

Recommendation

Nortriptyline should only be considered as a second line agent due to its adverse effects profile. **Strength B**

Recommendation 16 (GRADE)

Recommendation: E-cigarettes are not first line treatments. The strongest evidence base of efficacy and safety is for currently approved pharmacological therapies combined with behavioural support. Patients should be reminded that successful quitting often takes a number of attempts and a range of strategies are available to maximise the benefit of approved therapies. The lack of tested and standardised e-cigarette products creates an uncertain environment for both patients and clinicians and development of a suitable regulatory process is urgently needed. However, for people who have tried to achieve smoking cessation with approved pharmacotherapies but failed, are still motivated to quit smoking and have brought up e-cigarette usage with their healthcare practitioner, e-cigarettes may be a reasonable intervention to recommend. This needs to be preceded by an evidence-informed shared-decision making process, whereby the patient is aware of the following caveats:

1. Due to the lack of available literature, the long-term health effects of vaping are unknown.
2. E-cigarettes are currently not regulated in Australia and therefore the constituents of the vapour they produce has not been tested.
3. There is a lack of uniformity in delivery devices and the e-liquid constituents which increases the uncertainties associated with their usage.
4. In order to maximise possible benefit and minimise risk of harms short-term use only should be recommended.
5. Dual use (that is, with continued tobacco smoking) needs to be avoided.

Conditional recommendation for either the intervention or the comparison

Behavioural and advice-based support for smoking cessation

Recommendation 17

Evidence

Telephone call back counselling services are effective in assisting cessation for smokers who are ready to quit. **Level II**

Recommendation

Referral to such services should be considered for this group. **Strength A**

References

National Health and Medical Research Council (NHMRC). A guide to the development, evaluation and implementation of clinical practice guidelines. Canberra: NHMRC; 1999.

US Preventive Services Task Force; United States Department of Health and Human Services. Guide to clinical preventive services: report of the US Preventive Services Task Force. 2nd ed. Washington (DC): US Department of Health and Human Services; 1996.

2. Introduction

Australia has made major progress in tobacco control with population prevalence of smoking falling substantially since the 1960s. Daily smoking nearly halved from 24% in 1991 to 12.8% in 2013. While there has been a slowing in the rate of decline with little change in prevalence from 2013 to 2016 (12.2%) (AIHW NDSH 2017), Australia has one of the lowest smoking rates in the Organisation for Economic Cooperation and Development (OECD) countries (AIHW AH 2016). In recent years smoking rates have also fallen for Aboriginal and Torres Strait Islander people (hereafter Indigenous Australians), but remain unacceptably high. (AIHW NDSH 2017; AIHW 2011; ABS 2016) Australia has not met the 2018 National Tobacco Strategy target to reduce the national smoking rate to 10% of the population and halve the Indigenous smoking rate over the 2009 rate in the same time. (Aust Gov NTS 2012-2018) Despite the decline in prevalence, smoking remains the behavioural risk factor responsible for the highest levels of preventable disease and premature death. (AIHW BOD4 2016; Drope 2018) The task of further reducing the number of Australians who are using tobacco requires a collaborative effort between government, health authorities, health professionals and the community at large.

Australia is a signatory to the WHO Framework Convention on Tobacco Control, a worldwide effort to control the effects of tobacco smoking on human health. (WHO 2005) The framework commits governments to enacting a minimum set of policies proved to curb tobacco use, including:

- a ban on tobacco advertising, promotion and sponsorship
- clear warning labels
- smoke free policies
- higher prices and taxes on tobacco products
- access to, and availability of, smoking cessation services
- international cooperation in dealing with cigarette smuggling and cross-border advertising.

Australia was the first country to introduce plain packaging of tobacco products in 2012; several other countries have since enacted plain packaging laws.

Tobacco control involves preventing uptake, supporting cessation and harm reduction strategies. Health professionals play a key role, and have a particular responsibility to assist all people who smoke to stop. (Stead 2013; Fiore 2011; Mullins 1999; Richmond 1999)

Supporting smoking cessation: a guide for health professionals is a practical, succinct and evidence-based resource for use by a wide range of health professionals working in a variety of contexts. The recommendations are based on research evidence and informed by guidelines from other countries with similar

populations. The guide encourages health professionals to offer smoking cessation advice to all people who smoke consistent with materials and support services provided through telephone Quitlines operating in each state and territory. It supports the momentum for cessation gained by public health interventions such as tax increases, restrictions on smoking in public places, changes to tobacco display and the introduction of plain packaging and the social marketing of smoking cessation. The guide also covers the ongoing debate around the role of tobacco harm reduction strategies.

Since the guidelines were first published in 2004, there have been developments in both the science and practice of cessation support. These include advances in our understanding of the neurobiology of nicotine addiction, new medicines such as bupropion and varenicline, substantial changes in the use of nicotine replacement therapy (NRT), the emergence of e-cigarettes and novel strategies such as online and text-based cessation support programs. Smoking cessation medicines (bupropion, varenicline and NRT) have been listed on the Pharmaceutical Benefits Scheme (PBS) with special provision for Indigenous Australians. To keep pace with these changes, the guidelines have been reviewed and updated in 2012, 2014 and 2018.

Readers of this guide who want to know more about tobacco use and tobacco control measures, including summaries of what is known about the effectiveness of smoking cessation, can access the resource *Tobacco in Australia* at www.tobaccoinaustralia.org.au

Tobacco smoking: the scope of the problem

Prevalence and trends

- One in 10 deaths around the world is caused by tobacco use.(WHO 2017)
- In 2016 alone, tobacco use caused over 7.1 million deaths worldwide, with many of these deaths occurring prematurely.(GBD 2017; Drope 2018) That figure is expected to rise to 10 million deaths per year by the 2020s or early 2030s, with 70% of those deaths occurring in developing countries.(WHO 2015)
- In Australia, the prevalence of smoking is among the lowest of any OECD nation.(OECD 2017)
- In Australia there was a greater proportion of people never taking up smoking in 2016 compared with 2013 (AIHW NDSHS 2017)
- Indigenous Australians are still more than three times as likely as non-Indigenous Australians to be current daily smokers. (AIHW 2011) However, there has been a progressive decrease in daily smoking rates for Indigenous Australians, declining from 49% in 2002 to 39% in 2014–15.(ABS 2016)

- Tobacco smoking was responsible for almost a quarter (23%) of the health gap between Aboriginal and Torres Strait Islander people and non-Indigenous Australians.(AIHW BOD7 2016)

Key findings from the 2017 National Drug Strategy Household Survey (AIHW 2017)

- 1 in 8 Australians smoke daily and 6 in 10 have never smoked.
- Smoking rates have been on a long-term downward trend since 1991, but the daily smoking rate did not significantly decline over the most recent 3-year period (was 12.8% in 2013 and 12.2% in 2016).
- Among current smokers, 3 in 10 (28.5%) tried to quit but did not succeed and about 1 in 3 (31%) do not intend to quit.
- Smoking rates were higher in rural than urban areas (13.6% in major cities, 23.8% in remote areas of Australia).

As a result of changes in public policy and changing community attitudes to tobacco, the status of tobacco smoking has shifted from a socially acceptable behaviour to an antisocial one. (Scollo 2017)

Harms associated with smoking

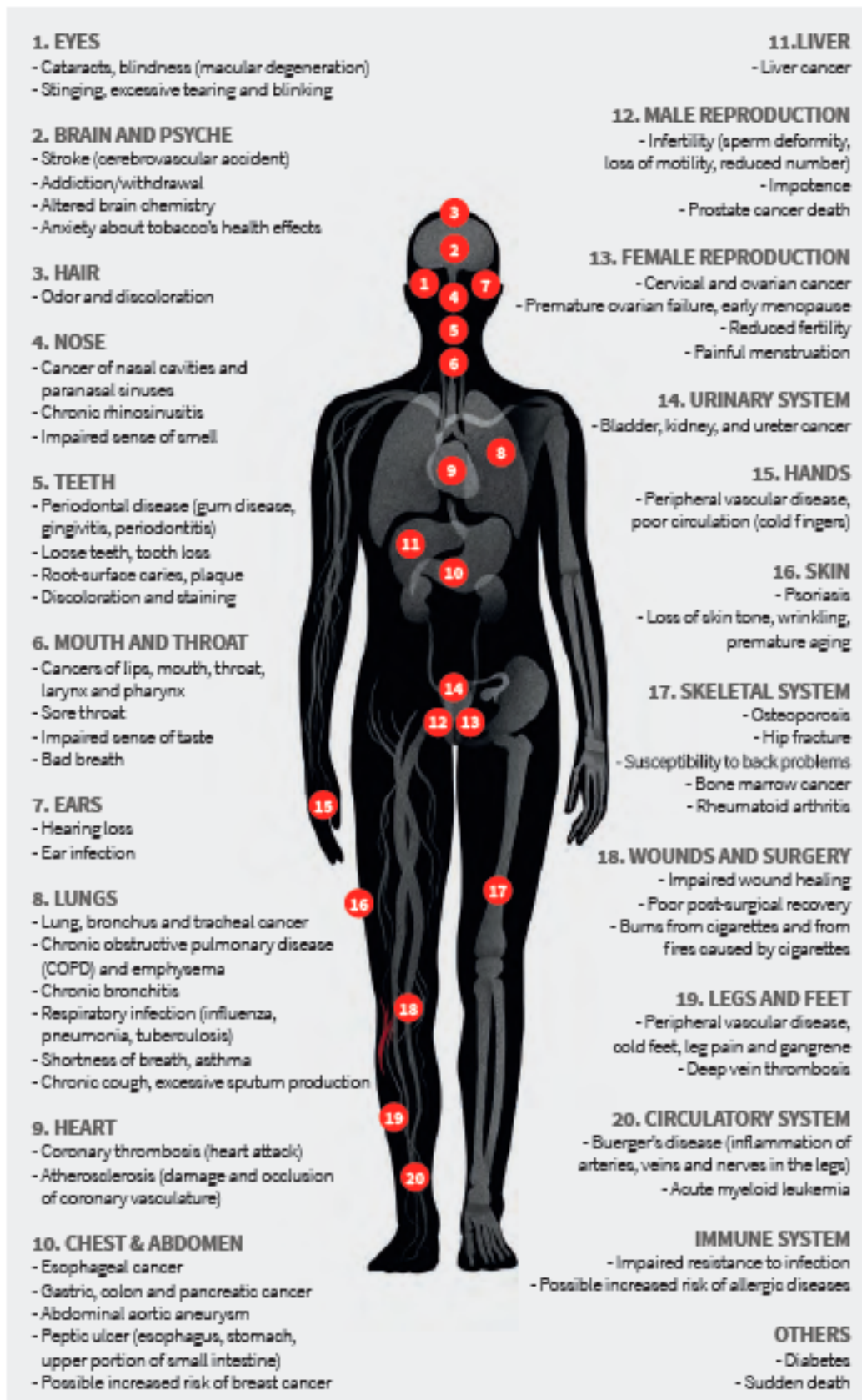
Smoking causes a higher burden of disease than any other behavioural risk factor, representing 9% of the total burden of disease in 2011. (AIHW BOD4 2016) Tobacco smoking is responsible for the deaths of almost 18 762 Australians each year (AIHW BOD4 supplementary tables Ch 6 2016) and smoking-related disease contributes as a comorbidity to many more.(Collins 2008)

In 2011 tobacco use contributed to the burden of disease for (AIHW BOD4 2016):

- 36% of respiratory diseases
- 22% of cancers
- 12% of cardiovascular diseases
- 3.5% of endocrine disorders.

Tobacco smoking harms almost every organ of the body, causing a wide range of diseases and harming the health of smokers (Figure 1).(US Department of Health and Human Services 2010; Drope 2018)

Figure 1. Health effects of smoking (Drope 2018)

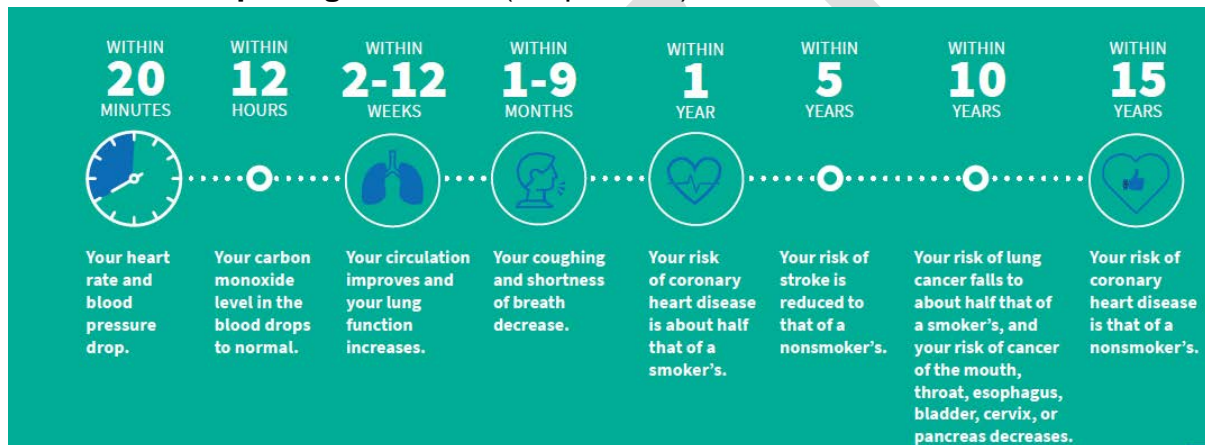


Exposure to secondhand smoke has been shown to damage the health of unborn babies, infants, children and adults:

- Infants: sudden infant death syndrome (SIDS);
- Children: asthma; impaired lung function; respiratory symptoms; middle ear disease
- Adults: coronary heart disease; lung cancer; nasal irritation; stroke; reproductive effects in women; low birth weight babies.

Quitting smoking has immediate, as well as long-term benefits, reducing the risks for diseases caused by smoking and improving physical and mental health. If it occurs early enough, successfully quitting smoking can result in a difference of up to 10 years in life expectancy. (Doll 2004)

The effects of quitting over time (Drope 2018)



Harms associated with smoking in pregnancy

Smoking has adverse effects in pregnancy, both for the mother and the developing fetus. As well as the serious long-term health consequences for the mother, tobacco smoking during pregnancy is the most common preventable risk factor for pregnancy complications, and is associated with poorer perinatal outcomes, including low birthweight, being small for gestational age, pre-term birth, perinatal death, placental abruption, sudden infant death, cleft palate, cleft lip and childhood cancers. (Fiore 2008; Holbrook 2016; Australian Gov CPG 2018) Long-term health effects for the child of maternal smoking during pregnancy include neurodevelopmental and behavioural problems, obesity, hypertension, type 2 diabetes, impaired lung function, asthma and wheezing. (England 2017; Banderali 2015) While the rate of smoking during pregnancy in Australia is falling, approximately 10% of women continue to smoke during pregnancy. (AIHW Mothers and babies 2017)

Effectiveness of treating tobacco dependence

Smoking cessation is both cost and clinically effective compared with other medical- and disease-preventive measures, such as the treatment of hypertension and

hypercholesterolaemia. (Comuz 2006; Ekpu 2015; Parrot 2004; Shearer 2006; Vos 2010) Along with childhood immunisation and aspirin use with high-risk adults, overall efforts to reduce tobacco smoking are among the most beneficial preventive interventions for human health. (Scollo 2017; Vos 2010; Maciosek 2006; WHO 2009) Research shows that the cost per life year saved by smoking cessation interventions makes it one of the most cost-effective healthcare interventions.(Comuz 2006;Vos 2010)

Advice from health professionals including doctors, nurses, pharmacists, psychologists, dentists, social workers, other allied health staff and smoking cessation specialists helps smokers to quit.(Stead 2013;Brown 2016; Carr 2012; Rice 2017) While spending more time (longer than 10 minutes) advising smokers to quit yields higher abstinence rates than minimal advice,(Fiore 2008) offering brief advice (as little as 3 minutes) has been shown to have clear benefits.(Stead 2013; Litt 2003; Richmond1998) On a population level, providing brief advice to most smokers is more effective and efficient than spending a longer time with a few patients.(Litt 2003; Van Schayck 2008)

Advice-based help and pharmacotherapy can increase the rate of success of quit attempts, and when they are used the benefits are cumulative.(Fiore 2008)

The most effective way to quit is with advice and support from a health professional combined with smoking cessation pharmacotherapy (Stead 2013). People who smoke should be offered treatment at every opportunity, which is customised to their own needs and experience.

Quit attempts

Tobacco dependence is a chronic condition that typically requires repeated cessation treatment and ongoing care. (Fiore 2008; Steinberg 2008) A minority of people who smoke achieve long-term abstinence on the first attempt to quit, while the majority cycle through multiple attempts with relapse and remission before achieving long-term or permanent abstinence. Multiple attempts over a period of years are not unusual – the average 40-year-old smoker will have made around 20 unsuccessful 24-hours or more duration quit attempts, most without any external help. The average smoker makes at least one failed attempt per year; some make a lot more and some people rarely try. Smokers can learn something from each quit attempt to help overcome tobacco dependence. (Borland 2012; Cooper 2011)

While many smokers have succeeded in quitting without assistance (Chapman 2010), most people who smoke now use some form of help (Cooper 2011). The decision to try to quit unassisted should be respected and supported (Partos 2013) but smokers should be informed that making use of assistance will increase their chance of quitting successfully. Offering support is especially important for smokers

who have tried multiple times without long-term success. Smokers who are more nicotine-dependent are more likely to both need and seek treatment. (Shiffman 2008)

The role of health professionals

Health professionals from all disciplines can play an important role in supporting smoking cessation. All health professionals should systematically identify smokers and offer them advice and cessation treatment (or referral) at every opportunity. (Brown 2016; Carr 2012; Rice 2017; Richmond 1993; Stead 2013)

Health professionals should aim to capitalise on teachable moments in a patient's life where action about tobacco use is particularly relevant:

- presentation for tobacco-related diseases
- during or after hospitalisation
- preparing for surgery before, during pregnancy and after the birth of a child.

In addition there are visits where more detailed assessment and documentation of smoking should occur such as new patient visits and at routine check-ups.

There is a range of evidence-based strategies that can improve the implementation of effective smoking cessation intervention in the medical practice setting. (Litt 2010; RACGP Green 2018; van den Brand 2017; Zwar 2008) Providing a systematic approach to smoking cessation is associated with higher levels of success. (Fiore 2008) Routine enquiry through waiting room surveys (Litt 2010; McIlvain 2000) or use of additional practice staff to provide counselling is associated with higher quit rates. (Rice 2017) Where health professionals are not able to offer support or treatment within their own practices, they should refer smokers for help elsewhere. In Australia options are Quitline, online programs (such as www.quitcoach.org.au, www.icanquit.com.au. and an emerging group of tobacco treatment specialists coordinated by the Australasian Professional Society on Alcohol & other Drugs (apsad.org.au). In some states there are local programs that provide other options.

Barriers to health professionals providing smoking cessation advice

Barriers raised by health professionals to engaging in greater efforts to provide smoking cessation advice include: (Richmond 2010; Zwar 2006)

- a perception that it is ineffective
- lack of time
- lack of smoking cessation skills
- reluctance to raise the issue due to perceived patient sensitivity about smoking
- perceived lack of patient motivation
- lack of confidence in providing smoking cessation advice.

Many of these barriers are based on incorrect assumptions or can be overcome. Evidence in relation to these beliefs and barriers is presented in Table 1.

Table 1. Beliefs and barriers raised by health professionals to offering smoking cessation advice

Belief / Barrier	Evidence to the contrary
Assistance with smoking cessation is not part of my role	Most patients think smoking cessation assistance is part of your clinical role (Richmond 1993; Richmond 1996)
I have counselled all my smokers	Only 45–71% of smokers are counselled (Litt 2005; Quinn 2005)
Smokers aren't interested in quitting	Nearly all smokers are interested in quitting although some are temporarily put off by past failures. More than 40% of smokers make quit attempts each year and more think about it (Borland 2012)
I routinely refer patients for smoking cessation assistance	Referrals to Quitline are low (10–25%) (Boldemann 2006)
I'm not effective	Clinicians can achieve substantial quit rates over 6–12 months, 12–25% abstinence, which have important public health benefits (Stead 2013; Richmond 2006; Borland 2008) ²
Smokers will be offended by enquiry	Visit satisfaction is higher when smoking is addressed appropriately (Quinn 2005; Sciamanna 2004)
I don't have time to counsel smokers	Effective counselling or referral can take as little as a minute (Fiore 2008)
Quitting smoking worsens mental illness	Quitting does not generally cause deterioration of mental illnesses such as depression, schizophrenia or post-traumatic stress disorder (Taylor 2014)

The 3As structure for smoking cessation

The previous guide recommended the 5As approach (Ask, Advise, Assess, Assist and Arrange follow-up) originally proposed by the US Clinical Practice Guideline. (Fiore 2008) It involves identifying all smokers, assessing nicotine dependence and barriers to quitting, advising them to quit, offering quitting assistance and arranging follow-up. The approach is adopted in full or as a modified form in the majority of international smoking cessation guidelines.(Verbiest 2017)

When referring smokers to other services for assistance to quit we recommend using the 3As structure (Ask, Advise, Act), a simplified form of the 5As approach for providing brief intervention to all smokers. This brief intervention can be delivered in a short time reducing one of the key barriers to health professionals' providing smoking cessation advice.

The 3As approach (Figure 2) can be summarised as follows:

- **Ask** and record smoking status
- **Advise** patient of personal health benefits of quitting
- **Act** on patient's response by offering referral for treatment.

The 5As approach, as recommended in previous editions of these guidelines, is applicable when the health professional is providing assistance personally or within the practice. Where possible, health professionals should maintain long-term and ongoing relationships with people who smoke in order to foster the person's motivation and confidence to attempt smoking cessation.

Recommendation 1

Smoking cessation advice from health professionals is effective in increasing quit rates. The major effect is to help motivate a quit attempt. **Level I.**

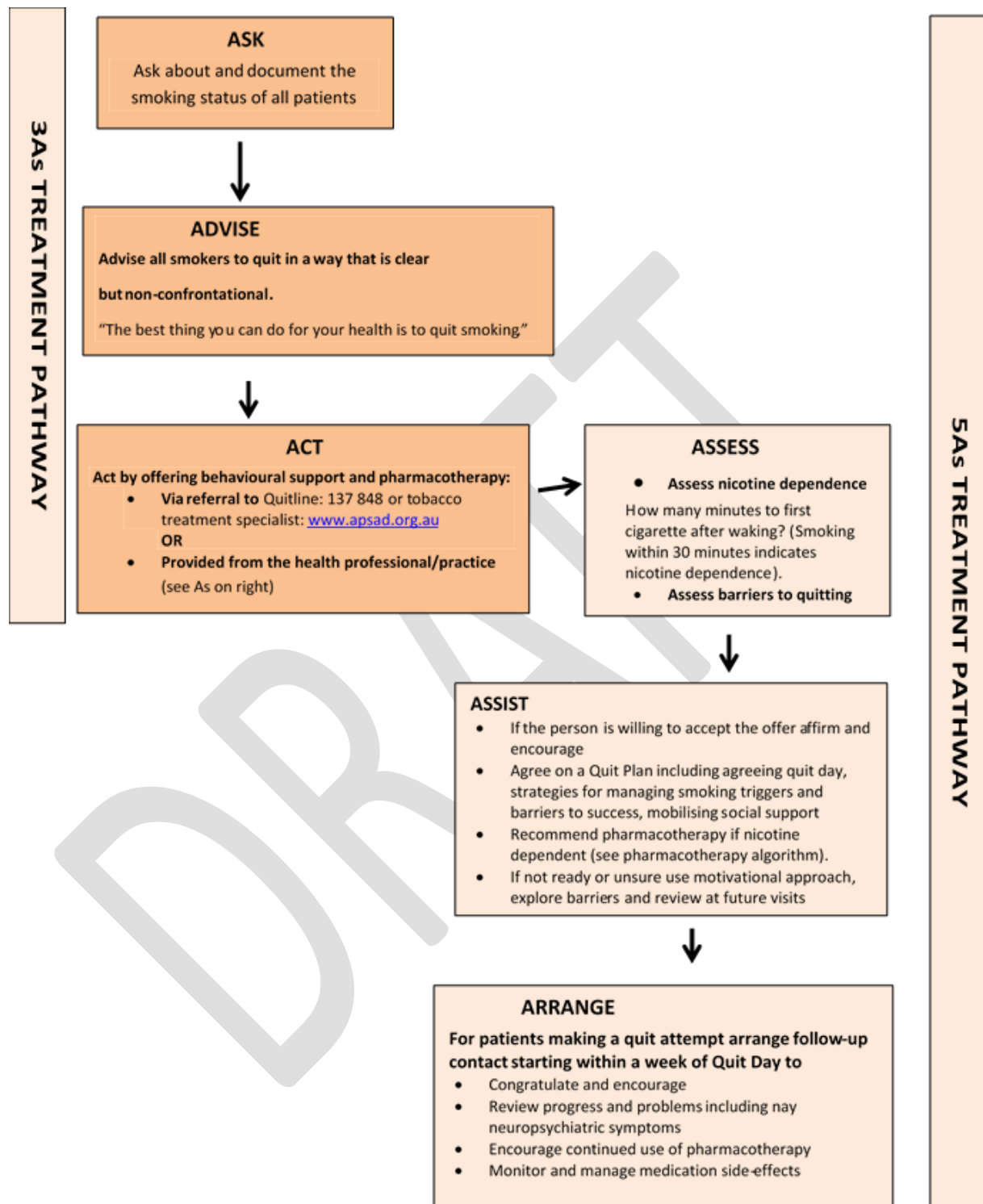
All health professionals can be effective in providing smoking cessation advice.

Level I

Recommendation

All smokers should be offered brief advice to quit. **Strength A**

Figure 2. 3As (referral) and 5As (in-practice) pathways for smoking cessation (attached as appendix)



1. Ask

Ask all patients about smoking

ASK

Ask about and document the smoking status of all patients

Health professionals should ask all their patients whether they smoke tobacco and their status should be recorded. Implementing recording systems that document tobacco use almost doubles the rate at which clinicians intervene with smokers and results in higher rates of smoking cessation.(Fiore 2008) For known smokers, try to continue a conversation about their smoking at each visit, even if it is just an offer to discuss options and importance of action at a subsequent visit. It is important for health professionals to be non-judgmental when asking about smoking.

Recommendation 2

Evidence

Instituting a system designed to identify and document tobacco use almost doubles the rate of health professional intervention and results in higher rates of cessation.

Level II

Recommendation

A system for identifying all smokers and documenting tobacco use should be used in every practice or healthcare service. **Strength A**

2. Advise

Advise all smokers to quit

ADVISE

Advise all smokers to quit in a way that is clear but non-confrontational.

“The best thing you can do for your health is to quit smoking.”

Health professionals should advise patients who smoke to quit and where possible, personalise the advice and the benefits of quitting. Establishing rapport and asking permission minimises any risk of harming the patient–health professional relationship. In fact, asking if smokers would like to have help to quit can be appreciated and can strengthen the relationship.(Butler 2002)Patients express

greater visit satisfaction when smoking cessation is addressed. (Sciamanna 2004; Solberg 2001)

Brief, repeated, positive reminders to quit by a range of health professionals can increase success rates.(Fiore 2008)

Recommendation 3

Evidence

Brief smoking cessation advice from health professionals delivered opportunistically during routine consultations has a modest effect size, but substantial potential public health benefit. **Level I**

Recommendation

Offer brief cessation advice in routine consultations and appointments whenever possible (at least annually). **Strength A**

3. Act

Act by offering behavioural support and pharmacotherapy

ACT

Act by offering behavioural support and pharmacotherapy:

- **Via referral to** Quitline: 137 848 or tobacco treatment specialist: www.apsad.org.au
- OR
- **Provided from the health professional/practice**

Act by offering active referral to the Quitline or other evidence-based support service. The use of medication with behavioural support is associated with improved outcomes compared with unaided quitting. (Kotz 2014). Therefore a medical or nurse practitioner has an important role even if behavioural support is provided outside the practice.

Providing quitting support through your practice (using the 5As structure)

Comprehensive support for quitting within the practice rather than via referral involves substituting Act for the more intensive approach of **Assessment** (of nicotine dependence and barriers to quitting), **Assistance** with behavioural support and pharmacotherapy and **Arranging** follow-up to try to reduce occurrence of relapse.

Assessment of nicotine dependence

The majority of smokers are nicotine dependent and for these people smoking can be conceptualised as a chronic medical illness requiring ongoing care.(Foulds 2010) As nicotine dependence is under-recognised by clinicians, routine assessment of

nicotine dependence can help predict whether a smoker is likely to experience nicotine withdrawal on stopping smoking,(Fidler 2011; Borland 2010) and the intensity and type of support that may be required to assist quitting.

A quick assessment of nicotine dependence can be made by asking the smoker:(Fagerstrom 2003)

- How soon after waking do you have your first cigarette?
- Have you had cravings for a cigarette, or urges to smoke and withdrawal symptoms when you have tried to quit?

Smoking within 30 minutes of waking, smoking more than 10 cigarettes per day (although some dependent smokers may not be daily smokers) and a history of withdrawal symptoms in previous attempts to quit are all indicators of nicotine dependence.

Time to first cigarette has been shown to be the most reliable single indicator of nicotine dependence. Since cigarettes per day became a measure of dependence, a combination of public health and clinical interventions have changed smoking habits in developed countries making it a less robust indicator. As the number of cigarettes per day declines in countries with strong anti-smoking policies, and the fact that smokers underestimate their own consumption level, time to first cigarette has been widely accepted as a more reliable marker of dependence in most people who smoke. (Fagerström 2003)

Assess and address beliefs and barriers to quitting

ASSESS

- **Assess nicotine dependence**

How many minutes to first cigarette after waking?
(Smoking within 30 minutes indicates nicotine dependence).

- **Assess barriers to quitting**

It is important for health professionals to be aware of the potential difficulties smokers face when attempting to quit and to identify and address any mistaken beliefs and attitudes about quitting that a person has at the time of the quit attempt (Table 2).(Onor 2017; Twyman 2014) Support could include providing treatment for withdrawal symptoms or mental health issues, or recommending physical activity and a healthy diet to minimise weight gain. It is also important to recognise the broader influence of social determinates on health behaviours and people's capacity to make health choices.

Table 2. Attitudes and barriers to quitting

Perceived barrier (mistaken beliefs and attitudes)	Evidence-based strategies to address barriers (Balmford 2008; Coleman 2003; Herd 2009)
<ul style="list-style-type: none"> ▪ I can quit at any time ▪ I'm not addicted 	<p>Ask about previous quit attempts and success rates</p>
<ul style="list-style-type: none"> ▪ Using cessation support is a sign of weakness ▪ Help is not necessary 	<ul style="list-style-type: none"> ▪ Reframe support ▪ Explain that nicotine dependence is a powerful addiction ▪ Highlight unsupported quit rate is 3–5%
<ul style="list-style-type: none"> ▪ Too addicted ▪ Too hard to quit ▪ Fear of failure 	<ul style="list-style-type: none"> ▪ Ask about previous quit attempts ▪ Explore pharmacotherapy used and offer options, eg combination therapy
<ul style="list-style-type: none"> ▪ Too late to quit ▪ I might not benefit so why bother? 	<ul style="list-style-type: none"> ▪ Benefits accrue at all ages, and are greater if earlier: at age 30 years, similar life expectancy to non-smoker ▪ Provide evidence and feedback, eg spirometry, lung age, absolute risk score
<ul style="list-style-type: none"> ▪ My health has not been affected by smoking ▪ You have to die of something ▪ I know a heavy smoker who has lived a long time 	<ul style="list-style-type: none"> ▪ State evidence that one in two people who continue to smoke after middle age will die prematurely of smoking related disease ▪ Reframe, eg chronic obstructive pulmonary disease (COPD) = smoker's lung
<ul style="list-style-type: none"> ▪ Not enough willpower ▪ No point in trying unless you want to ▪ To quit successfully you really have to want to, then you will just do it 	<ul style="list-style-type: none"> ▪ Explore motivation and confidence. ▪ Explore and encourage use of effective strategies, eg Quitline, pharmacotherapy
<ul style="list-style-type: none"> ▪ Cigarettes help me relax 	<ul style="list-style-type: none"> ▪ Suggest other relaxation strategies such as breathing techniques and progressive muscle relaxation
<ul style="list-style-type: none"> ▪ Fear of weight gain 	<ul style="list-style-type: none"> ▪ Average weight gain is 2-4 kg. Only about 10% of people have substantial weight gain (more than 13 kg). ▪ Suggest strategies to minimise weight gain: healthy diet, avoid high fat and high sugar foods and drinks; regular physical activity
<ul style="list-style-type: none"> ▪ Peer and social pressure 	<ul style="list-style-type: none"> ▪ Suggest avoidance of high risk social situations early in the quit attempt. For some people it can be helpful to rehearse how to say no to a cigarette offer.

Nicotine withdrawal symptoms

Nicotine withdrawal symptoms commonly include craving for nicotine, as well as onset of other symptoms. The American Psychiatric Association publication DSM-5 defines tobacco withdrawal as abrupt cessation of tobacco use, or reduction in the amount of tobacco used, followed within 24 hours by four (or more) of the following signs or symptoms:

- irritability, frustration, anger
- anxiety
- difficulty in concentration
- increased appetite
- restlessness
- depressed mood
- insomnia.

Under the DSM-5 definition, these symptoms need to cause clinically significant distress or impairment in social, occupational or other important areas of functioning, and not be attributable to another medical condition or better explained by another mental disorder, including intoxication or withdrawal from another substance. (APA 2013)

Other nicotine withdrawal symptoms include:

- craving for sweet or sugary foods
- constipation
- coughing
- dizziness
- dreaming/nightmares
- nausea
- mouth ulcers
- sore throat.

It is important to inform the smoker beginning a first or subsequent quit attempt that they may experience withdrawal symptoms when quitting. Usually, nicotine withdrawal symptoms begin within 24 hours of the last cigarette and are strongest in the first week (for some people only 2 to 3 days). For most people, withdrawal symptoms decline steadily and can disappear after about 2 to 4 weeks. It can take up to 3 months to feel at ease with not smoking. All of these symptoms can occur for other reasons so caution should be exercised in attributing them to nicotine withdrawal.

Nicotine withdrawal symptoms can be reframed as recovery symptoms. Pharmacotherapies will reduce or completely prevent withdrawal symptoms.

Urges to smoke and cravings for nicotine are elements of withdrawal and a strong predictor of relapse. (Greenhaigh 2016) Providing strategies to manage withdrawal is

an essential aspect of the healthcare professional's role:

- Quitline services offer a number of calls, especially in the first few weeks, to help and encourage smokers in a quit attempt to stay on track
- Smoking cessation pharmacotherapies can reduce the severity of withdrawal symptoms
- There is evidence that exercise can help reduce cravings and nicotine withdrawal.

Assist smokers to quit

ASSIST

- If the person is willing to accept the offer affirm and encourage
- Agree on a Quit Plan including agreeing quit day, strategies for managing smoking triggers and barriers to success, mobilising social support
- Recommend pharmacotherapy if nicotine dependent (see pharmacotherapy algorithm).
- If not ready or unsure use motivational approach, explore barriers and review at future visits

The decision on what assistance to provide to smokers and recent quitters depends on their willingness to quit, needs, preferences and suitability of available support, and the capacity of the health professional and their service. This could be advice and support, referral, or a combination of these options. When capacity within the practice is limited, referral to Quitlines can be useful as well as providing support within the practice, including advice on pharmacotherapy.

For people willing to make a quit attempt:

- Help the person develop a Quit Plan including agreeing quit day, strategies for managing smoking triggers and barriers to success, mobilising social support
- Recommend pharmacotherapy if nicotine dependent (see pharmacotherapy algorithm). Consider strategies such as pre-cessation nicotine replacement, combination therapy.
- Discuss importance of follow-up and behavioural support.

If the person is not ready or unsure, use the motivational approach, explore barriers and review at future visits. For further details on smoking cessation strategies, see chapters *Pharmacotherapy for smoking cessation* (page 40) and *Behavioural and advice-based support for smoking cessation* (page 72).

Motivational interviewing

This type of counselling requires more time than brief interventions. Assistance from the health professional may include motivational interviewing. This is an evidence-based counselling technique based on a therapeutic partnership that acknowledges and explores a smoker's ambivalence about smoking behaviour – in a way that

allows the smokers themselves to clarify what goals are important to them and to organise their reasons in a way that supports actions. Motivational interviewing values patient autonomy and mutual respect and uses open-ended questions, affirmations, reflection and summarising.(Lindson-Hawley 2015; Miller 2009; Miller 2012)

For motivational interviewing strategies see Chapter 3. Clinical interventions for tobacco use and dependence, Table B1 in *Treating tobacco use and dependence: 2008 update*. (Fiore 2008)

Arrange follow-up

ARRANGE

For patients making a quit attempt arrange follow-up contact starting within a week of Quit Day to:

- congratulate and encourage
- review progress and problems including any neuropsychiatric symptoms
- encourage continued use of pharmacotherapy
- monitor and manage medication side-effects

Follow-up visits to discuss progress and to provide support have been shown to increase the likelihood of successful long-term abstinence.(Richmond 1986; Richmond 1993) Additional follow-up leads to further increases in smoking cessation rates when compared to no follow-up. (Fiore 2008)

Congratulation and encouragement can help maintain motivation as can affirming the person's decision to quit and reinforcement of the benefits (health, social and financial) of quitting and of being a non-smoker. It is important to review progress and identify and seek to address problems. Examine any slips so that more effective coping strategies can be planned. Explain slips as valuable learning experiences, not as failures and encourage to keep trying. Adverse neuropsychiatric symptoms such as anxiety, agitation, poor sleep and low mood can occur during cessation and it is important to identify these symptoms and offer support. Behavioural disturbances and suicidal thoughts can also occasionally occur.

Many people discontinue use of smoking cessation pharmacotherapy prematurely or may need dosage adjustment so review the use of medication: are they taking the medication; are they using it correctly; are they experiencing any side-effects? If NRT is being used and there are withdrawal symptoms, a larger dose or combination NRT may be required.

Discuss relapse prevention. Offer support and help to identify and manage high-risk situations such as drinking alcohol, emotional stress and social situations with smokers. Encourage the smoker to enlist the support of family and friends. Self-

rewards are a useful strategy as smokers often feel deprived when they quit. Encourage use of support services such as Quitline 13 7848 or online programs such as www.quitcoach.org.au and www.iCanQuit.com.au.

Relapse in the first weeks after quitting is common and is often related to nicotine withdrawal. (Rosen 2018) There is a later peak in relapse after discontinuation of smoking cessation medication. Later relapse can be triggered by alcohol, stress and social situations. About 50% of smokers who are still abstinent at 12 months will subsequently relapse. (Yudkin 2003) There is as yet no intervention, including behavioural support or skills training, that is proven to prevent relapse. (Agboola 2010; Hajek 2013) Advice, behavioural counselling and pharmacotherapy are recommended to treat symptoms of withdrawal, stress and weight gain. (Farley 2012) Health professionals should offer ongoing support to all people who have made a quit attempt and need further help to remain smoke free.

Recommendation 4

Evidence

Follow-up is effective in increasing quit rates. **Level I**

Recommendation

All smokers attempting to quit should be offered follow-up. **Strength A**

Tobacco dependence

Nicotine is the main addictive chemical in tobacco smoke. (Royal College of Physicians 2007; US Department of Health and Human Services 2010; Benowitz 2010) It adversely affects the developing brain and causes addiction. Although nicotine is the main chemical making smoking addictive, it is responsible for very few of the harmful health effects of smoking, which are caused mainly by tar, oxidising chemicals, carbon monoxide and other constituents of tobacco smoke generated by the combustion of tobacco leaf. (Scollo 2017; US Department of Health and Human Services 2010; Royal College of Physicians 2007)

Dependence on nicotine can develop quickly especially in adolescent smokers. (DiFranza 2007) Nicotine is one of the most highly addictive substances, perpetuating cigarette and other tobacco product use, hindering smoking cessation efforts and increasing the risk of other substance use and addiction and a number of adverse health consequences. (CasaColumbia 2015; Benowitz 2009).

Dependence on smoking is a complex process. It requires a close link in time between the context in which smoking occurs, its rituals, the sensory stimuli of touch, taste and smell, and the extremely rapid delivery of nicotine to the brain that occurs when smoking a modern cigarette. Evidence suggests that psychosocial, biological

and genetic factors all play a role in nicotine addiction. (US Department of Health and Human Services 2010; Royal College of Physicians 2007; Benowitz 2010).

When cigarette smoke is inhaled, the large surface area of the lungs enables nicotine to be rapidly absorbed into the pulmonary venous circulation and to travel quickly to the brain through the bloodstream. (Benowitz 2008) Nicotine in tobacco smoke reaches the brain reward system within seconds of inhalation. (Tomkins 2001) This nicotine affects multiple types of nicotine receptors in the brain especially the $\alpha 4\beta 2$ nicotinic acetylcholine receptor. Activation of this and other receptors triggers the release of dopamine and other neurotransmitters. This reward system is the common pathway for the experience of pleasure from many different social, physical and chemical stimulants, including other drugs of addiction such as cocaine and opiates. As well as the activation of the reward system, the negative effects of nicotine withdrawal are important factors in the continuation of smoking.



Legend: Healthy lungs (left) are light pink and a smoker's lungs appear dark due to inhaled tar. The texture of damaged lungs is harder and more brittle than healthy lungs

Genetic factors play a role in the differing patterns of smoking behaviour and smoking cessation. The degree of susceptibility to developing tobacco addiction – as well as the ease or difficulty of quitting and sustaining abstinence – has been reported from twin and adoption studies. This research shows a high degree of heritability of cigarette smoking (50–70%). (Vink 2005; Ho 2010) The finding points to an understanding of why smokers vary widely in their relationship to tobacco and their ability to quit. Genetic factors have a substantial role in nicotine withdrawal symptoms, cigarette consumption, difficulty quitting and response to smoking

cessation therapies. (Ho 2010) However, a useful way to target treatment based on genetics has not yet been shown. The studies also indicate that there may be some smokers who never fully overcome their addiction, or who can never quit all nicotine use. (RCP 2007) For these people a harm reduction strategy may be of help (see Harm Reduction page 110).

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DRAFT

3. Pharmacotherapy for smoking cessation

Key points

- Pharmacotherapy should be recommended to all nicotine dependent smokers
- The most successful quit approach for dependent smokers is behavioural support combined with first-line pharmacotherapy and follow-up
- Nicotine replacement therapy, varenicline and bupropion are licensed and available in Australia to assist smoking cessation
- Varenicline is the most effective single form of pharmacotherapy for smoking cessation
- Combination NRT is as effective as varenicline and more effective than single types of NRT
- NRT bought over the counter without behavioural support of any form has a negligible benefit
- Considerations guiding choice of pharmacotherapy for people who smoke wanting to quit are based on evidence of effectiveness, clinical suitability and patient choice.

Three forms of medicine (nicotine replacement therapy, varenicline and bupropion) are licensed and available in Australia to assist smoking cessation. These medicines have been shown to assist smoking cessation in meta-analyses of randomised clinical trials. (Cahill 2016; Hughes 2014; Stead 2012; Aubin 2008)

Pharmacotherapy should be recommended to all nicotine dependent smokers. (Fiore 2008) However, a smoker's choice to attempt to quit without assistance should be respected and supported.

The most successful quit approach for those who are nicotine-dependent is behavioural support combined with first-line pharmacotherapy and follow-up. (Fiore 2008; Foulds 2010; Kotz 2014; Stead 2016; Piper 2016; Zwar 2014) Recent findings suggest that a range of smoker characteristics including the presence of psychological illness, nicotine dependence and prior use of nicotine replacement therapy (NRT) are associated with lower cessation rates, but varenicline, bupropion or NRT improve abstinence rates across the board. Overall, varenicline and combination NRT almost tripled and bupropion and NRT almost doubled the odds of quitting versus placebo at 6 months. (West 2018)

First-line pharmacotherapy options

First-line options are medicines that have been shown to be effective and safe and are licensed for smoking cessation; some are also licensed for smoking reduction as a step towards stopping smoking in people who smoke who are unable or not ready to stop smoking abruptly. In Australia these medicines are NRT, varenicline and sustained-release preparations of bupropion hydrochloride.

From current available evidence, varenicline is the most effective form of single pharmacotherapy for smoking cessation. (Anthenelli 2016; Cahill 2016; NICE 2007; Cahill 2013) A Cochrane collaboration analysis concluded that combination NRT is as effective as varenicline and more effective than single types of NRT.(Cahill 2013) Varenicline has been shown to be more effective than bupropion in a number of studies. Head-to-head comparisons between bupropion and NRT monotherapy have shown these medicines are equivalent to each other in efficacy. (Cahill 2013)

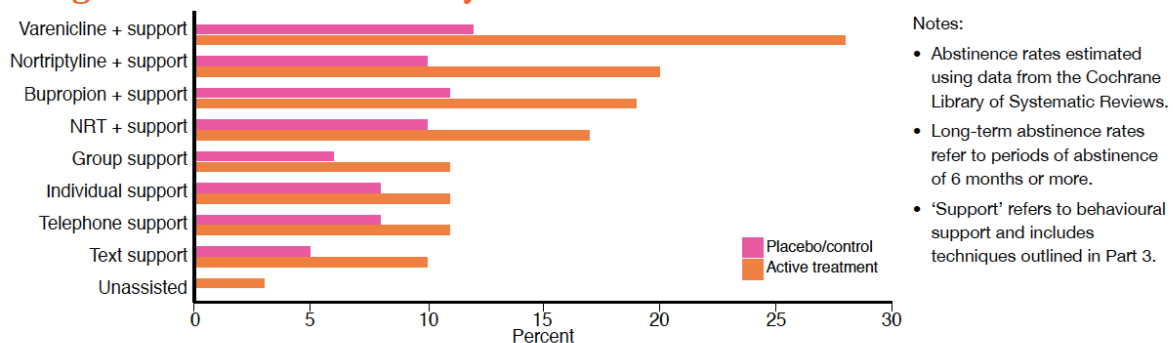
Efficacy of licensed smoking cessation medicine (West 2015)

(All randomised controlled trials were in the context of at least some behavioural support and, for varenicline, intensive behavioural support)

- Varenicline is effective. Its use can increase 6–12-month continuous or sustained abstinence rates by 15% (95% CI=13–17) compared with placebo and 7% (95% CI=4–11) compared with bupropion. It is more effective than nicotine patches
- NRT is effective and can increase 6–12-month continuous abstinence rates by 6% (95% CI=6–7) compared with placebo
- Combining a nicotine patch with a faster-acting NRT (such as gum or lozenge) increases 6–12-month abstinence rates by 5% compared with single-form NRT (95% CI=3–7)
- Bupropion is effective. Its use can increase 6–12-month continuous abstinence rates by 7% (95% CI = 6–9) compared with placebo
- Bupropion appears to be as effective as NRT monotherapy, but evidence from three randomised controlled trials suggests that it is less effective than varenicline

Figure 3. Long-term abstinence rates by treatment method (NZ Gov 2014)

Long-term abstinence rates by treatment method



The choice of pharmacotherapy most likely to assist people who smoke in an attempt to quit is based on evidence of effectiveness, clinical suitability and patient

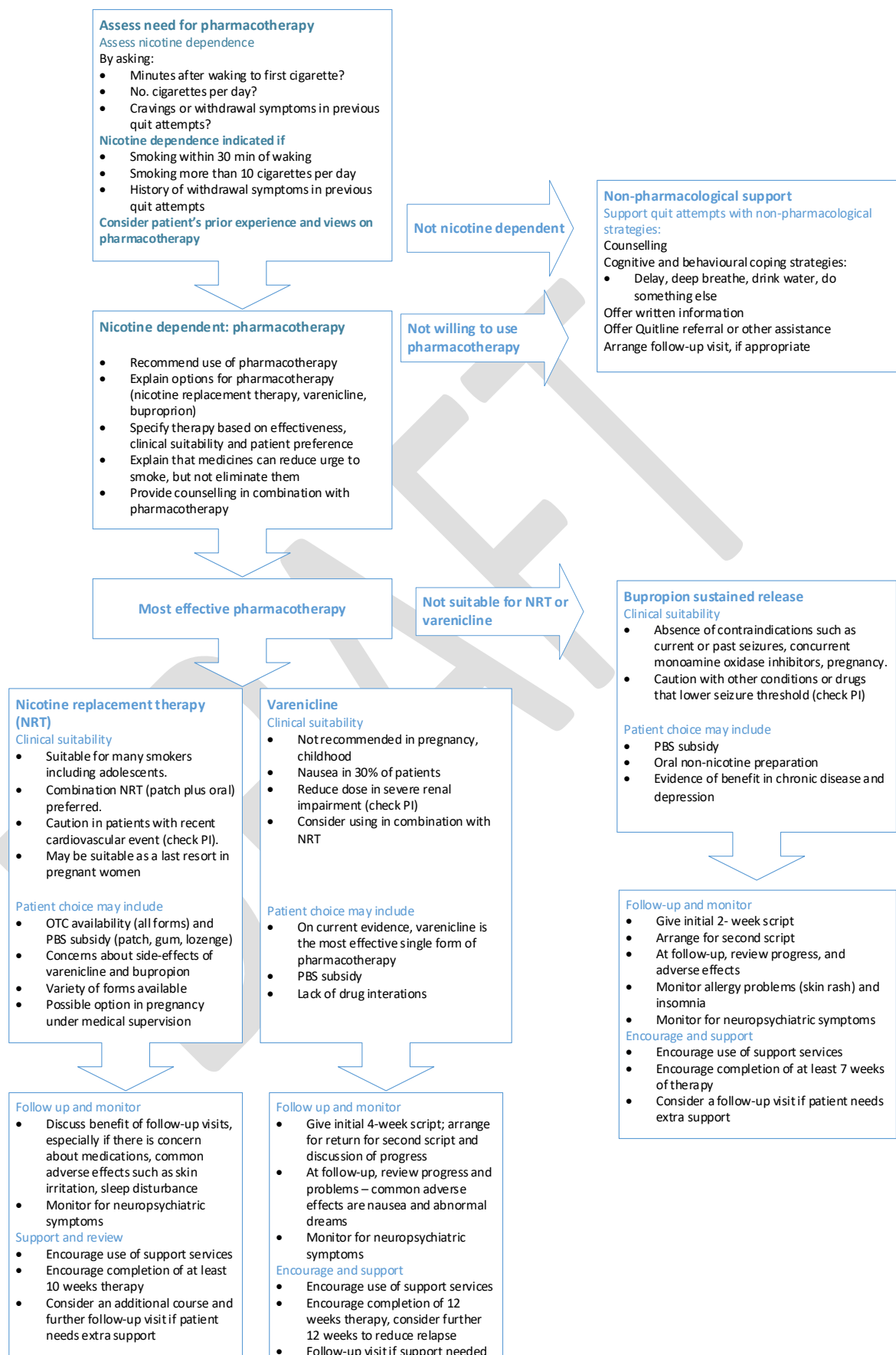
choice (Figure 4.). Considerations when helping a smoker select an appropriate form of pharmacotherapy to quit:

- previous experience with pharmacotherapy
- cost and convenience
- adherence issues - individual preference or need for patch over gum, one or more forms of NRT, non-nicotine options
- prescription medicine vs over-the-counter medicine
- potential for adverse events
- possible drug interactions.

Patients quitting smoking using any method are at some risk of increased psychological stress during the quitting process as a result of nicotine withdrawal symptoms, especially patients with a history of mental illness. (Anthenelli 2016) Clinicians should monitor all patients for anxiety, depression, behaviour changes and suicidality and promptly report adverse events. Clinicians should also inform family members to report any concerning changes.

The date of finishing medication is an important time to reinforce the quitting process to prevent relapse. (Rosen 2018) About 50% of those who are quit at the end of taking pharmacotherapy relapse to smoking, (Fiore 2008) therefore combining pharmacotherapy and behavioural intervention is important.

Figure 4. Pharmacotherapy treatment algorithm



Recommendation 5

Evidence

Pharmacotherapy with nicotine replacement therapy, varenicline or bupropion is an effective aid to assisting motivated smokers to quit. **Level I**

Recommendation

In the absence of contraindications, pharmacotherapy should be offered to all motivated smokers who have evidence of nicotine dependence. Choice of pharmacotherapy is based on efficacy, clinical suitability and patient choice.

Strength A

Nicotine replacement therapy

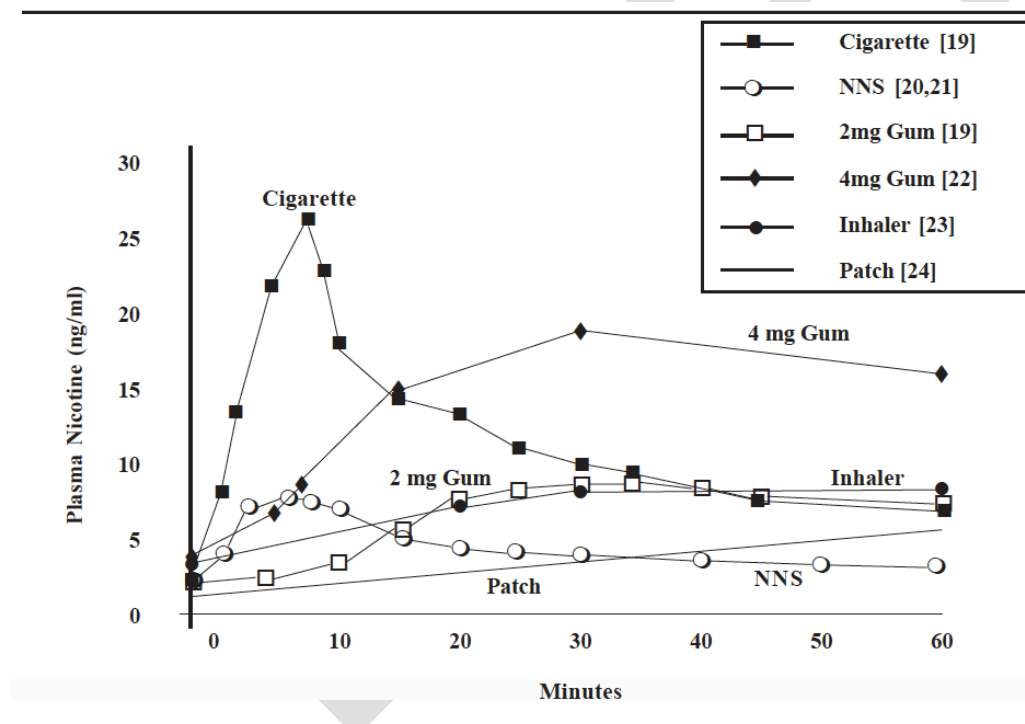
Key points

- Smoking cessation using NRT to quit is always less harmful than continuing to smoke
- When used correctly, all forms of NRT (at equivalent doses) are similarly effective in achieving long-term cessation
- All forms of NRT monotherapy can increase the rate of quitting by 50–60%
- More than one form of NRT can be used concurrently with increased success rates and no greater safety risks
- Higher-dose forms of nicotine gum (4 mg) are more effective than lower dose forms (2 mg) for more dependent smokers
- Nicotine patches can be commenced several weeks before smoking cessation to help smokers prepare for quitting
- NRT can be used by people with cardiovascular disease. Caution is advised for people in hospital for acute cardiovascular events, but if the alternative is active smoking, NRT can be used under medical supervision
- NRT may be considered in pregnancy if women have been unsuccessful in stopping smoking without pharmacotherapy. If NRT is used, the benefits and risks should be explained carefully to the woman by a suitably qualified health professional and the clinician supervising the pregnancy should be consulted
- NRT accompanied by behavioural interventions can be used by smokers aged 12–17 years.

Nicotine is the main substance in tobacco that causes addiction – it makes people dependent on cigarettes – but it is the other chemicals in combusted tobacco products that cause cancer, accelerate heart disease and affect other areas of health. While nicotine also has the potential for adverse effects in vulnerable developmental life stages including pregnancy, childhood and adolescence, (McEvoy 2017; England 2017; Warren 2013) it is considered to be a safer alternative to tobacco.

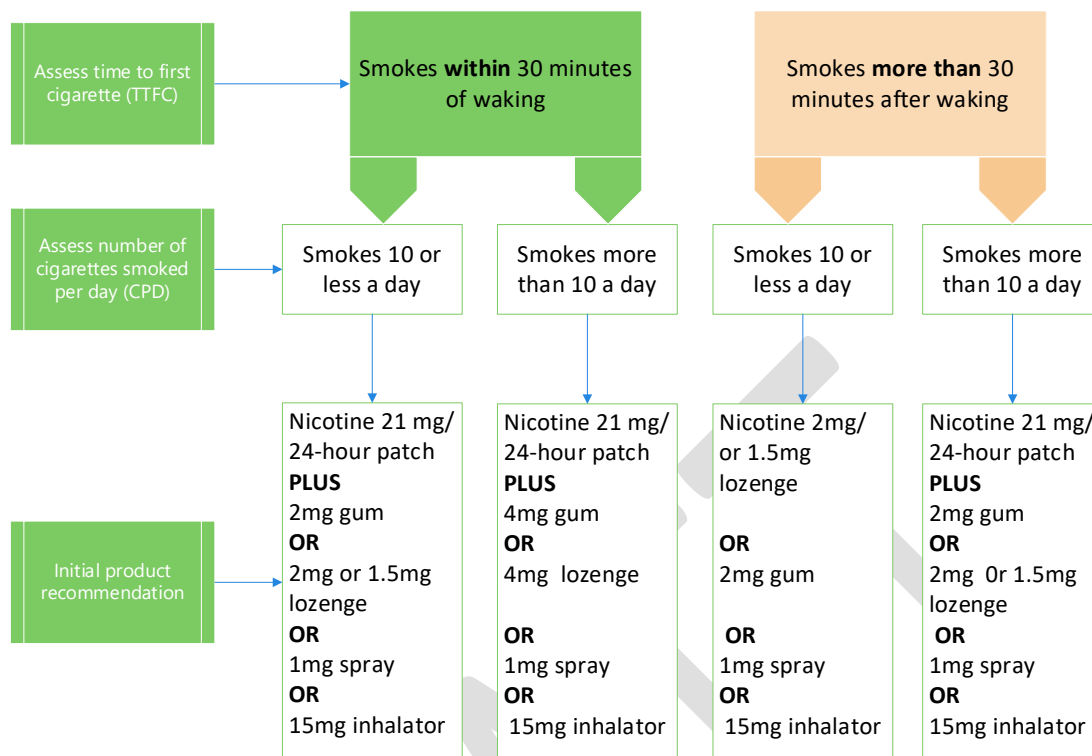
The aim of NRT is to reduce craving and withdrawal symptoms by providing some of the nicotine that would normally be obtained from cigarettes, without providing the harmful components of tobacco smoke. NRT provides lower doses of nicotine at a slower rate than cigarette smoking: none of the available forms of NRT (transdermal patch, gum, inhalator, lozenge and mouth spray) offer the same rapid nicotine delivery of a cigarette. (Onor 2017) Nicotine patches are applied to the skin and deliver nicotine through the skin at a relatively steady rate. Other nicotine products including gum, lozenges, inhalators and mouth sprays are acute dosing forms of nicotine. They provide relief for general craving and breakthrough craving with faster release of nicotine. The main advantage of nicotine patches over acute NRT formulations is that patient adherence is simple. However, patches deliver nicotine more slowly than acute NRT formulations (Figure 5). The advantage of acute-dosing NRT is that both the amount and timing of doses can be titrated by the person who smokes.

Figure 5. Plasma nicotine concentrations for cigarettes and different forms of nicotine replacement therapy (NRT) (Schneider 2004)



It is important to advise smokers on the correct use of the different forms of NRT and to ensure that an adequate dose is taken to relieve cravings and withdrawal symptoms (Figure 6). Under dosing is a recognised problem with current NRT; smokers wanting to quit often do not use enough NRT to obtain the best clinical effect.

Figure 6 Nicotine replacement therapy (NRT) initial dosage guideline



Patients should be reassured about the safety, efficacy and low addictive potential of NRT, as misinformed concerns in smokers are a major cause of poor adherence. (Mendelsohn 2013; Ferguson 2012)

Regular use of NRT beyond 12 months is not generally recommended as there is no evidence of efficacy beyond 24 weeks. (Schnoll 2015) At the 24-week point, the prospect of stopping NRT can be confronting for some who do not feel ready to stop treatment. An extended but not limitless period of treatment may be reasonable for such patients although there are no data to support this approach. Current scientific evidence does not support an association between long-term NRT exposure and serious adverse health effects (Lee 2017; Schnoll 2015) – it may help some people remain abstinent (Anthonisen 2005) and it is less harmful than smoking.

While there is evidence that NRT can increase quit rates with or without counselling, (Piper 2016; Stead 2012) research suggests NRT bought over the counter appears to be associated with reduced success rates. More research is needed on the effectiveness of NRT in this context. (Kotz 2014)

Recommendation 6

Evidence

Nicotine replacement used as monotherapy increase quit rates by 50–70% at 5–12 months follow-up compared with placebo, and regardless of the setting. **Level I**

Recommendation

NRT should be recommended to nicotine-dependent smokers. There is no significant difference in effectiveness of different forms of NRT in achieving cessation, so choice of product depends on clinical suitability and patient preference. **Strength A**

Combination NRT

Combining two forms of NRT (patch plus intermittent form, such as spray, gum, inhalator or lozenge) has been shown to be more efficacious than a single form of nicotine replacement. (Cahill 2013; Shah 2008) The patch provides a steady background nicotine level and the intermittent forms provide additional protection for breakthrough cravings. Oral doses can be taken on a regular, say hourly basis, in anticipation of triggers (gum, lozenge or inhalator) or when cravings occur (mouth spray). Combination NRT has been recommended for all dependent smokers, rather than monotherapy, including use of higher dose forms of oral products for those who need them. (Stead 2012)

Combination NRT can be recommended as first-line treatment, (Fiore 2008; Aubin 2008) or for smokers unable to quit using one NRT product alone, or for those who experience cravings using only one form of NRT (Figure 6). The evidence review conducted by the Joanna Briggs Institute (JBI) on this question identified 12 randomised trials with a total of 6318 participants. The relative effect was 1.28 (95% CI 1.15 – 1.42). The Expert Advisory Group (EAG) rated the certainty of the evidence as moderate. The EAG concluded there is a small but not trivial improvement in smoking cessation for combination NRT compared to single NRT. Studies only included smokers with at least low to moderate nicotine dependence.

Recommendation 7 (GRADE)

For people who smoke, are wanting to quit and are currently receiving behavioural support, clinicians should recommend combination NRT over single NRT.

Strong recommendation; moderate certainty

Higher-dose NRT

Higher-dose oral NRT (4 mg gum and lozenge) and higher-dose patches (21 mg / 24 hour patch and 25 mg /16 hour patch) are recommended for more dependent smokers (those who smoke within 30 minutes of waking) and should also be considered for less dependent smokers who continue to report cravings when using the weaker form. (Stead 2012; Shiffman 2013) Higher-dose therapy with the patch is also possible by adding a second patch. This approach has been shown to be safe and produce a modest (14%) increase in quit rates. (Stead 2012)

Pre-cessation nicotine patch

There is evidence to support use of the nicotine patch before smoking cessation (preloading). A meta-analysis found that the nicotine patch used before quit day increased success rates compared to standard therapy (Shiffman 2008) and a Cochrane review found a 34% increased effect from pre-cessation patch use. (Stead 2012) The Therapeutic Goods Administration (TGA)-approved approach involves using either a 21 mg / 24-hour patch or a 25 mg / 16-hour patch for 2 weeks before quitting, then continuing to use the nicotine patch in the usual way for the quit attempt and adding intermittent NRT if needed.

Reduce to quit

There is also evidence for use of NRT to help smokers who are not willing to quit immediately to reduce their tobacco use and then progress to quitting. (Lindson-Hawley 2012) The TGA-approved approach (cut down then stop or reduce to quit) involves smokers using NRT to prevent compensatory smoking (inhaling deeper on fewer cigarettes) when reducing the number of cigarettes they smoke before stopping completely within 6 months. A meta-analysis found that reducing cigarettes smoked before quit day versus quitting abruptly with no prior reduction produced comparable quit rates. (Lindson-Hawley 2012; Wang 2008) Further research is needed to investigate those categories of smokers who benefit the most from each method. (Lindson-Hawley 2014)

Tapering off NRT

Advice to wean off NRT over a period of weeks is included in the Product Information of these products but it is not something that is supported by the evidence. The main issue is sufficient duration of NRT, not whether tapering occurs before the medicine is ceased.

Longer treatment duration

There is limited evidence of benefit from longer NRT treatment duration.

Two randomised-controlled trials have compared longer (up to 52 weeks) to standard courses (8 weeks) but found no convincing effect from the longer course. (Schnoll 2010; Schnoll 2015)

Another use of longer duration NRT is for relapse prevention in those smokers who are abstinent at the end of a standard course of treatment or who have abstained unassisted. A systematic review of 4 trials found that prolonged use of NRT was effective at medium term (12 to 18 months follow-up). (Agboola 2010). The evidence review conducted by JBI on this question found only one trial that met inclusion criteria which included abstinence confirmed by exhaled CO concentration < 8 ppm. The relative effect was 2.17 (95% CI 0.85-2.17). The EAG rated the certainty of the evidence as low.

Recommendation 8

Recommendation: For people who have abstained from smoking at the end of a standard course of NRT, clinicians may consider recommending an additional course of NRT for sustained abstinence.

Conditional recommendation for or against the intervention; low certainty

Contraindications and precautions

There is no safe level of smoking. Using therapeutic nicotine is always less harmful than continuing to smoke.

Contraindications

There are few contraindications associated with NRT use. These include:

- Children under 12 years of age
- People with known hypersensitivity to nicotine or any other component of the NRT product.

Note: People weighing less than 45 kg can use NRT but may require the lower dose such as a 14 mg/24-hour patch.

Precautions

NRT should be used with caution for patients in hospital for acute cardiovascular events, but if the alternative is smoking, NRT can be used under medical supervision.

Side-effects

Minor side-effects are common with NRT use. (NPS Medicinewise 2011) Common adverse effects with NRT depend on the delivery system. Patches can cause skin irritation, redness, itch and rash. This is usually mild, but can be treated with 1% hydrocortisone cream if troublesome. It is important to rotate the application site each day to reduce irritation. Insomnia and vivid dreams can also occur, but tend to improve with time. However, if severe, patients can remove the patch at bedtime or a couple of hours before retiring and re-apply a new patch in the morning.

For gum and lozenges, minor side-effects include dyspepsia and nausea, and for the inhalator and mouth spray, mouth and throat irritation may occur. (Richmond 2010)

Use of NRT in cardiovascular disease

All forms of NRT can be used safely in stable cardiovascular disease, (Benowitz 2018) but should be used with caution in people with recent (within last 6 weeks) myocardial infarction, unstable angina, severe arrhythmias and recent cerebrovascular events. NRT can be used in this situation under medical supervision. (Benowitz 2018; Mendelsohn 2013)

Recommendation 9

Evidence

There is no evidence of increased risk for use of NRT in people with stable cardiovascular disease. **Level II**

There is no evidence of an association between use of nicotine patch and acute cardiac events. **Level II**

Recommendations

NRT is safe to use in patients with stable cardiovascular disease. **Strength A**
NRT should be used with caution in patients who have had a recent myocardial infarction, unstable angina, severe arrhythmias or recent cerebrovascular events.

Strength C

Use of NRT in pregnancy

Given the importance of smoking cessation in pregnancy, every effort should be made to support the mother to quit. Behavioural counselling is recommended as the first-line treatment in pregnancy. Behavioural intervention can increase the proportion of women who stop smoking in pregnancy, the proportion of infants born with low birthweight and reduce smoking cessation after birth (Chamberlain 2017) (see page 90 *Smoking cessation in high prevalence populations: pregnant and breastfeeding women*). Pregnant women should be encouraged to use Quitline, which in some states has special programs of support which extend into the postpartum period when risk of relapse to smoking is high.

There is inconclusive evidence of the effectiveness and safety of NRT during pregnancy and other forms of pharmacotherapy are contraindicated. (U.S. Department of Health and Human Services 2010; Coleman 2015) A Cochrane review and meta-analysis of eight studies and 2199 participants found that NRT as an adjunct to behavioural support was effective for smoking cessation in pregnancy (risk ratio (RR) 1.41, 95% confidence interval (CI) 1.03 to 1.93) however there was no significant difference in cessation rates in a subgroup analysis of placebo-controlled studies. However, some observational studies suggest effectiveness in clinical practice. (Brose 2013; Pollack 2007). The modest impact of NRT could be due to inadequate dosing as nicotine clearance is increased by 60% in pregnancy. (Dempsey 2002) Poor adherence is also likely to cause reduced cessation outcomes. (Coleman 2012)

Though nicotine has been linked to harmful effects on the fetus in animal studies, clinical trials have not reported adverse effects from NRT in humans. The Cochrane meta-analysis found no significant difference in health and safety outcomes in four studies. Several studies found no adverse effect on birth weight. (Lassen 2010; Coleman 2012). One study found that infants born to mothers who received NRT had a significantly higher rate of unimpaired development when assessed 2 years after delivery (Cooper 2014). However because of the small number of studies,

further evidence is needed before firm conclusions on safety can be made. (Bar Zeev 2018; Mendelsohn 2014)

The evidence review conducted by JBI examined the outcome of smoking cessation in later pregnancy. The review identified eight randomised controlled trials involving 2199 participants that met entry criteria. The relative effect was 1.41 (95% CI 1.03-1.93). The EAG rated the certainty of the evidence as low. The review found no evidence of an increase in adverse effects (miscarriage, stillbirths, preterm birth, low birthweight, neonatal care unit admission, neonatal death) in women treated with NRT. In fact all comparisons showed lower rates of these effects in the NRT-treated patients, however it should be noted that the 95% confidence interval for all risk ratios included 1 (no effect). The EAG concluded that on current evidence there are important improvements in smoking cessation outcomes associated with use of NRT in pregnancy while there does not appear to be an increase in harms.

If quit attempts are unsuccessful without the use of medications, and the woman is motivated to quit, pharmacotherapy (usually oral forms of NRT) should be considered only if the increased likelihood of quitting outweighs the harmful effects on the fetus of NRT and possible continued smoking. (US Department of Health and Human Services 2010) If NRT is used, the benefits and risks should be considered and explained carefully to the woman by a suitably qualified health professional and the clinician supervising the pregnancy should be consulted. (Australian Government Department of Health 2018; Bar-Zeev 2018; Baraona 2017) Intense behavioural support and close clinical surveillance of the pattern of any continuing smoking are important.

Recommendation 10

Recommendation: For women who are pregnant who aim to quit smoking, clinicians might recommend NRT as compared to no NRT.

Conditional recommendation for or against the intervention; low certainty

Use of NRT in breastfeeding

Nicotine passes from the mother to child through breast milk, depending on the concentration of nicotine in the maternal blood, but the nicotine in breast milk is likely to be less harmful than continued smoking. (Benowitz 2004; Ilett 2003) NRT (patch or intermittent NRT) is considered an option for breastfeeding mothers. (Sachs 2013) Infant exposure to nicotine can be reduced further by taking intermittent NRT immediately after breastfeeding.

Women who smoke should be encouraged to continue breastfeeding and provided with strategies to minimise the potential harm to their child through breast milk and from second-hand smoke. (Baraona 2017)

Availability of nicotine replacement therapy on the PBS

Health professionals should check for updated Pharmaceutical Benefits Scheme (PBS) listings at www.pbs.gov.au

Nicotine patches (25 mg/16 hours, 15 mg/16 hours, 5 mg/16 hours, 21 mg/24 hours, 14 mg/24 hours, 7 mg/24 hours) are listed on the PBS for use as an aid to quitting for people who participate in a support and counselling program. A maximum 12 weeks of PBS-subsidised nicotine patches is available per 12-month period. A streamlined authority prescription is required.

The subsidised patches are not available at the same time as other PBS subsidised smoking cessation therapies (varenicline and bupropion), but if people are unsuccessful quitting using the nicotine patches, then they are able to access PBS-subsidised medicines during that same 12-month period.

Oral forms of NRT subsidised on the PBS include gum and lozenges for use as monotherapies. Other forms of oral NRT must be purchased over the counter.

All forms of NRT are available over the counter in pharmacies and in supermarkets in Australia.

Aboriginal and Torres Strait Islander people

Aboriginal and Torres Strait Islander people qualify for PBS restricted benefit listing, that provides up to two courses per year of nicotine patches, each of a maximum of 12 weeks. Under this listing, participation in a support and counselling program is recommended but not mandatory. Nicotine gum (2 mg and 4 mg doses) and lozenge (2 mg and 4 mg doses) are also available on the PBS for Indigenous people. The PBS listing does not cover two forms of NRT at once (combination therapy). Access to NRT for Indigenous people can be facilitated through the Closing the Gap PBS Co-payment measure (see page 88).

Varenicline

Key points

- Varenicline is a nicotinic receptor partial agonist drug for smoking cessation which relieves symptoms of craving and withdrawal
- It can more than double the chances of long-term quitting
- In a Cochrane meta-analysis it was found to be more effective than bupropion, more effective than NRT monotherapy and similar in effect to combination NRT
- Varenicline can be used in smokers with mental health problems but they must be monitored during quit attempts and advised to report unusual mood changes, depression, behaviour disturbance and suicidal thoughts and if these occur to stop using the medicine
- Varenicline is not recommended for pregnant and breastfeeding women and for adolescents
- There are two options for quitting with varenicline: the fixed or flexible quit date option, both equally effective but chosen by preference. The fixed option involves the smoker setting a date to stop smoking. Varenicline should start 1–2 weeks before this date
- Alternatively, a flexible approach to quitting smoking may be adopted. Smokers can begin varenicline dosing and then quit smoking between days 8 and 35 of treatment
- Longer-term use (a second 12-week course) reduces relapse for up to one year in people who have successfully quit at the end of week 12.

Varenicline was developed specifically for smoking cessation. It acts at the nicotinic acetylcholine (ACh) receptor in the reward centre in the brain. Varenicline binds with high affinity at the $\alpha 4\beta 2$ nicotinic ACh receptor, where it acts as a partial agonist to alleviate symptoms of craving and withdrawal. At the same time, if a cigarette is smoked, the drug prevents inhaled nicotine from activating $\alpha 4\beta 2$ receptor antagonist activity sufficiently to block the pleasure and reward response. This mechanism may explain why quitting can occur later in a course of treatment with varenicline.

Efficacy

Varenicline at a standard dose can more than double the chances of successful long-term smoking cessation compared with pharmacologically unassisted quit attempts. (Cahill 2016; Wu 2006) A Cochrane meta-analysis of 27 trials of varenicline found it more than doubled sustained abstinence rates at 6 months' follow-up. (Cahill 2016) Varenicline monotherapy was also more effective than NRT monotherapy at 24 weeks (Cahill 2016) but of similar efficacy to combination NRT (patch and oral form). (Cahill 2013)

Two studies have tested varenicline as an aid to relapse prevention in smokers who had successfully quit on varenicline. One study continued treatment for an additional 12 weeks, the other for an additional 40 weeks. There was a modest benefit in favour of extended treatment compared to the placebo groups. (Cahill 2016) The benefit appears to be maintained only for the period of use of varenicline.

The evidence review conducted by JBI on this question found two trials involving 1297 participants that met entry criteria (including biochemically confirmed cessation). The relative effect was 1.23 (95% CI 1.08-1.41). The EAG rated the certainty of the evidence as low.

Recommendation 11

For people who smoke, who are wanting to quit and who are currently receiving behavioural support, clinicians may consider a further course of varenicline to prevent relapse.

Conditional recommendation for or against the intervention; low certainty

Varenicline improves smoking cessation rates 2-fold over bupropion, and almost 4-fold when compared to placebo, and is well tolerated (Gonzales 2006; Jorenby 2006).

There is increasing evidence of the efficacy of varenicline in special populations.

People with mental illness

Psychiatric comorbidity is common in smokers and varenicline has been found to be safe and effective in smokers with stable mental illness or a past history of mental illness. (Anthenelli 2013) There is also evidence that varenicline is safe and effective to assist cessation in people with schizophrenia. (Williams 2012; Pachas 2012)

Women

Varenicline is more effective than other cessation monotherapies, but in women the difference is relatively greater. Women have lower quit rates with NRT and bupropion compared to men but the same response to varenicline. (Smith 2017)

People who smoke who are heavy drinkers

Varenicline reduces alcohol cravings and overall alcohol consumption in heavy drinkers and may have a role in the concurrent treatment of alcohol and nicotine dependence, especially in men. (O'Malley 2018; McKee 2013; Mitchell 2012)

Combination varenicline and other pharmacotherapy for smoking cessation

There is limited evidence on the use of varenicline in combination with other therapies. Varenicline can be combined with NRT and bupropion.

Varenicline in combination with the NRT patch results in significantly higher abstinence rates than varenicline alone. (Koegelenberg 2014; Ramon 2014) Chang et al. (2015) aggregated the reported number of adverse events from these studies, and generated pooled Odds Ratios with a fixed-effect model. Compared to mono-varenicline therapy (varenicline and placebo patch alone), participants receiving combination varenicline and NRT reported more incidents of nausea (28.4 % vs 25.7 %; OR 1.15 (CI 0.85, 1.56)), insomnia (18.7 % vs 15.4 %; OR 1.27 (0.89, 1.80)) and abnormal dreams (13.6 % vs 10.7 %; OR 1.20 (0.78, 1.84)). Frequency of headaches was similar between groups (7.1 % vs 7.8 %; OR 1.01 (0.60, 1.72)). The study of Koegelenberg et al. (2014) reported that skin reactions (of any type) were more prevalent in the combination therapy group (14.4 % vs 7.8 %; $p = 0.03$).

The evidence review conducted by JBI on this question found two trials involving 787 participants that met entry criteria (including biochemically confirmed cessation). The relative effect was 1.62 (95% CI 1.18-2.23). The EAG rated the certainty of the evidence as moderate. The EAG concluded that on current evidence there is a small but not trivial improvement in smoking cessation for people taking varenicline in addition to NRT compared to NRT alone.

Recommendation 12

Recommendation: For people who smoke who are wanting to quit, clinicians might recommend the use of varenicline in combination with NRT as compared to varenicline alone.

Conditional recommendation; moderate certainty

There have been no clinical studies of varenicline combined with oral NRT. However, in clinical practice, these medications are sometimes used together. Varenicline helps to relieve background cravings and reduce the stimulatory effects of smoking and oral NRT products alleviate cue-induced triggers.

There is a lack of evidence of effectiveness of the combination of varenicline plus bupropion. One study found a benefit at 26 weeks, but not at 52 weeks while a more recent study found no benefit at either of these follow-up points. (Ebbert 2014; Cinciripini 2018)

Safety

Varenicline and mental illness

After initial marketing of varenicline, there were concerns about an association between varenicline and mood changes, depression, behaviour disturbance and suicidal ideation. Subsequent meta-analyses of randomised controlled trials (Tonstad 2010; Gibbons 2013) and observational studies (Thomas 2015; Gibbons 2013; Meyer 2013) have not supported a causal link. The large randomised controlled trial, EAGLES (Evaluating Adverse Events in a Global Smoking Cessation

Study), has given further reassurance. (Anthenelli 2016) The study did not find a significant increase in the rates of moderate-to-severe neuropsychiatric adverse events in those taking varenicline compared to those using placebo, bupropion or nicotine patch, in smokers with or without stable mental illness. As expected, those with mental illness in all treatment groups had higher rates of neuropsychiatric adverse events than those without mental illness.

Patients quitting smoking with any method are at some risk of increased psychological stress, especially those with a history of mental illness. Clinicians should monitor all patients with follow-up for neuropsychiatric changes associated with withdrawals, whether taking varenicline or not, and should promptly report any adverse events.

Cardiovascular safety of varenicline

Safety data from over a dozen more recent randomised controlled trials, including one conducted in the highest-risk patient population studied to date, examining the use of varenicline for smoking cessation suggest that cardiovascular events are rare and not likely to be increased by the use of varenicline. (Sterling 2016) The findings are consistent with the results of several large cohort studies, which found no increased risk of cardiovascular adverse events between varenicline and bupropion for smoking cessation. (Toh 2013; Svanstrom 2012) There appears to be no substantive evidence to suggest that varenicline increases the risk of cardiovascular adverse events. (Benowitz 2018; Sterling 2016)

It is important to note that smoking is a major risk factor for cardiovascular disease, and the health benefits of quitting smoking are immediate and substantial. (Hackshaw 2018).

Due to the limited efficacy and pregnancy safety data, varenicline is not recommended as a smoking cessation aid for pregnant or breastfeeding women. (Turner 2018)

Side-effects

Nausea is the most common adverse effect of varenicline and was reported in studies of almost 30% of smokers, although less than 3% discontinued treatment due to nausea. (Gonzales 2006; Jorenby 2006) There is some evidence that nausea can be minimised by taking tablets with food, titration and self-regulation of varenicline (dosages used between 0.5-2mg/day). (Niaura 2008; Oncken 2006) Lower doses of varenicline are also effective if the full dose cannot be tolerated. (Cahill 2016)

Sleep disturbance and abnormal dreams were more common in the varenicline group (13.1%) than either the bupropion (5.9%) or placebo groups (3.5%). (Gonzales 2006; Jorenby 2006)

Other less common side-effects include drowsiness, headache, constipation, dizziness and flatulence.

No clinically meaningful drug interactions have been identified.

Varenicline is excreted almost entirely by the kidneys. For people with creatinine clearance below 30 mL/min, the recommended daily dosage is 1 mg/day (0.5 mg/day for 3 days then increasing to 1 mg/day). Avoid varenicline in end-stage renal failure in favour of other approaches to smoking cessation. Dose adjustment is not routinely required in elderly people or in people with hepatic impairment. (PI Pfizer Australia Pty Ltd. 2013)

Recommendation 13

Evidence

Varenicline is an efficacious smoking cessation treatment. **Level I**

Recommendation

Varenicline should be recommended to smokers who have been assessed as clinically suitable for this medication and should be provided in combination with counselling. **Strength A**

Availability of varenicline on the PBS

Health professionals should check for updated PBS listings at www.pbs.gov.au

Varenicline is available in Australia on the PBS as short-term adjunctive therapy for nicotine dependence. It can be prescribed as a streamlined prescription for up to 24 weeks of continuous therapy for smoking cessation for smokers who are enrolled in a support and counselling program and who are abstinent at 12 weeks. Making use of the Closing the Gap PBS co-payment can further reduce the cost for Indigenous Australians.

The first script is a starter pack lasting 4 weeks (including dose titration), followed by a continuation batch for 8 weeks of treatment.

A third prescription is required for a final 12 weeks of treatment, for those who respond to the first 12 weeks. The medicine should be taken whole with water, and food can help to reduce nausea.

Bupropion

Key points

- Bupropion is a non-nicotine oral therapy, originally developed as an antidepressant
- It significantly increases cessation rates compared with placebo
- Bupropion has been shown to be less effective than varenicline for smoking cessation
- Bupropion is contraindicated in patients with a history of seizures, eating disorders and those taking monoamine oxidase inhibitors
- Bupropion is not recommended for pregnant or breastfeeding women
- Bupropion should be used with caution in people taking medications that can lower seizure threshold, such as antidepressants, antipsychotics, antimalarials and oral hypoglycaemic agents

Originally developed as an antidepressant, bupropion is a non-nicotine oral therapy that reduces the urge to smoke and reduces symptoms from nicotine withdrawal.

Efficacy

Bupropion significantly increases the long-term cessation rate by about 60% compared with placebo over 12 months. (Hughes 2014)

It has been shown to be effective in a range of patient populations including smokers with depression, cardiac disease and respiratory diseases including COPD. (Richmond 2003) It has also been shown to improve short-term abstinence rates for people with schizophrenia. (Tsoi 2013; Evins 2005) In comparison to NRT, varenicline and placebo, bupropion has not been shown to cause an increase in neuropsychiatric adverse events, including in people with a history of mental health disorders. (Anthenelli 2016)

Clinical trials have shown that bupropion is not as effective as varenicline. However, bupropion is a useful option in cases where varenicline is not appropriate (patient choice, or as a result of side-effects).

Combination bupropion and other pharmacotherapy for smoking cessation

The combination of NRT and sustained-release bupropion has not shown an additive benefit. (Hughes 2014). As previously stated there is a lack of evidence of effectiveness of the combination of bupropion plus varenicline. (Ebbert 2014; Cinciripini 2018)

Safety

Bupropion is contraindicated in patients with a history of seizures, eating disorders and those currently taking monoamine oxidase inhibitors or within the last 14 days. The current recommendation is that it should be used with caution in people taking medications that can lower seizure threshold, such as antidepressants, antipsychotics, antimalarials and oral hypoglycaemic agents. (Hughes 2014) Alcohol consumption should be minimised or avoided completely if a smoker is taking bupropion as quitting medication because alcohol can alter the threshold at which bupropion induces seizures. A sudden decrease in alcohol consumption can also alter the seizure threshold. Alternative medication should be considered in these situations.

Caution is needed if there is concomitant use of bupropion with drugs such as tricyclic antidepressants and selective serotonin reuptake inhibitors. These drugs should be initiated at the lower end of the dosage range while a smoker is taking bupropion. In the more common situation that bupropion is initiated for a person already taking such antidepressants then the dose of tricyclic, or selective serotonin reuptake inhibitor, may need to be decreased. Bupropion should not be used in patients taking monoamine oxidase inhibitors (MAOIs) including moclobemide. A 14-day washout is recommended between completing MAOIs and starting bupropion. Consultation with a psychiatrist may be considered for advice on co-prescribing bupropion with other antidepressants. (Lucas 2013; UK Medicines Information 2017)

There is no evidence that the use of bupropion for smoking cessation increases the risk of serious cardiovascular adverse events during or after treatment. (Benowitz 2018) Due to the limited efficacy and pregnancy safety data, bupropion is not recommended as a smoking cessation aid for pregnant or breastfeeding women. (Turner 2018)

Side-effects

Seizures are the most clinically important adverse effect (0.1% risk) and fatalities have been reported. Common adverse effects are insomnia, headache, dry mouth, nausea, dizziness and anxiety. (Richmond 2003) If bupropion is used in combination with NRT, blood pressure should be monitored. (Richmond 2003)

Recommendation 14

Evidence

Bupropion sustained release is an efficacious smoking cessation treatment. **Level I**

Recommendation

Bupropion sustained release should be recommended to smokers who have been assessed as clinically suitable for this medication and provided in combination with counselling. **Strength A**

Availability of sustained release bupropion on the PBS

Health professionals should check for updated PBS listings at www.pbs.gov.au

Since 2001, sustained-release bupropion has been available in Australia as a PBS streamlined authority item once per year. It is a short-term adjunctive therapy for nicotine dependence in conjunction with counselling with the goal of maintaining abstinence. Making use of the Closing the Gap PBS co-payment can further reduce the cost for Aboriginal and Torres Strait Islander people.

Bupropion is available as a starter pack of 30 tablets and a continuation pack of 90 tablets. The dose of bupropion is 150 mg once per day for the first 3 days and then increased to 150 mg twice per day. The patient should stop smoking in the second week of treatment.

Other pharmacotherapy options

Nortriptyline

The tricyclic antidepressant, nortriptyline, has been shown in a relatively small number of trials and participants, to significantly increase long-term cessation when used as the sole pharmacotherapy. (Wu 2006; Hughes 2014) A systematic review shows that the use of nortriptyline for smoking cessation resulted in higher prolonged abstinence rates after at least 6 months, compared to placebo treatment. (Wagena 2005) The efficacy of nortriptyline does not appear to be affected by a past history of depression, but it is limited in its application by its potential for side-effects including dry mouth, constipation, nausea, sedation and headaches, and a risk of arrhythmia in patients with cardiovascular disease. Nortriptyline can be dangerous in overdose.

Nortriptyline is not registered for smoking cessation in Australia.

The dose of nortriptyline used for smoking cessation is approximately 75 mg a day for 12 weeks. Further information about nortriptyline for smoking cessation can be obtained from New Zealand Smoking Cessation Guidelines. (NZ Ministry of Health 2014)

Recommendation 15

Evidence

Nortriptyline is an efficacious smoking cessation treatment in people with and without a history of depression. **Level II**

Recommendation

Nortriptyline should only be considered as a second line agent due to its adverse effects profile. **Strength B**

Electronic cigarettes

Electronic cigarettes (e-cigarettes) are battery-powered devices that deliver nicotine in a vapour without tobacco or smoke. The device heats a liquid into an aerosol for inhalation, simulating the behavioural and sensory aspects of smoking. The liquid is usually made up of propylene glycol and glycerol, with or without nicotine and flavours, stored in disposable cartridges or refillable tanks. The nicotine content of e-cigarettes can vary from zero to doses up to 50 mg/mL. E-cigarette users are referred to as vapers and e-cigarette use as vaping. (Hartmann-Boyce 2018)

The use of e-cigarettes to support cessation is controversial. As they have only been on the market for a short period and they are continually changing, their long-term safety is unknown. (Hartmann-Boyce 2016; Byrne 2018; Evans 2018) Concerns about e-cigarettes include:

- a lack of high-level evidence for efficacy for smoking cessation
- a lack of evidence on health effects, particularly in the long-term
- continued concurrent use with smoking (dual use) or acting as a gateway to tobacco use
- the potential to promote nicotine use and renormalise smoking among non-smokers, especially young people. (Eaton 2018)

To date, there are only two completed randomised controlled trials of e-cigarettes for smoking cessation with follow-up at 6 months or longer. (Hartmann-Boyce 2016). These two studies compared e-cigarettes containing nicotine to placebo. Participants using an e-cigarette were more likely to have abstained from smoking for at least six months compared with participants using placebo e-cigarette (RR 2.29, 95% CI 1.05 to 4.96; placebo 4% versus EC 9%; 2 studies; 662 participants. GRADE: low). The one study that compared e-cigarettes to nicotine patch found no significant difference in six-month abstinence rates, but the confidence intervals did not rule out a clinically important difference (RR 1.26, 95% CI 0.68 to 2.34; 584 participants. GRADE: very low).

An evidence review conducted by JBI examined trials comparing nicotine containing e-cigarettes versus nicotine replacement therapy for biochemically validated smoking cessation. The review identified 3 randomised trials with a total of 1498 participants. The relative effect was 1.28 (95% CI 1.15 – 1.42). The follow-up in these studies ranged from 8 weeks to 52 weeks. The EAG rated the certainty of the evidence as low. The EAG concluded there is a moderate improvement in smoking cessation for nicotine containing e-cigarettes compared to NRT.

The technology of e-cigarettes delivery devices is rapidly changing and studies in progress with more recent models may show different results. While there are still only a small number of randomised trials, the potential benefit of e-cigarettes for assisting cessation is supported by population studies which have reported that

smokers who use vaporisers are more likely to try to quit and are more likely to quit successfully than smokers who don't vape. (Zhu 2017; Johnson 2018)

When used for smoking cessation the most common side-effects are dry mouth and throat irritation. No serious adverse effects were reported among the 24 studies in the Cochrane review. (Hartmann-Boyce 2016). The JBI review examined adverse effects reported from trials and population studies. JBI concluded that overall, nicotine containing e-cigarette usage is associated with the occurrence of some mild adverse effects. The most common are coughing; dry/irritated mouth/throat; nausea and insomnia. The review further concluded that the occurrence of these AEs are comparable to the rates of AEs experienced when participants were using either NRT, convention cigarettes or placebo e-cigarettes. When the EAG examined the evidence of adverse effects the group noted the lack of standardisation of e-cigarette devices and nicotine containing e-liquids. Given this the group concluded that the risk of adverse effects remained unknown

Recommendation 16 (GRADE)

Recommendation: E-cigarettes are not first line treatments. The strongest evidence base of efficacy and safety is for currently approved pharmacological therapies combined with behavioural support. Patients should be reminded that successful quitting often takes a number of attempts and a range of strategies are available to maximise the benefit of approved therapies. The lack of tested and standardised e-cigarettes products creates an uncertain environment for both patients and clinicians and development of a suitable regulatory process is urgently needed. However, for people who have tried to achieve smoking cessation with approved pharmacotherapies but failed, are still motivated to quit smoking and have brought up e-cigarette usage with their healthcare practitioner, e-cigarettes may be a reasonable intervention to recommend. However, this needs to be preceded by an evidence-informed shared-decision making process, whereby the patient is aware of the following caveats:

1. Due to the lack of available literature, the long-term health effects of vaping are unknown.
2. E-cigarettes are currently not regulated in Australia and therefore the constituents of the vapour they produce has not been tested.
3. There is a lack of uniformity in delivery devices and the e-liquid constituents which increases the uncertainties associated with their usage.
4. In order to maximise possible benefit and minimise risk of harms short-term use only should be recommended
5. Dual use (that is, with continued tobacco smoking) needs to be avoided.

Conditional recommendation for either the intervention or the comparison

These products are not approved for therapeutic use in Australia and sale of nicotine-containing e-cigarettes is illegal in all states and territories. Nicotine solution

for e-cigarettes is only legally available with a prescription which can be filled by a compounding pharmacy or it can be imported. Practitioners should exercise caution in deciding whether it is in the patient's best interest to prescribe nicotine for inhalation as a smoking cessation aide.

There is ongoing debate about a potential role for e-cigarettes in harm reduction for people who do not want to give up tobacco or nicotine use completely (see Harm Reduction page xx).

Clonidine

Based on a small number of trials, clonidine is more effective than placebo in promoting smoking cessation. (Gourlay 2004) Prominent side-effects including postural hypotension, extreme drowsiness, fatigue and dry mouth limit the usefulness of clonidine for smoking cessation. (Sandweiss 2018)

Clonidine is not registered for smoking cessation therapy in Australia.

Future options

A number of other tobacco cessation therapies are available or in development. (Gómez-Coronado 2018; Elrashidi 2014)

Cytisine

Cytisine, a naturally occurring substance chemically related to varenicline, has been used for smoking cessation for decades in parts of Eastern Europe. (Zatoński 2015) A Cochrane meta-analysis concludes that cytisine increases the chances of quitting, although absolute quit rates in two recent trials were modest. (Cahill 2016) A New Zealand study found that cytisine combined with brief behavioural support was superior to NRT in helping smokers quit smoking, but it was associated with a higher frequency of self-reported adverse events. (Walker 2014)

Cytisine is not currently TGA approved or available in Australia.

Vaccines

Antinicotine vaccines have been in development for a number of years. The rationale for immunisation against nicotine is to induce antibodies that bind nicotine in the blood, thereby preventing it from crossing the blood–brain barrier. It is postulated that with less nicotine reaching the brain immediately after smoking, the vicious cycle between smoking and nicotine-related gratification will be broken. The vaccines must be administered regularly to maintain long-term protection. Early preclinical trials evaluating different vaccines were encouraging but to date no study has detected a statistically significant difference in long-term cessation between vaccine and placebo. (Hartmann-Boyce 2012) Nicotine vaccines are not yet licensed anywhere in the world for use as an aid to smoking cessation or relapse prevention. (Cahill 2013)

Given that the current available first-line medications are all efficacious, and non-drug factors make a substantial contribution to the likelihood of quitting successfully, (Stead 2012) choice should be based on overall evidence of relative efficacy, clinical suitability and patient preference (Figure 4. Pharmacotherapy treatment algorithm page 43).

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4. Behavioural and advice-based support for smoking cessation

The benefits of quitting smoking are well established. Patients should be advised that unassisted quitting has a very low success rate (less than 2-5%) and professional advice can greatly increase their chances of success. (Fiore 2008; Hughes 2004; Baillie 1995; Borland 2012) Ideally they should be offered the most effective method and use it as soon as possible. The most successful quit approach for those who are nicotine-dependent is counselling and behavioural support combined with first-line pharmacotherapy and follow-up. (Fiore 2008; Tonnesen 2009; Foulds 2010; Zwar 2014; Kotz 2014) Health professionals should offer to assist their patients with a quit attempt, using pharmacotherapy and counselling, either within the health service or by referring them for intensive support to a telephone Quitline (13 78 48), a smoking clinic or health professional with special expertise in smoking cessation.

The following smoking cessation interventions have been proven to be effective.

Brief advice from health professionals

There is strong evidence that advice from health professionals (doctors, nurses, nurse practitioners, Aboriginal health workers, medical assistants, dentists, hygienists, respiratory therapists, mental health counsellors, pharmacists) is effective in encouraging smoking cessation. (Rice 2017; Brown 2016; Zwar 2015; Stead Buitrago 2013; Carr 2012; Litt 2003; Joyce 2007) Health professionals can encourage smokers to quit with even a minimal (less than 3 minutes) intervention: one in every 33 conversations will lead to a patient successfully quitting smoking. (Stead Buitrago 2013) For examples of how to start the conversation about quitting smoking with a patient, visit <http://starttheconversation.org.au>

More intense interventions can result in better outcomes, but may not be practical in many clinical contexts. (Fiore 2008) Brief advice has a reduced impact on smokers who have tried and failed numerous times. These people need help to quit with advice that includes strong recommendations about the use of pharmacotherapy and active referral to Quitline or other cessation programs if they are prepared to accept it. (See page 19, *The role of health professionals*).

Every smoker should be offered at least a brief intervention for smoking cessation, which should include one or more of the following: (NICE 2008)

- simple opportunistic advice to consider quitting
- offer of pharmacotherapy and behavioural support
- brief behavioural motivational support
- self-help material

- referral to more intensive, proactive support such as Quitline (13 78 48), a smoking clinic or health professional with special expertise in smoking cessation.

See recommendation 3

Evidence

Brief smoking cessation advice from health professionals delivered opportunistically during routine consultations has a modest effect size, but substantial potential public health benefit. **Level I**

Recommendation

Offer brief cessation advice in routine consultations whenever possible (at least annually). **Strength A**

Counselling

There is clear evidence that both individual counselling (Lancaster 2017) and group counselling (Stead 2017) increase quit rates over approaches where there is minimal support.

Depending on the time available, counselling strategies could include:

- information about smoking, quitting and withdrawal
- strategies for coping with smoking triggers
- addressing barriers to quitting
- lifestyle changes
- support from family and friends
- rewards
- setting a quit date.

Practical tips to assist quitting and staying quit

Challenge	Strategy
Psychological cues for smoking such as stress and anger	Muscle relaxation and breathing techniques
Social cues for smoking such as peer pressure	Avoid smoking friends and situations early in quit attempt Rehearse how to say no to a cigarette offer
Smoking triggers such as alcohol and caffeine	Avoid or minimise alcohol consumption early in quit attempt Avoid or reduce coffee and other caffeine containing drinks
Risk of lapse in quit attempt	'Not a puff' rule
Maintaining motivation	Implement reward system from money saved Enlist social support from family and friends
Minimising weight gain	Healthy diet, avoid high fat and high sugar foods, water or low-calorie drinks as substitute for snacking, regular physical activity

Individual counselling

Individual counselling interventions typically include the following components: review of a participant's smoking history and motivation to quit, help in the identification of high-risk situations, and the generation of problem-solving strategies

to deal with such situations. Counsellors may also have provided non-specific support and encouragement. Some interventions include additional components such as written materials, video or audiotapes. (Lancaster 2017) This intensive support can involve weekly face-to-face sessions between a smoker and a counsellor trained in smoking cessation for at least 4 weeks after the quit date and is normally combined with pharmacotherapy. Smoking cessation counselling is in part based on the principles of cognitive behavioural therapy (CBT), an evidence-based treatment which also forms the basis of Quitline counselling. (Hofmann 2012; Greenhalgh 2016) CBT is a psychological intervention that aims to show people how their thinking affects their mood, to help them identify and challenge unhelpful thoughts and to learn practical self-help strategies.

Motivational interviewing

Motivational interviewing is an approach widely used to help people to quit smoking. It supports smokers by strengthening their own motivation and commitment to change their reactions to the urge to smoke. (Lindson-Hawley 2015)

This type of counselling requires more time than brief interventions. It is an evidence-based counselling technique based on a therapeutic partnership that acknowledges and explores a smoker's ambivalence about smoking behaviour. The technique allows the smokers themselves to clarify what goals are important to them and to organise their reasons in a way that supports actions. Motivational interviewing values patient autonomy and mutual respect and uses open-ended questions, affirmations, reflection and summarising. (Miller 2009; Miller 2012; Lindson-Hawley 2015)

For motivational interviewing strategies see Chapter 3. Clinical interventions for tobacco use and dependence, Table B1 of *Treating tobacco use and dependence: 2008 update*. (Fiore 2008)

Mindfulness-based interventions may have an important role in helping smokers to deal with treatment and abstinence by moderating the relationship between craving and smoking and promoting the development of coping strategies to deal with triggers to smoke. Mindfulness-based cognitive therapy and mindfulness-based relapse prevention appear to reduce negative affect, craving and cigarette use among smokers who are trying to quit. (Brewer 2011; Oikonomou 2017)

Group counselling

Group behaviour therapy involves scheduled meetings (typically 4–8) where smokers receive information, advice and encouragement and some form of behavioural intervention. (NICE 2008) Group counselling can provide the opportunity to learn behavioural techniques for smoking cessation and to provide mutual social support. (Richmond 2010)

Group therapy is better for helping people stop smoking than self-help and other less intensive interventions for quitting but there is not enough evidence to evaluate whether groups are more effective or cost-effective than intensive individual counselling. (Stead 2017)

In some states (not NSW), Quitlines keep registers of local support programs led by approved providers.

Telephone counselling and Quitlines

Telephone counselling provides advice, encouragement and support by specialist counsellors to smokers who want to quit, or who have recently quit. Counsellors can call the client usually several times over the period leading up to, and the month following, a quit attempt or the client can call the service. The Quitline telephone counselling is provided in each state and territory in Australia. A review in New Zealand of the cost effectiveness of a variety of interventions found telephone Quitlines particularly when they include the use of pharmacotherapy were the most cost effective. (Shearer 2006; West 2015)

Advantages of Quitlines

- Accessible throughout Australia 13 78 48
- Confidential
- No cost to patient
- One-stop shop for resources
- Easy intervention
- Evidence-based program.

Despite the demonstrated efficacy of Quitlines, (Stead Hartmann-Boyce 2013; Borland 2008) the rate of uptake in Australia as in the USA is low. In Australia, further research is needed to understand smoker barriers resulting in the low reach of Quitlines. (Hung 2011; Bayly 2016)

Quitline services in Australia

Quitline (13 78 48) (13 QUIT) exists in all Australian states and territories. Quitline can provide a free Quit Pack and confidential telephone counselling assistance. In some states, Quitline can also assist in linking callers into community programs. Counsellors can help callers find a course and email the link to them.

Quitline is a free telephone counselling and support service. People wanting to quit smoking can call 13 7848 (13 QUIT) Monday to Friday from 8.30 am to 8 pm, and Saturdays from 2 pm to 5 pm. In WA, the service is available Monday to Friday 7.00 am to 8 pm and Saturday 12.30 pm-3.30 pm.

- All Quitline services in Australia have agreed to national minimum standards of service delivery
- In most states and territories, smokers are offered free proactive telephone counselling. Proactive or callback counselling protocols usually allow up to two sessions pre-quit and four post-quit over the first month, with two in the first week, but vary from state to state
- Online referral to Quitline (smokers can be referred by all health professionals to the Quitline for extended support using the online referral sheet). Services provide feedback to health professionals regarding patients referred to a Quitline.
- Processes for online referral to Quitline through patient management software such as Best Practice and MedicalDirector are available in some states
- Callers have direct access to an appropriately trained Quitline counsellor, course leader or coach
- Adolescent protocols are available
- Indigenous counsellors or Indigenous liaison people are available at Quitline Australia wide.
- Self-help books.

Services for those from culturally and linguistically diverse backgrounds

- In some states, bilingual educators conduct information sessions in a number of community languages, eg Quit Victoria at www.quit.org.au
- Community language-specific Quitline telephone numbers available (see below).

Web-based material

- Quitline referral form: www.quit.org.au/referral-form/
- iCanQuit: www.iCanQuit.com.au
- Quit Coach: www.quitcoach.org.au

More resources are available on the Australian Government website at www.quitnow.gov.au

Community language Quitline telephone numbers	
Arabic	1300 7848 03
Chinese (Cantonese and Mandarin)	1300 7848 36
Greek	1300 7848 59
Italian	1300 7848 61
Korean	1300 7848 23
Spanish	1300 7848 25
Vietnamese	1300 7848 65

Recommendation 17

Evidence

Telephone callback counselling services are effective in assisting cessation for smokers who are ready to quit. **Level II**

Recommendation

Referral to such services should be considered for this group. **Strength A**

Self-help materials

Self-help interventions for smoking cessation in the form of structured programs in written (books, brochures, manuals) or electronic (CDs, online, mobile phone apps) formats provide support and advice for smokers without the help of health professionals, counsellors or group support. On their own, these materials show only marginal effect compared to no intervention but may have benefits as a supplement to other cessation approaches.(Hartmann-Boyce 2014)

There is evidence that materials tailored for individual smokers in different tobacco-dependent populations are more effective than generic materials.(Fiore 2008; Young 2008; Hartmann-Boyce 2014)

Current evidence supports a beneficial impact of mobile phone-based smoking cessation interventions on 6-month cessation outcomes. (Whittaker 2016) Studies have shown the effectiveness of text message mobile phone support programs both in the short- and long-term. (Whittaker 2016; Free 2011) Combined internet and mobile telephone programs can be effective for up to 12 months for assisting smokers to quit.(Taylor 2017; Whittaker 2016)

Mobile phone-based applications (apps) are available on the Australian Government website at www.quitnow.gov.au

Online smoking cessation interventions are low cost and have the potential to reach a large number of smokers.(Walters 2006; Lenert 2004) A major advantage of the internet over printed material is its interactivity and the ability to tailor information to individual needs, but relatively few sites make use of this possibility (for a good example of an Australian site designed to tailor information to individual needs, see the free QuitCoach at www.quitcoach.org.au). Research shows the structured planning intervention, QuitCoach, can significantly reduce relapse to smoking.(Borland 2015) Web-based programs are a promising delivery system for assisting and motivating smokers to quit but further research is needed to identify their most effective use.

Unproven approaches to smoking cessation

There are some approaches that have the potential to assist with maintaining long-term smoking cessation, but they have not yet been adequately investigated for cessation.

Health professionals should be aware of extravagant claims of success for interventions that have not been subjected to rigorous testing and for which there is no clinical evidence.

Other nicotine-related agents

Nicobrevin is a patented product containing quinine (claimed to reduce cravings), menthyl valerate (supposed sedative properties), as well as camphor and eucalyptus oil (decongestants). (Gomez-Coronado 2018) NicoBloc and Nicobrevin are occasionally recommended by some healthcare professionals. These products are available in some pharmacies, (Chiang 2006) despite a lack of any empirical evidence of effectiveness. (Stead 2006)

Aversive or rapid smoking

There is no evidence to suggest that rapid (or aversive) smoking may be effective. (Hajek 2004)

Biomedical feedback

Strategies used as a motivational tool for smoking cessation in primary care include spirometry, expired carbon monoxide levels, vascular ultrasounds and genetic susceptibility. There is little scientific evidence of an effect on quitting smoking for most biomedical tests. (Bize 2012)

Demonstration of the effects of smoking to estimate lung age has not been shown to increase quit rates, (Parkes 2008) although in patients with chronic obstructive pulmonary disease it might increase levels of motivation to quit smoking in the early stages of the disease.

Physical activity

There are two major aspects to quitting tobacco use: overcoming nicotine addiction and managing the cues for smoking. It is well known that increased physical activity has many benefits for a healthy life. Exercise has been investigated as a way of helping with symptoms of nicotine withdrawal and cravings during attempts to quit. Exercise may also help by increasing self-esteem, improving mental health and might help to manage the weight gain that often follows quitting. However, there is currently no evidence to show higher abstinence rates long term with aerobic exercise, resistance exercise, physical activity and combined aerobic and resistance exercise alone. (Ussher 2014) A slight positive effect on smoking cessation at the end of treatment has been shown where yoga plus CBT was used. (Klinsophon 2017)

Increased activity should be encouraged as part of a support program as it brings other health advantages to people who are trying to quit smoking. Exercise should be recommended for everyone quitting.

Allen Carr method

Although it has considerable popular support, there has been a lack of high-quality, empirical evidence that the Allen Carr method is effective. (Dijkstra 2014). A recent randomised controlled trial involving 300 adult smokers in Ireland showed that Allen Carr's Easyway to Stop Smoking was superior to a standard online National Smoking Cessation program (22% versus 11% at 12 months follow-up). (Keogan 2018) The Allen Carr intervention consisted of a one-off 5-hour group seminar, with a maximum 20 participants, in a routine seminar session. Participants smoke during smoking breaks until there is a ritualistic final cigarette followed by a 20-minute relaxation exercise. The mechanism of the effect found is not clear and further research is needed.

St John's wort

The antidepressant St John's wort (*Hypericum perforatum*) herb extract has not been shown to aid in smoking cessation. There is as yet no convincing evidence that St John's wort, alone or with individual motivational and behavioural support, is likely to be effective as an aid in smoking cessation. (Sood 2010; Hughes 2014; Gómez-Coronado 2018)

Ineffective approaches to smoking cessation

There are several quitting methods, which are in widespread use, but have not yet been shown in well-designed trials to be effective for quitting other than as a placebo effect – or more than the effect of any counselling and support provided at the same time.

Hypnotherapy (without counselling)

Hypnotherapy is widely promoted as an effective way to stop smoking. It is said to assist smoking cessation by weakening the desire to smoke or strengthening the will to stop. Despite being in use for some decades, there are only a few well-designed studies to evaluate its use. A Cochrane meta-analysis was unable to show that hypnotherapy was superior to no treatment and there are insufficient data to compare hypnotherapy with alternate effective treatments. (Barnes 2010)

Acupuncture

People sometimes have acupuncture for quitting smoking with the aim of reducing withdrawal symptoms. Related therapies include acupressure, laser therapy and electrical stimulation. At present, there is no consistent evidence that acupuncture, or any related therapy, is better than doing nothing. Well-designed trials of acupuncture, acupressure and laser stimulation are needed before these treatments can be recommended as effective in smoking cessation. (White 2014)

Naltrexone

Naltrexone is a long-acting opioid antagonist used in the treatment of alcohol dependence. A meta-analysis of both published and unpublished studies indicate no beneficial effect of naltrexone alone or as an adjunct to NRT on short- or long-term smoking abstinence. (David 2013; David 2014) Naltrexone may have a role in reducing post cessation weight gain. (Rees 2017)

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5. Smoking cessation for high prevalence groups

Although the proportion of people aged 14 years of age and over smoking tobacco daily has continued to decline from 16.6% in 2007 to 12.2% in 2016, (AIHW NDSHS 2017) the smoking rate is lower in more affluent, better educated segments of the community, while the number of smokers in disadvantaged groups remains disproportionately high. The proportion of Australians who smoke is inversely related to the socioeconomic status of where they live – in 2016, 17.7% of people in areas with the lowest socioeconomic status smoked daily compared with 6.5% in areas with the highest socioeconomic status. (AIHW NDSHS 2017)

In many countries, including Australia, social inequalities in tobacco use contribute to inequalities in health. (NICE 2006) There is a clear relationship between smoking and socioeconomic status, with disadvantaged groups in the population being more likely to start smoking and to remain long-term smokers. In particular, the likelihood of being a daily smoker is: three times as high in the lowest compared to the highest socioeconomic areas of Australia; twice as high in remote areas compared to major cities; 2.6 times as high for Aboriginal and Torres Strait Islander (hereafter Indigenous) people compared to non-Indigenous Australians and 5.7 times as high for prison entrants compared to the general population. (AIHW AH 2016) Smokers tend to report other lifestyle risk factors such as higher levels of alcohol consumption, lower daily fruit and vegetable intake and lower levels of exercise. There is extensive evidence that tobacco use contributes to poverty and inequality; encouraging smokers to quit has the potential to improve health and also to alleviate poverty. (AIHW AH 2016)

The same guidelines for quitting smoking apply to all groups

Every opportunity should be taken to offer all smokers advice and support to stop smoking. (Fiore 2008) Counselling and behavioural interventions may be modified to be appropriate for the individual smoker. Quitlines and other service providers have been trained for clients from many high-risk groups, including Indigenous people. All nicotine-dependent smokers should be offered pharmacotherapy, unless contraindicated.

Aboriginal and Torres Strait Islander people

The current situation

- Indigenous people are 2.6 times more likely to be daily smokers than non-Indigenous Australians. (AIHW AH 2016)
- Indigenous women are three times more likely to smoke in pregnancy than non-Indigenous women (44% compared to 12%). (AIHW Mothers and babies 2017)

- The proportion of Indigenous adults who smoke has declined significantly between 2002 (49%), 2008 (45%) and 2014-15 (39%), (ABS 2016) however the gap between the Indigenous and non-Indigenous smoking rates has not decreased.
- Smoking is a major contributor to the large life expectancy gap of around 10 years (10.6 years for men and 9.5 years for women) between Indigenous and non-Indigenous Australians. (ABS 2013)
- Tobacco smoking was responsible for 23% of the health gap between Indigenous and non-Indigenous Australians. (AIHW ABDS 2016)
- In 2011, smoking was the biggest contributor (12%) to the burden of disease and injury among Indigenous Australians.

Indigenous people are highly represented in many categories of those with special needs: pregnant women, adolescents, prisoners, people with substance use problems and people with smoking-related diseases such as diabetes.

Specific barriers to smoking cessation treatment for Indigenous people, such as the social context that normalises smoking, are being addressed by health workers in many Indigenous communities. There is also evidence that this population uses medicines at a lower rate than other Australians, despite initiatives in place to improve access to treatment. Other factors – such as a high level of stress in Indigenous communities, lack of availability and access to culturally appropriate health services, language barriers and high rates of smoking among Aboriginal Health Workers – are significant barriers to the success of smoking cessation strategies for Indigenous communities. (Mark 2005; Dawson 2012; AHMRC ATRAC 2014)

Though various smoking cessation methods have been shown to be effective across different racial and ethnic groups in other countries, there has been a lack of research and evaluation of tobacco interventions in the Indigenous Australian population. (AHMRC ATRAC 2014; Carson 2012) Smoking cessation methods identified as being effective, such as brief advice and pharmacotherapy, should be provided for all smokers, unless contraindicated, as they are likely to be effective, especially if delivered in culturally sensitive ways.

Effective smoking cessation methods should be modified or tailored to meet the needs of Indigenous people in consultation with the community. This approach can involve working in collaboration with Aboriginal Health Workers. Appropriate cessation services for Indigenous people can be found at the Centre for Excellence in Indigenous Tobacco Control at www.ceitc.org.au/quitting_resources and Tackling Indigenous Smoking at <https://tacklingsmoking.org.au/>

People who identify as Aboriginal or Torres Strait Islander qualify for the Pharmaceutical Benefits Scheme (PBS) Authority listing for nicotine replacement therapy (NRT), which provides up to two courses per year of nicotine patches, each of a maximum of 12 weeks. Under this listing, participation in a support and counselling program is recommended but not mandatory.

Closing the Gap PBS co-payment measure

The Closing the Gap (CTG) measure is part of the Australian Government's Indigenous Chronic Disease Package, established to improve access to medicines by reducing the cost of accessing PBS medicines for eligible Indigenous people who are living with or are at risk of chronic disease.

Under this measure, eligible patients must be registered at a rural or urban Indigenous health service, or a general practice that participates in the Indigenous Health Incentive (IHI) under the Practice Incentives Program (PIP) in order to receive a CTG-annotated PBS prescription.

Depending on the Indigenous patient's concessional status, when a CTG- annotated prescription is dispensed at a pharmacy, the patient pays a lower, or nil, co-payment for all PBS medicines. A concessional patient's co-payment reduces to nil and a general patient's co-payment reduces to that of a concessional patient. Some suppliers of PBS medicines impose a brand premium on some brands of medicine, which the patient must pay. Brands that carry a manufacturer's surcharge are indicated by a 'B' on the PBS Schedule.

For further information email PBS-Indigenous@health.gov.au or visit www.medicareaustralia.gov.au/provider/pbs/prescriber/closing-the-gap.jsp

Culturally and linguistically diverse groups

The current situation

- Prevalence of tobacco use in culturally and linguistically diverse groups in Australia varies from one community to another. In general, people born out of Australia are less likely to be smokers than those born in Australia. (Greenhalgh 2016)
- Smoking is more common in men from Vietnamese and Chinese backgrounds (Jiang 2017) and men and women from Middle Eastern backgrounds.
- People born in Oceania (New Zealand, Melanesia, Micronesia and Polynesia), Southern and Eastern Europe, and North West Europe were the most likely to report high rates of current smoking (24%, 23% and 22% respectively), but these rates tend to be lower than those in the general population.

- Tobacco is more commonly used via waterpipes in the Middle Eastern and African communities and by chewing rather than smoking cigarettes in the Burmese community.

Some smokers in culturally and linguistically diverse groups in Australia face extra barriers to quitting, including a lack of awareness of the health consequences of smoking and secondhand smoke, lack of tobacco control regulations and norms in their culture of origin and difficulties accessing health information because of low literacy in English. (Greenhalgh 2016) These problems are most common among recently arrived groups and refugees.

Health professionals should offer advice, support and pharmacotherapy for all smokers, unless contraindicated. Support for cessation for these groups should use culturally appropriate resource materials. (Liu 2013; Nierkens 2013)

The telephone Quitline service provides printed resources in 13 languages other than English, and callers can ask to have their call returned with an interpreter, in a range of languages other than English. Bilingual educators from Quit Victoria conduct information sessions in a number of community languages (www.quit.org.au) and the NSW Multicultural Health Communication Service provides information and services to help health professionals communicate with non-English speaking communities (www.mhcs.health.nsw.gov.au).

Community language Quitline telephone numbers

Arabic	1300 7848 03
Chinese (Cantonese and Mandarin)	1300 7848 36
Greek	1300 7848 59
Italian	1300 7848 61
Korean	1300 7848 23
Spanish	1300 7848 25
Vietnamese	1300 7848 65

Smoking cessation in populations with special needs

There are several population groups for whom there are particular implications regarding nicotine dependence and the effects of smoking, as well as the use of medicines for smoking cessation. Many of these groups (children and adolescents, pregnant and lactating women, people with mental illnesses, people with substance use disorders and people with smoking-related diseases) have not been extensively studied in clinical trials of pharmacotherapy for smoking cessation.

The same guidelines for quitting smoking apply to all groups – every opportunity should be taken to offer all smokers advice and support to stop smoking. Counselling and behavioural interventions may be modified to be appropriate for the individual smoker. In addition, all nicotine-dependent smokers should be offered pharmacotherapy and referred for intensive treatment to the telephone Quitline (13 78 48), other cessation programs or local face-to-face services where available.

Pregnant and breastfeeding women

Key points

- All woman of childbearing age should be encouraged to stop smoking.
- There is no safe level of smoking in pregnancy.
- Smoking during pregnancy has adverse effects in three areas: the fetus, the pregnancy and the mother.
- The rate of smoking during pregnancy in Australia continues to fall; however, approximately 10% of women continue smoke during pregnancy. (AIHW Mothers and babies 2017)
- Younger mothers under 20 years, disadvantaged women and women with mental illness remain significantly less likely to quit smoking during pregnancy. (Passmore 2015)
- A systematic review of smoking cessation interventions during pregnancy concluded that only 13% are abstinent at term and, of these, 43% re-start by 6 months postpartum. (Jones 2016)

The only safe level of smoking in pregnancy is not smoking at all because:

- any level of tobacco smoke exposure increases the risk of adverse effects (Fiore 2008; Aliyu 2010; England 2017; Hackshaw 2018)
- the greatest gain in health benefits comes from quitting rather than cutting down.(WHO 2009; US Department of Health and Human Services 2010; Committee on Environmental Health 2009)

All woman of childbearing age should be encouraged to stop smoking ideally before conception. Smoking cessation policy is intended to minimise the effects of smoking for all women – long-term reduction tobacco exposure during pregnancy can be achieved only by encouraging adolescent girls and young women not to start smoking. (US Department of Health and Human Services 2010) It is also important to advise partners of pregnant women not to smoke around them and to encourage them to quit, as this can improve quit rates for pregnant smokers.

As well as the serious long-term health consequences for the mother, tobacco smoking during pregnancy is the most common preventable risk factor for pregnancy complications, and is associated with poorer perinatal outcomes, including low birthweight, being small for gestational age, pre-term birth, perinatal death, placental

abruption, sudden infant death, cleft palate, cleft lip and childhood cancers. (Fiore 2008; Holbrook 2016; Australian Gov CPG 2018) Long-term health effects on child health of parental smoking during pregnancy include neurodevelopmental and behavioural problems, obesity, hypertension, type 2 diabetes, impaired lung function, asthma and wheezing.(England 2017; Banderali 2015)

Women who have tried to quit smoking during pregnancy are an important group to identify and support as they are more likely to be motivated to try another quit attempt. Health professionals should understand and address the barriers to smoking cessation for pregnant women, such as: (Bauld 2017)

- a lack of understanding of risk to themselves and their babies
- the influence of close relationships on smoking status
- the use of smoking as a way of coping with stress
- the difficulty of managing nicotine withdrawal
- the high rate of mental illness.

There is the potential for pregnant women to feel unsupported or even stigmatised if advice and support provided do not recognise the emotional and psychological stressors associated with pregnancy and do not seek to address the altered physiological processes that occur during pregnancy. (Ebert 2007) Concern about stigma may lead to some pregnant women being reluctant to disclose their smoking status.

First-line treatment

Quitting before conception or in the first trimester results in similar rates of adverse pregnancy outcomes as non-smokers,(Bickerstaff 2012) and quitting at any time during pregnancy produces health benefits. Therefore, health professionals should offer cessation interventions to pregnant smokers as soon as possible in the pregnancy, throughout the pregnancy, and beyond.

Health professionals should inform pregnant women and new mothers of the dangers of secondhand (passive) smoke to newborn babies and young children. (England 2017)

Psychosocial smoking cessation interventions such as counselling, feedback and financial incentives can increase the proportion of women who stop smoking in late pregnancy, the proportion of infants born with low birthweight and reduce smoking cessation after birth. (Chamberlain 2017) Although assessing smoking status and providing advice about the harms of continued tobacco use are recommended in routine antenatal care, there is at present no framework for providing financial incentives based on biochemical measures of abstinence. Given the convincing evidence of the effectiveness of financial incentives as a motivational and engagement strategy for tobacco cessation during pregnancy, it will likely play an

important role in future public health strategies to support pregnant women to quit. (Pryor 2018)

Pregnant women should be encouraged to use Quitline, which in some states has special programs of support which extend into the postpartum period when risk of relapse is high.

Quitline provides an extended callback service specifically for pregnant callers. A Quitline advisor calls at agreed times and provides information, offers help to deal with problems, and gives encouragement and practical support with quitting. The advisor schedules calls during pregnancy and after the birth. Quitline callers may receive between four and 10 calls as part of the extended callback service.

Quitline in some states also provides online training to midwives to help pregnant mothers to quit smoking.

Health professionals should encourage pregnant smokers to attempt cessation using counselling, advice and support interventions before using pharmacological approaches as the efficacy and safety of these approaches during pregnancy are not well documented. (Siu 2015)

Second-line treatment

If quit attempts are unsuccessful without the use of medications, and the woman is motivated to quit, pharmacotherapy (usually oral forms of NRT) should be considered. (USDHSS 2010)

Oral forms of NRT and nicotine patches are approved by the TGA for use in pregnancy. However, given the limited evidence of effectiveness of NRT in pregnancy (Coleman 2015) and the potential for harm due to intrauterine nicotine exposure, NRT should only be considered if and when:

- the woman has not been able to stop with non-pharmacological assistance
- the uncertainty about the benefits and risks has been explained to the woman.

See the pharmacotherapy section on page 50 for further information.

Neither of the two prescription smoking cessation medicines, varenicline and bupropion, have been shown to be effective or safe for smoking cessation treatment in pregnant and breastfeeding smokers. If a woman becomes pregnant while taking either agent, treatment should be ceased, and, if she agrees, reporting her pregnancy outcome to health authorities and the manufacturer may over time help better understand any risk.

While nicotine passes from mother to child in breast milk, it is unlikely to be harmful. (Benowitz 2004; Ilett 2003) Women who continue to smoke after the birth should be encouraged to breastfeed their babies and provided with strategies to minimise the potential harm to their child through breast milk and from secondhand smoke. (Baraona 2017)

Recommended smoking cessation treatment: pregnant women

- Any level of tobacco smoke exposure increases the risk of adverse outcomes for the mother, the fetus and the pregnancy.
- Pregnant women should be encouraged to stop smoking completely.
- They should be offered intensive behavioural support and proactive face-to-face or telephone counselling.
- Self-help material can supplement advice and support.
- If these interventions are not successful, NRT may be considered in pregnancy, after clear explanation to the woman of the risks involved.
- Those who do quit should be supported to stay smoke-free long term.

Adolescents and young people

The current situation

- More than 80% of smokers become addicted to nicotine as teenagers.
- Adolescence is the primary time when cigarette smoking is initiated and transition from experimentation to dependence occurs - one-third of people who have ever tried smoking go on to become daily smokers. (USDHHS 2010)
- In Australia in 2016, people who smoked their first full cigarette by the age of 13 were 1.6 times as likely to smoke daily as someone who tried it in their adult years.
- One-third of teenagers who become regular smokers will eventually die prematurely from smoking-related diseases. (Mendelsohn 2010)

Accumulating evidence that suggests nicotine adversely affects adolescent development provides a strong incentive to protect children and adolescents from nicotine exposure. (England 2017) Nicotine exposure during adolescence is associated with deficits in working memory, attention and auditory processing, as well as increased impulsivity and anxiety. It is also suggested that nicotine has a priming effect that increases addiction liability for other drugs. The popularity of alternative tobacco products and e-cigarettes is creating new health challenges in this age group.

The reasons young people commence smoking are varied and relate to genetic factors, peer influence, parental smoking, weight control and stress. (Mendelsohn

2010) Recruitment and retention of adolescents in formal smoking cessation programs are difficult and are major determinants of interventions targeting young people. Computer and internet cessation programs are potential vehicles for programs aimed at young people, but as yet there is no clear evidence of efficacy. (Taylor 2017)

There is increasing evidence that younger age of starting to smoke is associated with lower success rates of stopping, regardless of treatment. (West 2018) Many adolescent anti-tobacco programs focus on preventing teenagers from starting to smoke, rather than quitting. (Towns 2017) There is insufficient evidence to show that smoking cessation programs to help teenagers who already smoke are effective. (Fanshawe 2017) There are also few studies that provide evidence of effectiveness of pharmacological interventions for adolescent smokers. Reducing parental smoking rates is the intervention with the clearest effect on youth smoking uptake (Moyer 2013).

Some quitting medications can be used by younger smokers. NRT is approved for use from the age of 12 years and can be offered if the adolescent smoker is nicotine dependent and ready to quit. Although NRT has been shown to be safe in adolescents, there is little evidence that these medications and bupropion or varenicline are effective in promoting long-term quitting in adolescent smokers. The majority of studies included an intensive counselling component (six or more sessions). Adherence is likely to be a major factor in this age group. (Fiore 2008)

Good listening skills are important in creating a trusting relationship to deal successfully with adolescents (see motivational interviewing on page 28):

- Ask open-ended questions
- Be non-judgmental, and affirm their experiences.
- Summarise what you have heard to help them understand what they want.

Advice for health professionals helping young people quit smoking

- Provide information about nicotine addiction and the difficulty of quitting once symptoms of addiction to nicotine appear.
- Provide information about the harms of smoking.
- Reinforce messages that smoking is not cool.
- Discuss the immediate effects of smoking. The long-term health effects of smoking such as cancer and heart disease are less relevant to young people. Focus instead on the immediate physical issues such as:
 - bad breath, smelly hair, yellow teeth, discoloured skin
 - increased wrinkles
 - reduced fitness
 - shortness of breath, wheezing
 - higher stress levels
 - reduced sense of taste and smell

- more coughs and colds
- being unattractive to non-smoking peers
- the expense. Calculate the cost of smoking.
- Discuss weight control, particularly for young women. Smoking does help control weight, but it also causes many unhealthy effects which outweigh any perceived benefits, as opposed to weight management with exercise and healthy eating.
- Identify triggers and discuss coping skills.
- Refer the young smoker to Quitline.

Recommended smoking cessation treatment: young people

- Reducing parental smoking rates is the intervention with the clearest effect on youth smoking uptake.
- Counselling is considered to be vital in this age group.
- Health professionals should ask adolescents about smoking and provide a strong anti-smoking message.
- NRT can be offered if the adolescent smoker, in conjunction with behavioural support, is nicotine dependent and willing to make a quit attempt
- Bupropion and varenicline are not approved for use by smokers under 18 years of age.

People with mental illness

The current situation

- Population surveys suggest a smoking prevalence of approximately 38% for those with anxiety disorder, 45% for those with affective disorders and 64% for those with substance use disorders. (Lawrence 2009)
- In 2016 Australian adults who reported having been diagnosed or treated for mental illness in the past year were more than twice as likely to be a regular smoker than the rest of the population (25.9% vs 12.3%). (AIHW NDSHS 2017)
- For people with schizophrenia, the rate is up to 66%. (Cooper 2012)

Smoking in people with mental health problems is common. Mental illness is associated with both higher rates of smoking and heavier smoking. (Lawrence 2009) People with mental illness such as schizophrenia, depression, bipolar disorder and anxiety often experience physical, financial and social disadvantages because of their illness. (Strasser 2002; Tsoi 2013) There are links between smoking and mental health, smoking and mental health and physical illness, and smoking, mental health, debt and poverty. (ASH Scotland 2015)

Actively encouraging and assisting smoking reduction and cessation are important to improve the quality of life of all smokers. (Baker 2018) Treating tobacco dependence is an important intervention for people with severe mental illness. However, cessation rates are generally lower in this group for any given level of assistance. (West 2018) A mix of face-to-face help augmented by Quitline calls is as effective as intensive face-to-face help. (Baker 2018) In people with stable psychiatric conditions smoking cessation should not worsen mental health. (Khanna 2016; Banham 2010) In fact, smoking cessation is associated with reduced depression, anxiety and stress together with improved mood compared with continuing to smoke. This finding is true in those with and without a diagnosed psychiatric disorder. (Taylor 2014)

Health professionals should offer people with a mental illness smoking cessation interventions that have been shown to be effective in the general population. Mental illness is not a contraindication to stopping smoking but the illness and its treatment needs to be monitored carefully during smoking cessation (Weiner 2011; Baker 2010; Baker 2018) as neuropsychiatric symptoms are more common during quit attempts in this population compared to smokers without a history of mental illness. (Anthenelli 2016) Higher levels of dependence in people with mental illness may need more intensive treatment, such as higher doses of NRT and closer follow-up and monitoring. Varenicline has been found to be safe and effective in smokers with stable mental illness or a past history of mental illness. (Anthenelli 2013)

Smoking and drug interactions in people with a mental illness

While nicotine does not interact with psychiatric medications the tar in tobacco smoke induces certain liver enzyme activity (CYP450 1A2) which increases the metabolism of certain medications including some psychotropic drugs. Smokers may therefore require larger doses of these medications. (Lucas 2013; NSW Gov 2012) In the event of smoking reduction or cessation the dose of drugs metabolised by the CYP1A2 system may require dose reduction and increased monitoring. (UK Medicines Information 2017)

Recommended smoking cessation treatment: people with mental illness

- Intensive smoking cessation counselling and close follow-up are important in this group.
- Consultation with a psychiatrist or addiction specialist may be considered for advice on use of medicines for smoking cessation in people with significant mental illness. This can include advice on use of smoking cessation medicines and the need for adjustment of psychotropic medications as well as monitoring of neuropsychiatric symptoms.
- NRT is safe and effective for people with a mental illness. Combination NRT is generally needed as people with mental illness have higher levels of nicotine dependence.

- Both varenicline and bupropion can be used in people with significant mental illness. A large randomised trial has shown no increase in neuropsychiatric adverse events attributable to varenicline or bupropion relative to nicotine patch or placebo. (Anthenelli 2016)

People with other substance use disorders

The current situation

- Smoking rates in people with alcohol and other drug dependencies are two to four times those of the general population.

Cannabis and tobacco are often used together as a way of smoking cannabis. As rates of cigarette smoking decline, it is now more common for cannabis dependence to lead to tobacco dependence than was previously the case. (Patton 2005) Smoking cessation has not been a major part of clinical interventions for these people as the attention is usually focused on the alcohol or illicit drug use. There is good evidence that smoking cessation can enhance short-term abstinence, rather than compromise the outcome of drug and alcohol treatments, (Apollonio 2016; Prochaska 2004) and that smoking cessation efforts may actually support long-term drug and alcohol abstinence. (ASH Scotland 2015)

People with alcohol dependence typically have lower success rates in smoking cessation compared to the general population. (Friend 2005; Greenhalgh 2016) Continued smoking has been shown to adversely affect treatment for cannabis dependence. Success in smoking cessation for people with opiate dependence is lower than the general population. However, the conclusion from a Cochrane review suggests that providing tobacco cessation interventions targeted to smokers in treatment and recovery for alcohol and other drug dependencies increases tobacco abstinence. (Apollonio 2016)

Monitoring and support are needed for smoking cessation in people with substance use problems who may benefit from the involvement of other health professionals, such as a drug and alcohol counsellor, an addiction psychiatrist or psychiatrist with an interest in substance use disorders and intensive counselling from Quitline.

Recommended smoking cessation treatment: people with substance use disorders

- Health professionals should offer encouragement, motivation, advice and counselling to these people.
- NRT is effective for quit attempts.
- Bupropion should be monitored carefully when used concurrently with alcohol use.

- Varenicline can be used. Prescribers should ask patients to report any mood or behaviour changes.(Fiore 2008)

People in prison

The current situation

- The prevalence of smoking in the prison population is 5.7 times higher than in the general population at 74%
- Most Australian prisons (except in WA) are smoke free
- NRT may be provided on entry in some smoke-free prisons.

Although smoking rates have fallen dramatically in recent decades in the general Australian population, they have remained high among prison entrants. (AIHW AH 2016) There is a clear association between smoking tobacco and social disadvantage and people from low socioeconomic groups such as Indigenous people, drug users, the less educated and those suffering mental illness are over-represented in the prison system. Each of these factors predicts higher smoking rates.(Greenhalg 2016; AIHW prisons 2015)

A number of jurisdictions have implemented free or subsidised smoking cessation pharmacotherapy. In New Zealand, smoke-free prisons have been successfully implemented, including freely available NRT for prisoners and staff who smoke. Since 2016, a complete smoking ban has been introduced in all Australian territories and states (except Western Australia) in prisons. Cessation support may be available for prisoners, including access to free or subsidised NRT in some prisons. In some Australian states, smoking cessation groups and telephone support from Quitline have been provided in some prisons.

Motivation to quit smoking is high in the prison population. One-half (50%) of all prison entrants who were current smokers reported that they would like to quit smoking. (AIHW prisons 2015) Of dischargees from prisons across Australia with smoking bans, only 59% intended to smoke after release. (AIHW AH 2016) Despite these data, trends among Australian prisoners are comparable with the growing body of literature which suggests that smoking bans have no gross impact on post-release cessation. A Queensland study found 72% of dischargees had relapsed within the first day of release and 94% had returned to smoking within two months. (Puljevic 2018)

Smoking cessation programs conducted in prisons should address prison-specific difficulties by including items such as a stressor pack to assist prisoners during transfer to other prisons and court appearances. (Richmond 2006) Support programs should also discuss how to prevent relapse on release from prison.

Recommended smoking cessation treatment: people in prison

- Health professionals should take every opportunity to offer advice to quit.
- Health professionals should advise proactive telephone counselling (Quitline 13 78 48).
- Health professionals should closely follow-up smokers attempting to quit or maintain cessation post release.

People with smoking-related diseases

The current situation

- Tobacco smoking increases the risk of cardiovascular disease, respiratory diseases and other health problems (USDHSS 2014).
- In Australia, 80% of lung cancer burden and 75% of chronic obstructive pulmonary disease burden are attributable to tobacco smoking. (AIHW AH 2016)

Offering smoking cessation support should be central to the clinical encounter with smokers with cardiovascular, respiratory and other health co-morbidities. Smokers need to quit completely rather than cut down if they wish to avoid most of the risk associated with heart disease and stroke. (Hackshaw 2018). There is clear evidence that people with a smoking-related disease or with other risk factors for cardiovascular disease (such as diabetes, lipid disorders and hypertension) who continue to smoke greatly increase their risk of further illness. It is important to target these smokers for quit interventions, given the role that smoking plays in exacerbating their conditions. (Fiore 2008; Benowitz 2018) For example, second heart attacks are more common among cardiac patients if they continue to smoke, and people with successfully treated cancers who continue to smoke are at increased risk of a second cancer. (Critchley 2004) Quitting smoking after a heart attack or cardiac surgery can decrease a person's risk of death by at least one third. (Stockley 2009)

People with cardiovascular disease are highly motivated to quit smoking and success rates can be high, especially where patients understand the link between their health problem and their smoking. It is recommended that smoking cessation is integrated into the routine chronic disease management programs for these smokers. High-intensity behavioural interventions, coupled with appropriate pharmacotherapy, are effective in this group. (Rigotti 2012; Rigotti 2010; Ockene 2010)

Smoking has an ongoing impact on patients with chronic airways disease, such as chronic obstructive pulmonary disease (COPD) and asthma. Smoking cessation is the most important treatment for smokers with COPD, as there is a clear relationship between continued smoking and progression of COPD. Smoking in those with COPD is associated with a faster decline in lung function and an increase in symptoms – as

well as an increased risk for respiratory tract infection and hospitalisation.(Stockley 2009; Gritz 2007) There is strong evidence that a combination of behavioural treatment and pharmacotherapy is effective in helping smokers with COPD to quit smoking. (van Eerd 2016) In people with asthma, smoking further impairs lung function, increases symptoms and impairs the effectiveness of treatment.(Chaudhuri 2003; Tomlinson 2005; Lucas 2013) First-line management of all smokers with asthma should always be strong encouragement to quit. Providing personalised quitting strategies and inpatient NRT and counselling have been shown to be effective for smokers who are hospitalised for asthma. (Perret 2016)

Many studies have found a significant association between cigarette smoking and the development of diabetes, impaired glycaemic control and diabetic complications, in both men and women. Smoking cessation is a crucial aspect of diabetes care for adequate glycaemic control and limiting development of complications. (USDHSS 2010) People with diabetes who smoke increase their risk of cardiovascular disease, peripheral vascular disease, progression of neuropathy and nephropathy. Smokers with type 2 diabetes need a larger insulin dose to achieve metabolic control similar to that in patients who do not smoke.(Targher 1997)

Recommended smoking cessation treatment: people with smoking-related diseases

- Health professionals should advise smokers that there is no safe level of smoking for smoking-related diseases such as cardiovascular disease, COPD and asthma.
- Use the medical condition as an opportunity to integrate quitting into a management program for other diseases.
- Encourage the use of a combination of behavioural treatment and pharmacotherapy after assessment of nicotine dependence and clinical suitability.

Hospitalised smokers

People who smoke are at increased risk for conditions requiring hospitalisation. Smoking also complicates outcomes for patients undergoing procedures in hospital. In addition, the period of hospitalisation can provide opportunities to encourage smokers to quit. All patients who smoke should have nicotine withdrawal symptoms managed while in hospital and should be supported with advice and interventions which may lead to smoking cessation after leaving hospital. (Thompsen 2014; Rigotti 2012)

All smokers admitted to hospital should be advised that complete cessation is the best approach for optimum outcomes. The smoking status of all patients being admitted to hospital should be noted in their medical record. Smoking cessation care and advice and the management of withdrawal symptoms should be offered during

the hospital stay. Regular medications that interact with smoking should be reviewed and doses adjusted for patients admitted to hospital.

There is convincing evidence that smokers who undergo surgery have higher risks of cardiac and respiratory complications and increased wound infection rates. (Peters 2004) In order to reduce surgery complications and improve postoperative outcomes, smokers who are planning surgical procedures should be encouraged and supported to quit smoking at least 4 to 6 weeks before their admission date. (NSW Health 2015; Thomsen 2014)

Support to manage nicotine dependence for hospitalised smokers includes the use of NRT (including oral forms and patch) in adequate strength to control nicotine withdrawal symptoms throughout the day. An oral form of NRT is often required in addition to the patch to manage cravings and other withdrawal symptoms. Patients should be assessed for contraindications and precautions and monitored while in hospital for side-effects and drug interactions. (NSW Health 2015) Longer-term smoking cessation rates are achieved when counselling and NRT that begin during hospitalisation are continued after hospital discharge for at least one month. (Rigotti 2012)

Recommended smoking cessation treatment: hospitalised smokers

- Ask patients about their tobacco status and note it in their medical record.
- Offer assistance to every smoker admitted to hospital to begin treatment to quit or to manage cravings and other nicotine withdrawal symptoms.
- For best outcomes, manage a patient's nicotine dependence while in hospital and encourage the patient to remain smoke-free after leaving hospital.
- For smokers planning surgery, advise quitting 4 to 6 weeks before the surgery date.
- Monitor patients on NRT to assess response, provide support and modify treatment as needed.
- Recommend a referral to Quitline 13 78 48.

Secondhand smoke

Secondhand smoke, or environmental tobacco smoke or passive smoke, can affect the health of people who do not smoke. There is clear evidence of the harms of exposure to environmental tobacco smoke in pregnancy, to children (higher rates of respiratory and middle ear infections, meningococcal infections and asthma) and adults (increased risk of lung cancer, coronary heart disease and stroke).(USDHHS 2014; England 2017) The evidence for the health effects of secondhand smoking has been summarised by a number of health authorities including the Australian

Government National Health and Medical Research Council. (Frazer 2016; NZ Ministry of Health 2014; Benowitz 2008; NHMRC 1997)

Any exposure to tobacco smoke – even an occasional cigarette or exposure to secondhand smoke – is harmful, (USDHHS 2010) especially to children.(Best 2009)

There is a lack of evidence on the effectiveness of advising non-smokers to limit exposure to tobacco smoke. There is evidence that providing information to parents on the harms of exposing children to environmental tobacco smoke can reduce their exposure. (Fiore 2008) Due to the evidence of harms from exposure, non-smokers, especially parents of babies and young children and pregnant women, should be strongly advised to limit exposure to tobacco smoke. Smoking parents should be encouraged not to smoke in the house or in a confined space such as a motor vehicle at any time.

Thirdhand smoke

Thirdhand smoke refers to residual tobacco smoke constituents that remain on surfaces and in dust after tobacco has been smoked. These substances are then re-emitted as gases or react with other compounds in the environment to create new toxicants and carcinogens. (Campbell 2017) The main constituents of thirdhand smoke are nicotine, 3-ethenylpyridine, phenol, cresols, naphthalene, formaldehyde and tobacco-specific nitrosamines.(Northrop 2016)

Thirdhand smoke exposure can take place over a longer time than secondhand smoke exposure, and thirdhand smoke components are difficult to remove from carpets, furniture and surfaces compared with secondhand smoke that is removed by ventilation. Further research is needed to understand and respond to the potential harms posed by thirdhand smoke.

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6. Tobacco harm reduction

The goal for smokers should always be to stop smoking altogether to reduce or eliminate the harms from smoking. However some people are unable or unwilling to give up tobacco or nicotine use completely and for this group a tobacco harm reduction approach has been suggested. Possible approaches to reduce the exposure to toxins from smoking include reducing the amount of tobacco used, and using less toxic products, such as pharmaceutical, nicotine and potential reduced-exposure tobacco products (PREPs), as an alternative to cigarettes.

Currently there is limited evidence of decrease in tobacco-related diseases from reducing rather than quitting smoking. (Hackshaw 2018; Inoue-Choi 2017) Research has shown that smoking reduction by 50% modestly reduces the risk of lung cancer in people who smoke 15 or more cigarettes each day, (Godtfredsen 2005) but has not shown a decrease of risk of fatal or non-fatal myocardial infarction, hospitalisation for COPD or all-cause mortality compared with heavy smokers who do not change smoking habits. (Hackshaw 2018; Godtfredsen 2003; Godtfredsen Holst 2002; Godtfredsen Vestbo 2002)

While there is a lack of evidence of long-term health benefit from interventions to reduce rather than cease smoking there is some evidence that smokers using these strategies may progress to quitting even if they did not initially intend to do so. For

example smokers who use NRT for smoking reduction are approximately twice as likely to progress to quitting than those who do not. (Lindson-Hawley 2016).

Reducing to quit with nicotine

Smokers who are not willing to quit can be advised to partially substitute their cigarette intake with NRT. Gradually, cigarette intake can be reduced and NRT increased. Use of NRT in this way can double the odds of progressing to complete smoking cessation. (Lindson-Hawley 2016; Moore 2009) Long-term partial replacement with nicotine is not recommended as no clear health benefit has been demonstrated.

Reducing to quit without nicotine

Reducing cigarette intake without a nicotine supplement is not recommended and has little proven health benefit. Research shows that when reducing cigarette intake, smokers adjust their smoking topography (number of puffs, depth of inhalation) to maintain the desired level of nicotine.

Electronic cigarettes for harm reduction

Electronic cigarettes (e-cigarettes) are battery-powered devices that deliver nicotine in a vapour without tobacco or smoke. The device heats a liquid into an aerosol for inhalation, simulating the behavioural and sensory aspects of smoking. The liquid is usually made up of propylene glycol and glycerol, with or without nicotine and flavours, stored in disposable or refillable cartridges. The nicotine content of e-cigarettes can vary from zero to doses up to 50 mg/mL. E-cigarette users are referred to as vapers and e-cigarette use as vaping. (Hartmann-Boyce 2018)

The use of e-cigarettes is controversial as their long-term safety is unknown. (Evans 2018; Hartmann-Boyce 2016, Byrne 2018) E-cigarettes have a potential role as a harm reduction strategy for people who do not want to give up tobacco or nicotine use completely. Proponents point to the situation in Sweden where prevalence of combustible tobacco use is low (5%) perhaps in part related to the use of oral tobacco products and the experience in the United Kingdom where increasing use of e-cigarettes has been associated with a decrease in use of combustible tobacco (Public Health England). Population studies in both the UK and US suggest a higher uptake of e-cigarettes by smokers who are motivated to quit. (Zhu 2017; McNeill 2018). However many contextual factors including the strength and maturity of tobacco control policies influence the prevalence of tobacco use so comparisons between countries need to be made with caution.

Concerns about e-cigarettes include a lack of evidence for long-term safety; continued concurrent use with smoking (dual use); and the potential to promote nicotine use and renormalise smoking among non-smokers, especially young people. Data on uptake of vaping products among youth is rapidly changing and varies between countries. In the United States the National Youth Tobacco Survey

data showed a dramatic increase in current e-cigarette use in high school students 1.5% in 2011 to 20.8% in 2018 (Bhatnagar 2019). It remains to be seen whether such increases will also occur in other countries that allow access to e-cigarettes as a consumer product.

The potential role of e-cigarettes as a harm reduction strategy is particularly relevant to people with mental illness. In recognition of the disproportionately high smoking prevalence and low quit rates among people living with mental illness, the Royal Australian and New Zealand College of Psychiatrists supports the legalisation and regulation of nicotine-containing e-cigarettes and other vaporised nicotine products to facilitate their use as harm reduction tools. (RANZCP 2018) However other organisations oppose use of e-cigarettes for this purpose.

In Australia, a precautionary approach to the use of e-cigarettes has been taken. Under Australian law, nicotine is classified as a Schedule 7 poison and it is illegal to possess it without a valid prescription. No vaping products are currently approved by the TGA and sale of nicotine containing e-cigarettes is illegal.

An important consideration with e-cigarettes is the regulatory framework within which they are made available. If sold as a consumer product there is the risk of use for purposes other than cessation or reduction in use of combustible tobacco. This includes the risk of marketing to non-smokers, including to young people, either directly or via social media. For a review of Australian and international position statements on e-cigarettes, health and options for regulation, see *Tobacco in Australia: facts and issues*. (Greenhalgh 2018)

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7. Resources for health professionals

Australia

RACGP publications (including Smoking cessation guidelines for health professionals)

<https://www.racgp.org.au/your-practice/guidelines/>
www.racgp.org.au/guidelines/smokingcessation

Quit Victoria

www.quit.org.au

Australian Government National Tobacco Campaign Quit Now

www.quitnow.gov.au/internet/quitnow/publishing.nsf/Content/home

Scollo MM, Winstanley MH, editors. Tobacco in Australia: facts and issues. A comprehensive online resource. 4th ed. Melbourne: Cancer Council Victoria, 2018. Available at: www.tobaccoinaustralia.org.au

Action on Smoking and Health (Australia) is a not-for-profit organisation that aims to reduce the harmful effect of tobacco use by advocating a comprehensive tobacco control strategy at national, state and local levels.

www.ashaust.org.au

Australian Association of Smoking Cessation Professionals (AASCP) for referral to a tobacco treatment specialist

www.aascp.org.au

The Australasian Professional Society on Alcohol and other Drugs (APSAD)

<https://www.apsad.org.au/about>

SANE is an advocacy organisation to assist people with mental illness. SANE has developed a number of resources on mental illness and smoking such as the Smokefree Zone resource pack and the Smokefree Kit for health professionals

www.sane.org/mental-health-and-illness/facts-and-guides/smoking-and-mental-illness

Support programs offered by pharmaceutical companies such as:

My Time to Quit: www.mytimetoquit.com.au

United Kingdom

Treatobacco.net: evidence-based information about the treatment of tobacco dependence

www.treatobacco.net/en/index.php

UK National Centre for Smoking Cessation and Training provides online access to the Very Brief Advice Training module

www.ncsct.co.uk

United States of America

US Department of Health and Human Services. Clinical Practice Guideline: treating tobacco use and dependence. 2008 update www.ncbi.nlm.nih.gov/books/NBK63952/

Help for Smokers and Other Tobacco Users. A companion of the Clinical Practice Guideline. Treating tobacco use and dependence: 2008 update. Includes educational and motivational messages and resources to help people quit smoking

<https://www.ahrq.gov/professionals/clinicians-providers/guidelines-recommendations/tobacco/clinicians/tearsheets/helpsmokers.html>

New Zealand

The New Zealand guidelines for helping people to stop smoking

<https://www.health.govt.nz/system/files/documents/publications/nz-guidelines-helping-people-stop-smoking-jun14.pdf>

Background and recommendations to the New Zealand guidelines for helping people to stop smoking

<https://www.health.govt.nz/system/files/documents/publications/background-recommendations-new-zealand-guidelines-for-helping-stop-smoking-mar15-v2.pdf>

International initiatives - World Health Organisation

Tobacco Free Initiative (TFI)

www.who.int/tobacco/en

Appendix 1

Disclosure of Interests

Professor Nicholas Zwar has provided expert advice on smoking cessation education programs to Pfizer Pty Ltd and Glaxo Smith Kline Australia Pty Ltd and has received support to attend smoking cessation conferences. No interests to declare in last five years.

Professor Ron Borland has developed QuitCoach, onQ, QuitTxt smoking cessation programs, although he has no commercial interest in them.

Associate Professor John Litt has provided smoking cessation advice and training at meetings supported by Pfizer Pty Ltd. He is a member of the Pfizer Champix Advisory Board, a member of the Pfizer Smoking Exchange Summit planning committee, and spoke at the Exchange Smoking Cessation conference in Melbourne, October 2018.

Associate Professor Matthew Peters has received honoraria from Pfizer Pty Ltd for contribution to the varenicline advisory board and for CME lectures at meetings supported by Pfizer Pty Ltd and Glaxo Smith Kline Australia Pty Ltd in relation to asthma / COPD treatments.

Associate Professor Colin Mendelsohn has received honoraria for teaching, consulting and conference expenses from Pfizer Pty Ltd, Glaxo Smith Kline Australia Pty Ltd and Johnson & Johnson Pacific Pty Ltd. He is a Board Member of switch2vaping, a not-for-profit health education charity aiming to improve public health about smoking and tobacco harm reduction. Professor Mendelsohn is also Chairman of Australian Tobacco Harm Reduction Association (ATHRA). Whilst he contributed to discussion, he was not able to cast any votes on developing any recommendations relating to e-cigarettes.

Mr George Masri worked for the Department of Health which contributed to funding the Smoking cessation guideline update.

Dr Mathew Coleman worked as a consultant psychiatrist with Western Australia Country Health Service, and as Senior Clinical Lecturer with the Rural Clinical School of Western Australia.

Professor Robyn Richmond disclosed no conflicting interests.

Ms Kathryn Sharples disclosed no conflicting interests.

Mr Scott Walsberger disclosed no conflicting interests.