

**Health Professionals and Smoking cessation**

**European Report on the Treatment of Tobacco Dependence**

This document has been prepared by Peter Anderson on behalf of the Health Professionals and Smoking Cessation Project (HPs2) and is a result of the HPs2 project.

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## SUMMARY

### Tobacco and health

**Tobacco increases the risk of ill-health** The harm done by smoking is related both to the number of cigarettes smoked and to the number of years of smoking, with the duration of smoking having the greater impact. Smoking is a particularly important cause of cancer, cardiovascular and peripheral vascular diseases, and adverse pregnancy outcomes. Persistent smokers run a 1 in 2 risk of dying from cigarette smoking, losing, on average, 8 years of life.

**Tobacco increases the risk of ill-health to others** The risk of both lung cancer and coronary heart disease is about 25% higher in non-smokers who live with a partner who smokes. Cigarette smoke can promote acute coronary events by having an immediate effect on increasing heart muscle oxygen demand.

**Reducing tobacco use improves health** Smokers who give up smoking by their mid-thirties have a life expectancy indistinguishable from never smokers. Even those who give up smoking in their late 60s live significantly longer than continuing smokers. The risk for cardiovascular diseases falls more quickly and substantially than the risk for lung cancer after stopping smoking.

### Measures to reduce tobacco use

**Effective policy measures to reduce tobacco use** An effective tobacco policy is a comprehensive one, which: promotes public health through increases in tobacco prices, total bans on marketing of tobacco products, effective product regulation, and restrictions on availability; creates supportive environments through smoke free workplaces and counter advertisements; develops personal skills through mass media and education campaigns; and underpins community action through the creation of non-governmental organizations and coalitions. The Framework Convention on Tobacco Control is an international legally binding agreement to reduce tobacco use.

**Smoking cessation is a part of tobacco policy** Smoking cessation is an essential component of tobacco control. The Framework Convention on Tobacco Control requires its signatories to develop and disseminate appropriate, comprehensive and integrated guidelines for the treatment of tobacco dependence, and to promote cessation of tobacco use and adequate treatment for tobacco dependence.

### The effectiveness of smoking cessation interventions

**Behavioural support is effective for stopping smoking** Behavioural support is effective in helping smokers to stop smoking. Forty smokers need to be advised for one to stop. The effectiveness can be increased with longer, more frequent and more intensive support. Neither the mode of support, nor the use of additional materials or support adds much to the effectiveness.

**Pharmacological support is effective for stopping smoking** Combined with behavioural support, nicotine replacement products are effective in helping smokers who smoke more than 10 cigarettes a day to stop smoking. Fourteen smokers need

to receive a product for one to stop. It does not seem to matter which type of nicotine replacement product is used. When combined with behavioural support, both bupropion (eleven smokers to receive product for one to benefit) and nortytiline (ten smokers to receive product for one to stop) are effective in helping smokers to quit.

### **Costs and cost effectiveness of smoking cessation interventions**

**Smoking cessation support is cost effective** The treatment of tobacco dependence is one of the most cost-effective treatments provided by the health care system. Treatment provided by general practitioners can result in immediate financial savings.

### **Providing health care infrastructure**

**Required infrastructures for effective services for smoking cessation** Five domains are required for an effective service for smoking cessation: organization of health care, support for providing treatment, availability of effective treatments, provision of effective treatment by health care providers and uptake of effective treatment by health care users.

### **Supporting health care providers**

**Conditions for effective involvement of primary care providers** A combination of practice-based and educational interventions are effective in increasing health care providers rates of identifying the smoking status of their patients (by 15%), in increasing health care providers advice giving rates to smokers (13%) and the quit rates of their patients (5%).

### **Supporting health care users**

**Conditions for effective involvement of smokers** Users' knowledge of the harm and addictiveness of tobacco products and the why and how of treatment can enhance treatment effectiveness. Their treatment seeking behaviour influences treatment provision, their intentions to quit are a predictor of successful quit attempts, and their persistence with treatment can increase success rates.

## RECOMMENDATIONS

### Recommendations

- R1.** **The use of tobacco** is the leading cause of ill-health and premature death. Giving up smoking leads to an immediate improvement in health and reduces the call on the health care budget. Efforts on the part of health care providers, insurers, employers and governments should therefore focus on encouraging and assisting people in their attempts to stop smoking.
- R2.** **The Framework Convention on Tobacco Control** requires immediate and extensive implementation. The impact of treatment services will be severely diminished in a permissive environment where tobacco products are cheap, used without restriction in public and work places, and are readily promoted and marketed.
- R3.** **Every person coming into contact** with the health care sector needs to be asked about their smoking; every smoker needs to be advised to stop smoking, with the offer of pharmacological help to every smoker who smokes more than 10 cigarettes a day. Although much has been achieved through the health care sector, the availability of support for smoking cessation remains severely limited, and the full potential of the health care sector grossly underutilized. A much greater investment is required to integrate smoking cessation into routine clinical care, for which all health care providers should be accountable and competent.
- R4.** **The treatment of tobacco dependence** represents an extremely efficient use of financial resources that leads to better health and financial gains both in the short term and the long term. Financial resources within the health care sector should be devoted more specifically to the treatment of tobacco dependence.
- R5.** **An integrated strategy** needs to be provided for the treatment of tobacco dependence.
- R6.** **The costs of treatment** of tobacco dependence should be fully reimbursed to providers and users.
- R7.** **A comprehensive evaluation** and reporting system for services for the treatment of tobacco dependence should be developed and implemented.
- R8.** **Training programmes** for the treatment of tobacco dependence for health care providers working in primary health care, including general practitioners, general practice based doctors' assistants and nurses, pharmacists, dentists and midwives need development, implementation and accreditation. Training should focus on and be embedded in both vocational and specialist training as well as in continuing medical education.
- R9.** **Practice based screening**, intervention and referral protocols and aids that are needed for routine use in primary health care facilities, including general practitioners, general practice based doctors' assistants and nurses, pharmacists, dentists and midwives need development, based on clinical guidelines for the treatment of tobacco dependence, to ensure that such

care is embedded in normal clinical practice across the chain of health care provision.

- R10.** **The professional bodies** representing primary care based services should review the needs of primary care providers, and could consider assessing their clinical competence and clinical responsibilities in providing treatments for tobacco dependence.
- R11.** **Communications strategies** need to be extended and implemented to motivate smokers to stop, and to communicate a health message to smokers on the availability of effective help.
- R12.** **Monitoring services** for the treatment of tobacco dependence should include an assessment of the quality of services delivered, and an assessment of the number of extra quit attempts gained.

## 1. INTRODUCTION

**One half of all people who regularly smoke will die from cigarettes**, half in middle age and half in older age (Doll et al 1994). Tobacco use is killing approximately five million people worldwide each year (Peto et al 2003). There are benefits at all ages to stopping smoking, although the benefits become progressively greater with younger ages of quitting (Peto et al 2000). In a 30-50 year time frame, it is impossible to reduce tobacco related deaths, unless adult smokers are encouraged to quit (World Bank 1999). This can be achieved through price measures, non-price measures and through increased availability of treatment for tobacco dependence. It has been suggested that treatment can produce more immediate and probably larger short-term public health gain than any other component of a comprehensive tobacco control programme (Eriksen 2000).

**Treatment for tobacco dependence** includes (singly or in combination) behavioural and pharmacological interventions such as education, brief counselling and advice, intensive support, administration of pharmaceuticals or other interventions that contribute to reducing or overcoming tobacco dependence in individuals and in the population as a whole (World Health Organization 2000). Treatments for tobacco dependence are highly effective (Sutherland 2003; Fagerstrom 2003) and are amongst the most cost effective of all health care interventions (Cromwell et al 1997; Warner 1997; Parrott et al 1998; Parrott et al 2003; van Reenen et al 2003), leading to immediate health gain (Lightwood et al 1997; Lightwood et al 1999; Moller et al 2002; Institute of medicine 2001; Tonstad 2003). The key to increasing the cost effectiveness even further is to increase the availability of services (World Bank 1999). Clinical guidelines and recommendations have called for an increase in the availability, affordability and accessibility of high quality services for the treatment of tobacco dependence (Raw et al 1998; West et al 2000; Fiore et al 2000; Kwaliteitinstituut voor de Gezondheidszorg 2003).

**Since harmful tobacco use and tobacco dependence are recognized clinical disorders** within the WHO ICD-10 Classification of Mental and Behavioural Disorders (World Health Organization 1992), Member States of the Organization are obliged to provide treatment, particularly when it is effective and highly cost effective. The Framework Convention on Tobacco Control requires its signatories to develop and disseminate appropriate, comprehensive and integrated guidelines for the treatment of tobacco dependence, and to take effective measures to promote cessation of tobacco use and adequate treatment for tobacco dependence (World Health Organization 2003).

However, despite the obligation to provide treatments for tobacco dependence, **there is no framework for health care planners and managers** that enables the organization or allows for an assessment of what constitutes an effective service. Although clinical guidelines are a step in this direction, they are only one, although essential, aspect, of an effective tobacco dependence treatment service. An effective service can only be defined when all the aspects and partners that play a role in it are taken into account.

**This report offers a basis to help organize, assess, and ultimately improve treatment services for tobacco dependence.** The report, whose remit is treatment rather than prevention of tobacco dependence, is premised on four principles: 1) tobacco dependence is a chronic relapsing clinical disorder requiring treatment like any other recognized disorder, condition or illness (Fiore et al 2000); 2) tobacco dependence is an environmentally responsive clinical disorder, and thus any treatment service has to be embedded in effective tobacco policy that regulates the



price, marketing and availability of tobacco products (World Bank 1999); 3) treatment services for tobacco dependence should be based on evidence-based health care policy and health care management (Sackett et al 2000; Gray 2001; Evidence-based health care tool box 2003); and 4) article 14 of the framework convention on tobacco control provides a minimum standard by which all smoking cessation services should be judged (World Health Organization 2003).

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## 2. METHODS TO PREPARE THE REPORT

The report is based on systematic reviews and meta-analyses undertaken in the field of treatment for tobacco dependence, including the Cochrane Library (2003) the SRNT-WHO database on treatment for tobacco dependence (2003), and the clinical guidelines of the United States (Fiore et al 2000), England (Raw et al 1998; West et al 2000) and the Netherlands (Kwaliteitsinstituut voor de Gezondheidszorg 2003). In addition, key texts and publications were identified through reference lists and experts' suggestions. The material obtained was supplemented with hand searches of the journals *Addiction* and *Tobacco Control* for the years 2000 to 2005.

The primary aim of the report is to advise managers and financiers of primary care services and primary care providers themselves on the current knowledge about the effectiveness of various techniques for assisting smokers who want to stop smoking. The report is based on a review of the evidence, relying, where possible, on evidence from well-designed research studies. Where this evidence was not available, recommendations are based upon appropriate clinical experience. The evidence is summarized in each chapter. The intention is to provide evidence that guides rather than dictates interventions, education and professional development. The report is not intended to replace existing country based reports; rather, it aims to stimulate the development and implementation of smoking cessation help in all countries.

**Purpose of the report** The primary aim of the report is to provide up-to-date, evidence-based information for managers and financiers of primary care services and primary care providers on the why and how of helping smokers to quit smoking. This information is required because of the size and importance of the health burden created by tobacco, and the variations in practice, and often lack of practice across Europe, for helping smokers to quit smoking.

**Audience for the report** The report is intended for both primary care providers who help smokers to quit, and for the managers, educators, financiers and evaluators of primary care services who wish to know the why and how of an effective intervention to help a smoker to quit.

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### 3. TOBACCO AND HEALTH

#### Summary of chapter evidence

**Tobacco increases the risk of ill-health** The harm done by smoking is related both to the number of cigarettes smoked and to the number of years of smoking, with the duration of smoking having the greater impact. Smoking is a particularly important cause of cancer, cardiovascular and peripheral vascular diseases, and adverse pregnancy outcomes. Persistent smokers run a 1 in 2 risk of dying from cigarette smoking, losing, on average, 8 years of life.

**Tobacco increases the risk of ill-health to others** The risk of both lung cancer and coronary heart disease is about 25% higher in non-smokers who live with a partner who smokes. Cigarette smoke can promote acute coronary events by having an immediate effect on increasing heart muscle oxygen demand.

**Reducing tobacco use improves health** Smokers who give up smoking by their mid-thirties have a life expectancy indistinguishable from never smokers. Even those who gave up smoking in their late 60s lived significantly longer than continuing smokers. The risk for cardiovascular diseases falls more quickly and substantially than the risk for lung cancer after stopping smoking.

#### Recommendation

**The use of tobacco** is the leading cause of ill-health and premature death. Giving up smoking leads to an immediate improvement in health and reduces the call on the health care budget. Efforts on the part of health care providers, insurers, employers and governments should therefore focus on encouraging and assisting people in their attempts to stop smoking.

The harm done by smoking is related both to the number of cigarettes smoked and to the number of years of smoking, but of these two factors, the duration of smoking has the greater impact. For some diseases, such as lung cancer, the risk remains relatively low for the first 20 years of smoking, but then rises exponentially with increased duration of smoking (Doll et al 1994). As a result, smoking-attributable deaths from lung cancer tend to occur 20 to 30 years after changes in population smoking prevalence. Persistent smokers run a 1 in 2 risk of dying from cigarette smoking, losing, on average, 8 years of life (Doll et al 1994).

About 20% of all cancer deaths worldwide are caused by smoking (World Health Organization 2002). Smoking causes 80% to 90% of lung cancers with a relative risk in men of over 20 and in women of over 10 (Thun et al 1995). Smoking is responsible for most cancers of the upper respiratory and alimentary tracts (lip, tongue, mouth, pharynx and larynx) and for a smaller fraction of cancers of the bladder, pancreas, oesophagus and kidneys. Over 80% of chronic obstructive lung disease can be attributed to smoking with a relative risk in both male and female smokers of about 10.

The relative risk for cardiovascular disease is about 10 in smokers aged 30-50 years, but this risk declines with increasing age as death rates from heart disease rise in

non-smokers (Parish et al 1995). Across all ages, about 20% of cardiovascular deaths can be attributed to smoking. However, because cardiovascular disease is so common in the population, smoking attributable deaths from cardiovascular diseases (ischaemic heart disease, aortic aneurysm, and stroke) outnumber smoking-attributable deaths from all other causes, including lung cancer.

Smoking is a cause of peripheral vascular disease, cataracts, macular degeneration, Crohn's disease, gastric and duodenal ulcers, hip fracture in the elderly, and periodontitis, the major cause of tooth loss in adults (Wald & Hackshaw 1996).

Smoking is a major cause of adverse pregnancy outcomes, including perinatal death, an increased risk of spontaneous abortion, and a doubled risk of ectopic pregnancy (Poswillo & Alderman 1992). Babies of smoking mothers weigh on average 150g to 250g less at birth than do babies of non-smoking mothers. Smoking is causally associated with sudden infant death syndrome, although it is uncertain whether prenatal or postnatal exposure is more important (Anderson & Cook 1997).

The relative risks, the absolute excess risk per 100,000 people per year and the proportion of all deaths from the specified diseases or the proportion of the incidence of the specified conditions due to smoking are summarized for selective conditions in Tables 3.1-3.3.

**Table 3.1** Fatal diseases associated with smoking. Data from study of male British doctors (Doll et al 1994).

Disease		Relative risk <sup>1</sup>	Absolute risk per 100,00 men per year <sup>2</sup>	Attributable proportion (%) <sup>3</sup>
Cancers	Lung	15.0	195	81
	Upper respiratory sites	24.0	23	87
	Bladder	2.3	17	28
Cardiovascular diseases	Ischaemic heart disease	1.6	320	15
	Cerebrovascular disease	1.3	51	8
	Aortic aneurysms	4.1	47	48
Respiratory diseases	Chronic obstructive pulmonary disease	12.7	117	78

<sup>1</sup> Calculated as the standardized mortality per 100,000 men per year in current cigarette smokers divided by the standardized mortality in life-long non-smokers

<sup>2</sup> Calculated as the standardized mortality per 100,000 men per year in current cigarette smokers less the standardized mortality in life-long non-smokers

<sup>3</sup> The proportion of all deaths from the specified disease attributable to smoking, assuming 30% of the male adult population are current smokers and that all the excess risk in smokers is due to smoking.

**Table 3.2** Fatal diseases associated with smoking. Data from American Cancer Society Study (CPSII). Men (M) and women (F) aged 35 years or more. (Surgeon General Report 1989).

Disease			Relative risk <sup>1</sup>	Absolute risk per 100,000 people per year <sup>2</sup>	Attributable proportion (%) <sup>3</sup>
Cancers	Lung	M	22.4	513	87
		F	11.9	195	77
	Upper respiratory sites	M	24.5	26	89
		F	5.6	8	58
	Bladder	M	2.9	35	36
		F	2.6	13	32
Cardiovascular diseases	Ischaemic heart disease	M	1.9	470	22
		F	1.8	302	19
	Cerebrovascular disease	M	2.2	181	27
		F	1.8	198	20
	Aortic aneurysms	M	4.1	74	48
		F	4.6	41	52
Respiratory diseases	Chronic obstructive pulmonary disease	M	9.7	339	72
		F	10.5	195	74

<sup>1</sup> Calculated as the standardized mortality per 100,000 people per year in current cigarette smokers divided by the standardized mortality in life-long non-smokers

<sup>2</sup> Calculated as the standardized mortality per 100,000 people per year in current cigarette smokers less the standardized mortality in life-long non-smokers

<sup>3</sup> The proportion of all deaths from the specified disease attributable to smoking, assuming 30% of the adult population are current smokers and that all the excess risk in smokers is due to smoking.

**Table 3.3.** Some selected non-fatal diseases associated with smoking.

	Relative risk <sup>1</sup>	Absolute risk per 100,000 people per year <sup>2</sup>	Attributable proportion (%) <sup>3</sup>
Peripheral vascular disease (aged 45-74 years) (Surgeon General report 1983)	2.0	150	23
Peptic ulcer disease (aged 20-61 years) (Johnsen et al 1994)	3.8	165	45
Crohn's disease (Logan 1990)	2.1	10	25
Periodontitis (aged 19-40 years) [prevalence] Haber (1994)	3.0	44,500	38
Hip fracture (aged >64 years) (Law et al 1991)	1.3	134	8
Cataracts (men aged 40-84 years) (Christen et al 1992)	2.2	296	26

<sup>1</sup> Calculated as the standardized incidence per 100,000 people per year in current cigarette smokers divided by the standardized incidence in life-long non-smokers

<sup>2</sup> Calculated as the standardized incidence per 100,000 people per year in current cigarette smokers less the standardized incidence in life-long non-smokers

<sup>3</sup> The proportion of all cases from the specified disorder attributable to smoking, assuming 30% of the population are current smokers and that all the excess risk in smokers is due to smoking.

Smoking cessation benefits health at any age, the more so the younger the smoker is when he or she stops. In the British doctor's study, those who gave up smoking by their mid-thirties had a life expectancy indistinguishable from never smokers (Doll et al 1994). Even those who gave up smoking in their late 60s lived significantly longer than continuing smokers.

As people in lower socio economic groups smoke more than people in higher groups, so smoking related deaths are higher in lower than higher socio-economic groups. Smoking causes at least half of the socio-economic differences in overall mortality rates (Bobak et al 2000).

### ***Dependence on tobacco products***

Tobacco is a dependence producing drug due to its nicotine content (Royal College of Physicians 2000). Nicotine has been shown to have effects on brain dopamine systems similar to those of other drugs such as heroin and cocaine (Pich et al 1997). With appropriate reward schedules it functions as a robust reinforcer (Balfour 2003). Dependence on nicotine is established early in teenagers' smoking careers (Peck et al 2002). Much adult smoking behaviour is motivated by a need to maintain a preferred level of nicotine intake, leading to the phenomenon of nicotine titration, or compensatory smoking in response to lowered nicotine yields (Russell 1990). People seeking treatment for heroin, cocaine, or alcohol dependence rate cigarettes as hard to give up as their other drug of dependence (Kozlowski et al 1989). The cost of nicotine withdrawal is an important factor underlying the failure of many attempts at cessation (Peck et al 2002).

### ***Neuropsychiatric disorders***

Smokers perceive that smoking helps alleviate negative mood states, but the available evidence suggests that the only negative mood state so alleviated is that resulting directly from dependence on nicotine itself (See Royal College of Physicians of London 2000). Thus, the nicotine in tobacco relieves nicotine withdrawal symptoms, but does not have any mood enhancing properties in non-addicted individuals. If anything, the experience of being addicted to tobacco appears to add to, rather than relieve stress in the everyday lives of smokers.

Although relatively few smokers report that they smoke primarily to help them think and concentrate, the evidence suggests that nicotine can improve certain aspects of cognitive performance, although the size of the effect is small (Heishman 1998).

Although previous studies had suggested an inverse relationship between smoking and Alzheimer's dementia, more recent studies have in fact suggested either no relationship (Doll et al 2000) or a positive relationship (Ott et al 1998). Depression has consistently been linked with smoking. A history of major depression is associated with a greater prevalence of smoking and less success in smoking cessation (Kinnunen et al 1996). There is evidence for an inverse dose-response relationship between smoking and the risk of Parkinson's disease (Grandinetti et al 1994). People with schizophrenia have a much higher smoking rate than people with other mental disorders, an association which has been postulated as "self-medication" (Simpson et al 1999).

### ***Cancers***

Tobacco smoke contains more than 100 carcinogens and mutagens, many of which are classified as carcinogens based upon human and animal studies (IARC 1986). If a regular smokers quits, then the risk of cancer decreases, but the risk of cancer in former smokers does not decrease to the level of never smokers.

A dose response relationship between cigarette smoking and lung cancer exists for both men and women (Institute of Medicine 2001). Both daily smoking amounts and duration of smoking are important contributors to risk. An earlier age of initiation is associated with increased risk. The depth of inhalation is associated with increased risk.

The British doctors' study found a cumulative risk for lung cancer by age 75 years among continuing male smokers of 15.9%. The cumulative risk was 9.9%, 6.0%, 3.0% and 1.7% for those who stopped at about 60, 50, 40 and 30 years of age respectively (Peto et al 2000). For women, the cumulative risk for lung cancer by age 75 among continuing smokers was 9.5%, compared with 5.3% and 2.2% among women who stopped at about 60 and 50 years of age respectively. After about 20 years of quitting, the risk reduction is found to plateau, remaining slightly above that of never smokers.

There is a dose response relationship between cigarette smoking and the risk of oropharyngeal cancers (cancers of the oral cavity, tongue, pharynx and larynx) (Institute of Medicine 2001). Stopping smoking reduces the risk of oropharyngeal cancers, with most reductions in risk apparent as soon as five years after cessation (Tonstad 2003).

There is a dose response relationship between cigarette smoking and risk of bladder cancer, related to both the duration of smoking and the number of cigarettes smoked per day (Institute of Medicine 2001). An immediate decrease in risk of bladder cancer is observed for those who give up smoking, although, even after 25 years, the decrease in risk does not reach the level of never smokers (Zeegers et al 2000).

### ***Cardiovascular diseases***

Smoking significantly increases the risk of myocardial infarction, sudden coronary death, stroke, peripheral vascular disease and abdominal aortic aneurysms. The risk of coronary heart disease is substantially and relatively rapidly reversible on cessation of smoking. One year after quitting, the risk of coronary heart disease decreases by 50%, and within 10 years, the relative risk of dying from coronary heart disease for an ex-smoker approaches that of a never smoker.

There is a dose response relationship between cigarette smoking and risk of coronary artery disease, such that the risk increases with the number of cigarettes smoked daily, the extent of inhalation, and the number of years of smoking (Institute of Medicine 2001). The risk of coronary heart disease is more than doubled in cigarette smokers as a group. Middle-aged men who smoke have a tenfold greater risk of sudden cardiac death and a 3.6-fold increased risk of myocardial infarction than non-smokers (Kannel et al 1984).

Smoking promotes acute coronary events by having an immediate effect on increasing heart muscle oxygen demand, through a rise in blood pressure, heart rate and heart muscle contractility (Institute of Medicine 2001). Smoking causes vasoconstriction and reduced flow in the coronary arteries. Oxygen delivery is reduced to heart muscle cells. An increase in fibrinogen and platelet activity increases the risk of thrombosis. After eight weeks, smoking cessation normalizes elevated blood viscosity and plasma fibrinogen levels (Tonstad 2003).

At all ages, the risk of ischaemic heart disease in individuals without known coronary heart disease decreases after cessation, particularly in the first two to three years



(Hays et al 1998). Thereafter the rate of decline decreases, so that it may take up to ten years for former smokers to reach the same risk level as never smokers. The risk for the first myocardial infarction declines quickly to reach that of never smokers by the third or fourth year (Rosenborg et al 1985; Rosenborg et al 1990). For smokers who already have coronary heart disease, cessation is also very effective in reducing the risk of further acute coronary events.

Smoking increases the risk of cerebrovascular disease in a dose response manner, for both subarachnoid haemorrhage and cerebral infarction, which occurs in conjunction with an increase in atherosclerosis of the carotid arteries. (Shinton & Beevers 1989). The increased relative risk for cerebrovascular disease is lowered by smoking cessation to that of a non-smoker by about five years (Colditz et al 1988; Wolf et al 1988).

There is a dose-response relationship between smoking and risk of peripheral vascular disease (Price 1999). Smoking markedly accelerates atherosclerosis in the abdominal aorta and occlusive disease in its branches (Reed et al 1987). Aortic aneurysm and renal artery stenosis are increased in smokers. Cigarette smoking is an independent risk factor in the development of atherosclerosis in the internal pudendal and penile arteries of young men with impotence (PDAY 1990). Smoking cessation reduces the risk of peripheral artery occlusive disease compared with continued smoking (Centers for Disease Control 1990). Among patients with peripheral artery disease, smoking cessation improves exercise tolerance, reduces the risk of amputation after peripheral artery surgery, and increases overall survival.

### ***Respiratory diseases***

Numerous respiratory diseases are strongly related to cigarette smoking (Murin et al 2000). Cigarette smoking is estimated to contribute to over 80% of cases of chronic obstructive pulmonary disease (COPD), and the amount and duration of cigarette smoking directly influence the progression of COPD. Asthma and respiratory infections are not caused by tobacco smoke but are worsened by exposure to cigarette smoke.

Cigarette smoking is associated with a lower forced expiratory volume in 1 second (FEV<sub>1</sub>), a measure of lung function impairment, and with an accelerated decline in FEV<sub>1</sub> over time (Sherman 1991; Sherman et al 1992). Both the duration of smoking and the amount smoked are significant predictors of lung function impairment. The Lung Health Study found a reduced rate of decline in lung function and fewer respiratory symptoms in those who remained quitters over the five year duration of the trial (Anthonisen et al 1994). The benefit was seen also in heavy smokers, older smokers and smokers with poor baseline lung function.

### ***Gastrointestinal diseases***

Cigarette smokers have an increased risk of peptic ulcer disease with relative risks of between 3.0 and 3.4, increased rate of relapse after treatment, and increased risk of the complications associated with ulcer development (Kato et al 1992). Ulcer healing and the risk of recurrence improve with cessation (Tatsuka et al 1987).

Cigarette smoking leads to a three to fivefold increased risk of developing Crohn's disease (Rhodes and Thomas 1994). Smokers with Crohn's disease have an increased risk of developing severe disease, and have a greater risk of requiring surgery and of having post surgical complications (Thomas et al 2000). Smoking cessation leads to a decreased risk of developing Crohn's disease, and a decrease in the need for surgery amongst those with Crohn's disease and a decrease in recurrence after surgery (Institute of Medicine 2001).

In contrast, smoking has been shown to have a protective effect for ulcerative colitis and a better course for those with ulcerative colitis (Thomas et al 2000).

### ***Diabetes***

There is evidence for a dose response relationship between cigarette smoking and the risk of non-insulin dependent diabetes mellitus (see Muhlhauser 1994; Hu 2001; Institute of Medicine 2001). There is also the suggestion that smoking is an independent risk factor for increased insulin resistance. Smoking increases the risk of cardiovascular disease in diabetes (Hoffner 1998).

### ***Renal disease***

Cigarette smoking is associated with a two to three fold increased risk of microalbuminuria and proteinuria and an increased rate of progression to diabetic nephropathy and end stage renal disease in individuals with diabetes (Orth 2000; Ritz et al 2000). In individuals without diabetes, there is a dose response relationship between cigarette smoking and several measures of abnormal renal function, including high-normal albuminuria, microalbuminuria and abnormal glomerular filtration rates (Pinto-Sietsma et al 2000). Smoking cessation was associated with only microalbuminuria, suggesting some degree of reversibility with quitting.

### ***Reproductive and developmental effects***

Smoking among women of reproductive age is a critical risk factor for reproductive health problems, including foetal and infant mortality and impaired foetal development. Cigarette smoking increases the risks of fertility impairment in women and vascular erectile dysfunction, but not fertility impairment in men (Institute of Medicine 2001). Cigarette smoking increases the risks of spontaneous abortions, low birth weight, preterm delivery, perinatal morbidity, placental complications and sudden infant death syndrome (Institute of Medicine 2001). Among pregnant smokers, the risk of low birth weight babies is doubled compared to non-smokers (Centers for Disease Control and Prevention 2000). The effect of smoking is particularly prominent with exposure after the first trimester. Women who stop smoking during pregnancy have significantly increased birth weights compared to women who continue to smoke (Instituted of Medicine 2001). The risk of sudden infant death syndrome increases two- to four- fold among infants of mothers who smoke during pregnancy, and the risks increase even further when combined with postnatal exposure to tobacco smoke (Leach et al. 1999).

### ***Post-operative complications***

Smokers have an increased risk of intra-operative and postoperative complications, including pulmonary, circulatory and infectious complications, impaired wound healing and postoperative need for intensive care (Tonstad 2003). A randomized controlled trial of a smoking intervention program in Denmark found that smoking cessation 6 to 8 weeks before surgery led to fewer wound-related complications, tended to reduce cardiovascular complications and the need for secondary surgery, and led to a shorter hospital stay (Möller et al. 2002). The long-term risks for myocardial infarction, re-operation or death after coronary bypass surgery are increased in smokers (Voors 1998).

### ***Oral disease***

Cigarette smoking is a major risk factor for periodontal disease, with a dose response relationship (Bergstrom et al. 2000). Smoking cessation improves gingival health, and there is evidence of a decrease but not a complete reversal in the severity and prevalence of periodontitis among former smokers.

### ***Joint and Bone disease***

Cigarette smoking seems to increase the risk of development of rheumatoid arthritis (Uhlig et al 1999), although it is not certain whether smoking plays a casual role in the aetiology or the progression of rheumatoid arthritis. The Iowa Women's Health Study found that current smokers, and those who had stopped within 10 years, were at increased risk of rheumatoid arthritis, whereas those who had stopped for more than 10 years were not at increased risk (Criswell et al 2002).

Cigarette smoking has been linked to adverse orthopaedic consequences including osteoporosis, hip fracture and delay in bone healing, with some evidence of a dose response relationship (Institute of Medicine 2001). Reversal of the risk for hip fractures has been described 10-20 years post cessation (Cornuz et al. 1999).

### ***Eye disease***

Cigarette smoking is associated with numerous diseases of the eye, including ischaemic diseases such as amaurosis fugax, macular degeneration (Vingerling 1996), retinal infarction and anterior ischaemic optic neuropathy (Solberg et al 1988). There is a dose response relationship between cigarette smoking and risk and severity of cataracts, with a doubling of risk for nuclear type cataracts and a two to four fold increase in the rate of cataract surgery (Delcourt et al 2000). The risk of cataract formation appears to be related to lifetime cumulative cigarette dose, with less reduction in risk found among heavy smokers compared to moderate and light smokers after cessation (Christen et al 2000).

### ***Skin diseases***

There is a dose response relationship between cigarette smoking and wrinkling independent of age, gender and sun exposure and of psoriasis (Smith & Fenske 1996).

### ***Environmental tobacco smoke***

Cigarette smoke not only causes harm to the smoker, but also to those surrounding the smoker through environmental tobacco smoke. A non-smoker inhales side stream smoke from the burning tip of the cigarette as well as mainstream smoke breathed out by the smoker. In addition to the unpleasant smell and irritation to the eyes, environmental tobacco smoke increases the risks of lung cancer and cardiovascular and respiratory diseases.

The risk of lung cancer is about 24% higher for non-smokers who have a spouse who smokes, relative to non-smokers whose spouses are also non-smokers (Hackshaw et al 1997).

The risk of coronary heart disease is also about 23%-25% higher for non-smokers women who have a spouse who smokes, relative to non-smokers whose spouses are also non-smokers (Law et al 1997; He et al 1999). It seems that even a small exposure to second hand smoke has a large effect on heart disease, with further exposure having a relatively small additional effect. The increased risk has almost all gone after two years of non-exposure to second hand smoke.

Although it is unclear whether or not environmental tobacco smoke increases the risk of chronic obstructive pulmonary disease or asthma in adults, there is evidence that environmental tobacco smoke increase the risk of impaired lung function, asthma, and lower respiratory infections in children (Institute of Medicine 2001).

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#### 4. MEASURES TO REDUCE TOBACCO USE

##### Summary of chapter evidence

**Effective policy measures to reduce tobacco use** An effective tobacco policy is a comprehensive one, which: promotes public health through increases in tobacco prices, total bans on marketing of tobacco products, effective product regulation, and restrictions on availability; creates supportive environments through smoke free workplaces and counter advertisements; develops personal skills through mass media and education campaigns; and underpins community action through the creation of non-governmental organizations and coalitions. The Framework Convention on Tobacco Control is an international legally binding agreement to reduce tobacco use.

**Smoking cessation is a part of tobacco policy** Smoking cessation is an essential component of tobacco control. The Framework Convention on Tobacco Control requires its signatories to develop and disseminate appropriate, comprehensive and integrated guidelines for the treatment of tobacco dependence, and to promote cessation of tobacco use and adequate treatment for tobacco dependence.

##### Recommendations

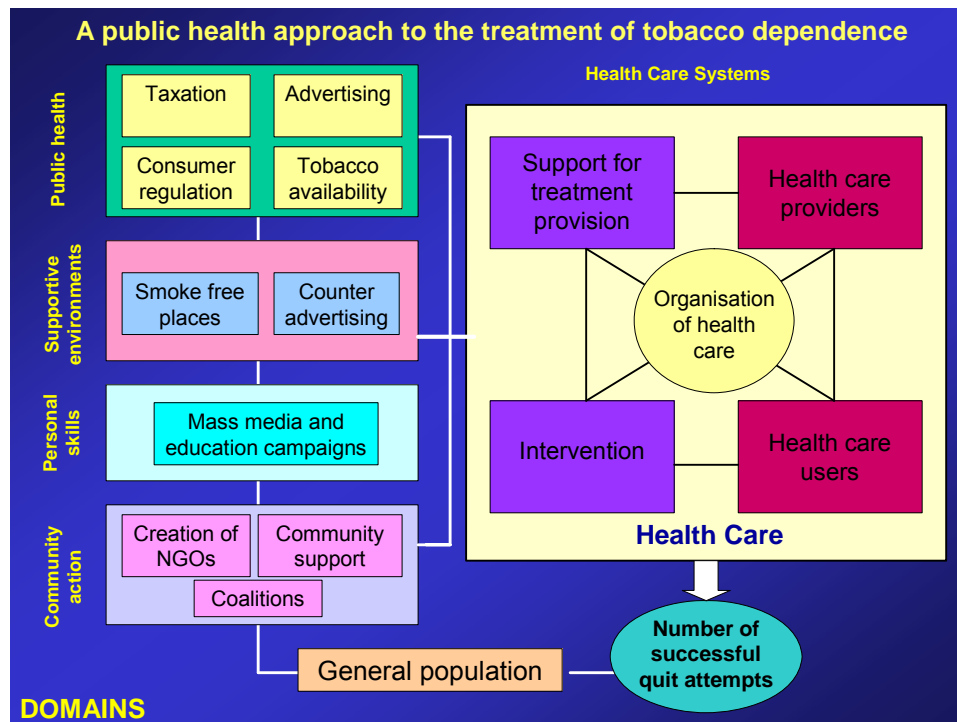
**The Framework Convention on Tobacco Control** requires immediate and extensive implementation. The impact of treatment services will be severely diminished in a permissive environment where tobacco products are cheap, used without restriction in public and work places, and are readily promoted and marketed.

The use of tobacco products is highly dependent on factors external to the individual. Raising the price of tobacco products increases the number of stop attempts, the demand for treatment to help stop and the number of successful long term stop attempts. Likewise, the introduction of smoke free public places, and in particular work places, increases the motivation to stop and the number of successful stop attempts. Further, changing the social climate around smoking and removing cues to smoking such as advertising and sponsorship have an impact on smoking and are likely to prevent relapse following a successful stop attempt.

The environment conducive for an effective service for the treatment of tobacco dependence can be organized in a hierarchical and multi-linked structure. A public health approach can be used (Detels et al 2002), based on relevant publications of the World Health Organization (Blanke 2003; Hafey et al 2003; World Health Organization 2000a; 2000b; 2001; 2002; 2003a 2003b; 2003c; 2004), the World Bank (De Beyer & Brigden 2003; Jha & Chaloupka 2000), Health21, the health policy framework of the World Health Organization (1998) and the Framework Convention on Tobacco Control (World Health Organization 2003d).

Five dimensions can be defined and structured by the Ottawa Charter for Health Promotion (World Health Organization 1986), public health, supportive environments, personal skills, community action and health care systems. Each dimension comprises a number of different domains, Figure 4.1.





**Figure 4.1** Domains in each of the five dimensions of the Ottawa Charter

**The public health dimension** contains domains that include increases in the price of cigarettes (Tauras & Chaloupka 2005); bans on all forms of direct and indirect advertising and sponsorship (Doungas et al 1995; Saffer 2000; Saffer & Chaloupka 2000); consumer protection including product regulation and product description (Henningfield et al 1998); and restrictions or regulations on the availability of tobacco products (Chaloupka et al 2000a; 2000b), all policy measures which can increase quit attempts and sustained quitting.

### **Price and tax**

An increase in the price and tax of tobacco products is one of the most effective methods to reduce the harm done by tobacco. According to calculations of the World Bank tobacco use will decrease by 4% when the price increases by 10% in high income countries (World Bank 1999). Increasing the price of tobacco products increases the use of treatment products. A 10% increase in the price of cigarettes will increase demand for nicotine patch and gum by approximately 8%. Price increases will have a disproportionate effect on young smokers and smokers with lower incomes. Measures include:

- ☞ Maintain high prices and taxes on tobacco products;
- ☞ Increase tax on tobacco products more than inflation and salary increase;
- ☞ Ensure equal taxes on all tobacco products to prevent substitution due to price increase;
- ☞ Take the costs of tobacco products out of the consumer price index;
- ☞ Prohibit all tax and duty free sales of tobacco products; and
- ☞ Allocate (hypothecate) a proportion of the income from tobacco taxes in order to finance national campaigns and other activities focussed on non-smoking.

Tobacco tax increases increase tax returns. This is due to the inelasticities in tobacco taxes. People who quit smoking cause less of a decrease in tax returns than people

who continue to smoke despite higher taxes. The World Bank has estimated that a 10% increase in tax on cigarettes would yield an increase in tax of 7%. It has also been argued that an increase in taxes will lead to an increase in smuggling. However, even if this is the case, the major consequence of an increase in price will be a decrease in consumption. Strict regulation is necessary to minimize smuggling. Finally, it is argued that tobacco taxes are regressive, having a disproportionate impact on poorer smokers. Although poorer smokers spend a higher proportion of their income on smoking than less poor smokers, this argument should not outweigh the health gains that can be accomplished. Policies that support quitting amongst lower income smokers will reduce the socio-economic mortality differentials between higher and lower income groups.

### ***Illegal trade***

Illegal trade in tobacco products not only threatens public health, but defrauds customs and excise and strengthens criminal organizations and corruption. Unless smuggling is nationally and internationally controlled, the impact of other measurements in tobacco control will be undermined. Measures include:

- ☞ All tobacco products sold or produced should be marked to allow tracing;
- ☞ Collecting data on the trade of tobacco products to other countries, including illegal trade and exchanging information between relevant national authorities and institutions; and
- ☞ Implementing and/or strengthening regulation and penalties.

### ***Advertisement, promotion and sponsoring***

A total ban on the advertisement, promotion and sponsorship of all tobacco products valid for all media and direct and indirect forms of advertising will contribute to a reduction in the consumption of tobacco products and to a change in cultural attitudes to smoking, especially among young people. Measures include:

- ☞ A total ban on direct and indirect advertisement of tobacco products in all media, including promotion, brand stretching and sponsorship; and
- ☞ Adoption of monitoring measures to ensure that bans are adhered to.

### ***Product control and consumer information***

To reduce the harm done by the carcinogen and toxic products in tobacco smoke, strict product control is necessary. Visible and clear health warnings can inform consumers. Measures include:

- ☞ Adoption of standards for regulation of tobacco products, including standards for testing and measuring, development, production and manufacturing of products;
- ☞ Listing of ingredients in tobacco products by all producers, including details of major ingredients and additives, composition of tobacco smoke, toxicity, carcinogenicity and addictiveness;
- ☞ Ban on the descriptors “mild”, “light”, “low tar”, “ultra light”, etc. or any other terms that might suggest one product to be safer than other products. Packages must not promote misleading or false information;
- ☞ Ensure that every package of tobacco products includes strong health warnings according to international guidelines; and
- ☞ Ensure that warnings on tobacco products give clear information on the toxic elements of the product, including tar, nicotine and carbon monoxide content. These warnings should cover no less than 40% of both sides of the package.

### ***Availability to youth***

Implementation of an age limit for buying tobacco products is difficult, unless strict regulation is in place. Retailers should have a license to sell and all impersonal points of sale and promotion should be abolished. Measures include:

- ☞ Prohibition of sales of tobacco products to youth who are not of age;
- ☞ Prohibition of sales through vending machines, self service points, via post order or electronic sales, sales of single or unpacked products and distribution of free samples; and
- ☞ Licensing of tobacco product retailers.

**The supportive environments dimension** contains domains that include smoke free public and workplaces (Fisher et al 1990; Hymowitz et al 1991; Moher et al 2003) and the promotion of counter advertising, environmental measures which can increase quit attempts and sustained quitting (Kenkel & Chen 2000).

### ***Environmental tobacco smoke***

The protection of non-smokers and children from environmental tobacco smoke is a priority for tobacco control policy. Smoke free places lead to a decrease in consumption and smoking prevalence, and to a shift in cultural attitudes against smoking. Even the hotel and catering industry workplaces should become smoke free. A fear of a reduction in clients is unfounded. Several studies have shown that smoke free restaurants do not prevent customers from coming, and may even increase customers. Measures include:

- ☞ Extension of smoke free public places, to all transportation and workplaces, including educational and health care institutions, and hotels, bars, cafes and restaurants; and
- ☞ Classification of environmental tobacco smoke as a carcinogen in order to protect employees and to speed up the implementation of smoke free workplaces.

**The personal skills dimension** through educational programmes and mass media campaigns (World Health Organization 2003b; Schar & Gutierrez 2001) can increase the population's knowledge about the harm done by tobacco, the different options available to engage in quit attempts, including the availability of effective treatments, and the skills needed for successful quit attempts.

### ***Information, training and public awareness***

Regular and intensive information campaigns and educational programs are effective in reducing tobacco use and in mobilizing public support for the introduction of effective policy instruments such as tax increases. Measures include:

- ☞ Development and implementation of effective training and education regarding tobacco control for policy makers, health care providers, students, teachers and other relevant focus groups;
- ☞ Promotion and extension of education, training and public awareness campaigns;
- ☞ Assurance that the whole of the population with an emphasis on children, the young and high-risk groups, are fully informed of the addictiveness of tobacco, the harm done by tobacco, the harm done by environmental tobacco smoke, and the positive effects of smoking cessation; and
- ☞ Involvement and participation of public organizations, non-governmental organizations and the population in the development of strategies for tobacco control.

The community action dimension includes the creation of coalitions and partnerships (World Health Organization 2003b), the creation of non governmental organizations (World Health Organization 2003b), and the development of community support to reframe cultural norms (Lindstrom et al 2003), all of which can impact on successful smoking cessation. Partnerships can increase the commitment and the pool of

financial and technical support for implementing evidence-based treatment (Anderson 2002). Partners include: auditors; consumer and patient organizations (NGOs); drug regulatory authorities; employment and business sector; media and entertainment industries; health care systems; insurance companies; legal sector; media and public service sector; ministries of finance; pharmaceutical sector; quality of care organizations; and the research community (Anderson 2003).

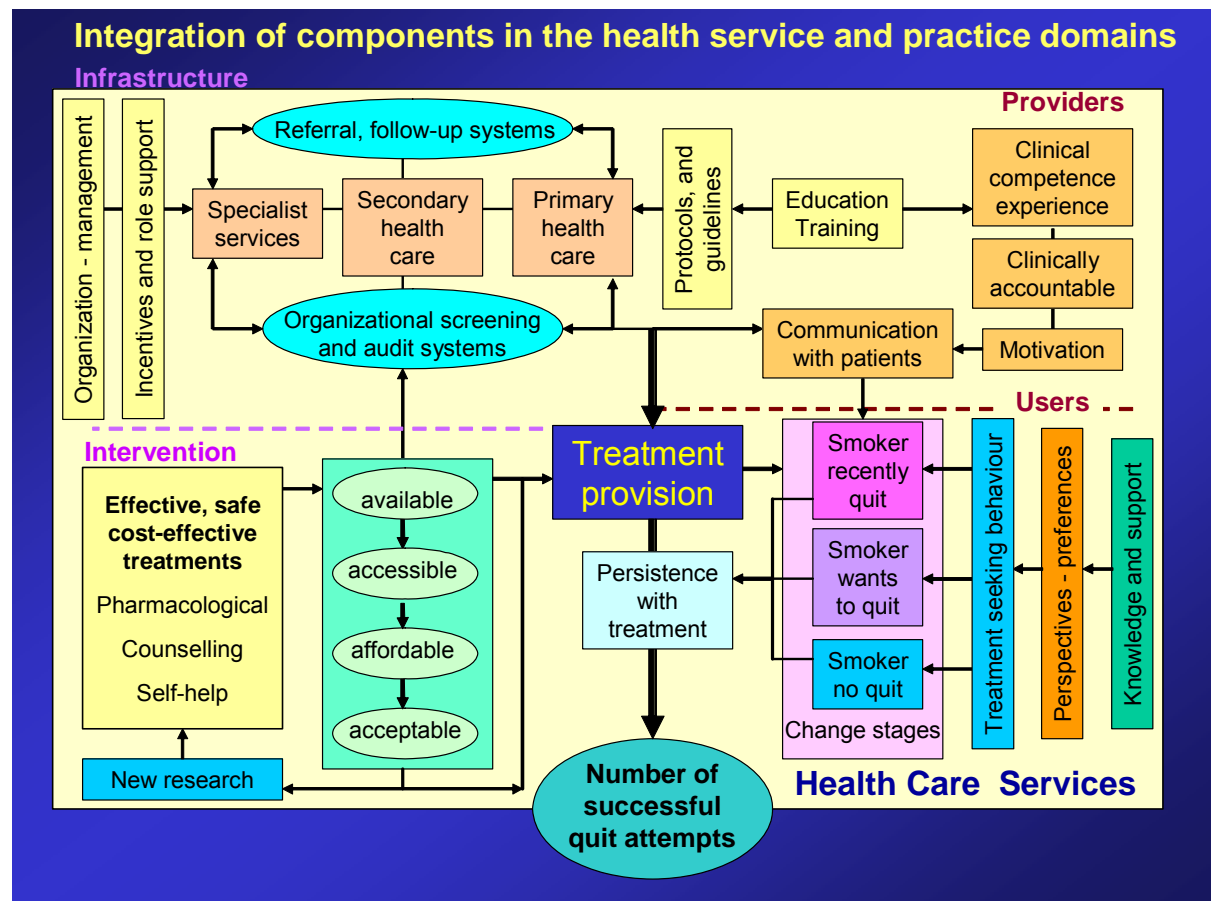
**The health care systems dimension**, which includes the five domains of organization of health care, support for providing treatment, availability of effective treatments, provision of effective treatment by health care providers and uptake of effective treatment by health care users (Figure 4.2) will be the content of the rest of this report.

### ***Smoking cessation***

Smoking cessation is an essential component of tobacco control. Advice, (behavioural) support and the use of pharmacotherapy are effective ways to motivate smokers to stop smoking. Measures include:

- ☞ Implementation of age and gender related programs to stimulate smokers to stop smoking;
- ☞ Integration of effective forms of treatment of tobacco dependence in national health programs;
- ☞ Promotion and extension of education and training in smoking cessation for physicians, nurses, pharmacists, dentists and others; and
- ☞ Promotion and extension of smoking cessation programs and support in health care settings, especially in primary health care.

The global Framework Convention on Tobacco Control requires its signatories to develop and disseminate appropriate, comprehensive and integrated guidelines for the treatment of tobacco dependence, and to promote cessation of tobacco use and adequate treatment for tobacco dependence (World Health Organization 2003d). In particular, signatories should design and implement effective programmes aimed at promoting the cessation of tobacco use; include diagnosis and treatment of tobacco dependence and counselling services on cessation of tobacco use in national health programmes, plans and strategies; establish programmes for diagnosing, counselling, preventing and treating tobacco dependence in health care facilities; and collaborate with other Parties to facilitate accessibility and affordability for treatment of tobacco dependence including pharmaceutical products.



**Figure 4.2** Components of health service domains

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## 5. THE EFFECTIVE OF SMOKING CESSATION INTERVENTIONS

### Summary of chapter evidence

**Behavioural support is effective for stopping smoking** Behavioural support is effective in helping smokers to stop smoking. Forty smokers need to be advised for one to stop. The effectiveness can be increased with longer, more frequent and more intensive support. Neither the mode of support, nor the use of additional materials or support adds much to the effectiveness.

**Pharmacological support is effective for stopping smoking** Combined with behavioural support, nicotine replacement products are effective in helping smokers who smoke more than 10 cigarettes a day to stop smoking. Fourteen smokers need to receive a product for one to stop. It does not seem to matter which type of nicotine replacement product is used. When combined with behavioural support, both bupropion (eleven smokers to receive product for one to benefit) and nortyptiline (ten smokers to receive product for one to stop) are effective in helping smokers to quit.

### Recommendations

**Every person coming into contact** with the health care sector needs to be asked about their smoking; every smoker needs to be advised to stop smoking, with the offer of pharmacological help to every smoker who smokes more than 10 cigarettes a day. Although much has been achieved through the health care sector, the availability of support for smoking cessation remains severely limited, and the full potential of the health care sector grossly underutilized. A much greater investment is required to integrate smoking cessation into routine clinical care, for which all health care providers should be accountable and competent.

Effective intervention strategies for the treatment of tobacco dependence include self-help, counselling and pharmacological strategies. However, in most situations treatment strategies are combined, leading to improved outcomes (World Health organization 2003).

Evidence on effectiveness (and efficacy) of different treatment strategies needs to be available for health care users and providers, so rational clinical choices of treatment options can be made. Sources include systematic reviews (Sutherland 2003; Fagerstrom 2003), meta-analyses (Abbot et al 2003; David et al 2003; Gourlay et al 2003; Hajek & Stead et al 2003; Hughes et al 2003a, 2003b; Lancaster & Stead 2003a, 2003b, 2003c, 2003d; Moller et al 2003; Park et al 2003; Rice & Stead 2003; Rigotti et al 2003; Silagy et al 2003; Silagy & Stead 2003; Stead & Lancaster 2003; Stead et al 2003; Stead & Hughes 2003; Ussher et al 2003; van de Meer et al 2003; White et al 2003) and published clinical guidelines (Raw et al 1998; West et al 2000; Fiore et al 2000; Kwaliteitsinstituut voor de Gezondheidszorg 2003). Evidence needs to be provided for the effectiveness of different treatment strategies for different population groups and for different combinations of treatments (Fiore et al 2000).

Evidence on the safety of treatments needs to be available for health care users and providers, so rational clinical choices of treatment options can be made, including, for example, the use of nicotine replacement therapy in patients with cardiovascular



disease and pregnancy (West et al 2000; McNeil et al 2001) and the safety profile of bupropion (Committee on safety of medicines 2002).

Evidence on the cost-effectiveness of treatments needs to be available for health care planners and managers, so rational management choices can be made on the allocation of resources. The costs of smoking cessation interventions are very low compared to the resulting gains in terms of avoided mortality, morbidity and costs of care for smoking related diseases. International reviews suggest that costs per life-year gained vary between €215 and €6,200 when compared with usual care or no intervention (Feenstra et al 2003). The estimates compare very favourably with an average cost effectiveness of €30,000 for typical health care interventions.

Cost effectiveness analysis in the Netherlands found that minimal counselling in general practice saved health care costs. For every €10 spent on minimal counselling in general practice, €27 would be saved in health care costs. The costs per (quality adjusted) life-year for other interventions were €1400 for minimal GP counselling with NRT, €4900 for intensive counselling with NRT, €3400 for intensive counselling with bupropion and €1100 for tailored telephone counselling (Feenstra et al 2003).

Effective treatment available in the health care system is an obligation of Member States of the World Health Organization, since tobacco dependence is a recognized clinical disorder (World Health Organization 2002).

Effective and safe pharmacological treatments for tobacco dependence need to be licensed for use. Indications for use should be available and clear including the use of treatment products for different population and disease groups (McNeill et al 2001). The more available pharmacological treatment is, the greater the number of quit attempts (Hughes et al 2003c) and the greater the cost effectiveness (World Bank 1999).

Effective treatment accessible in the health care system increases the number of quit attempts (Ranson et al 2000). Counselling should be available and accessible in as many different settings as evidence suggests, including telephone counselling, community clinics, primary health care services, secondary and hospital based services and specialist services. Depending on the product, pharmacological treatments should be accessible on prescription, in pharmacies, in general stores and retail outlets and through mail order. Successful cessation rates in the United States were increased by 10%-25% by the introduction of nicotine replacement products in general stores above the cessation that would have occurred if the products were available on prescription only (Shiffman et al 1997).

Effective treatment affordable for all users increases the number of quit attempts (Levy & Friend 2002a, 2002b; Schauffer et al 2001). Requiring patients to pay out of pocket for medications provides an unbearable barrier for many lower income smokers (Henningfield 2000). In the United States, the use of nicotine replacement treatment products is highest in those insurance plans that provide full coverage reimbursement as opposed to those plans that require members to pay a share cost (Curry 1998).

Introduction of reimbursement of the costs of treatment for smokers in an area of the Netherlands increased the number of quit attempts from 24% amongst smokers for whom treatment was not reimbursed to 32% amongst smokers for whom treatment was reimbursed (Kaper et al 2003). It seemed that reimbursement had a greater effect in increasing quit attempts amongst smokers with lower rather than higher income. After the end of the six month reimbursement period, the effects on quit

attempts disappeared, although six months later (twelve months after the introduction of reimbursement), 16% of smokers for whom treatment was reimbursed had successfully quit smoking, compared with 10% of smokers for whom treatment was not reimbursed. It was estimated that if the programme was implemented throughout the country, it could lead to a 2.4%-3.6% decline in the number of smokers.

Effective treatment acceptable for all users increases the number of quit attempts. Pharmacological treatments for tobacco dependence should take into account the acceptability of their different options for users including product size, packaging, product design, information about the product and its side effects (Henningfield 2000).

New research for improvement of effectiveness includes: elements of behavioural interventions that will enhance effectiveness; ways of enabling healthcare professionals to deliver routine opportunistic advice to stop smoking more often; the use of combinations of different forms of nicotine replacement therapy; effectiveness of combining nicotine replacement therapy and non-nicotine pharmacotherapies; long-term use of pharmacotherapies to prevent relapse to smoking; use of nicotine replacement therapy in pregnancy; long-term use of nicotine replacement therapy or other pharmacotherapies as a harm reduction strategy to reduce the amount smoked; interventions for adolescent smokers; improving access to effective interventions; organization of healthcare systems for the delivery of appropriate interventions; optimal sequence of treatments and treatment combinations for repeated attempts to quit; and treatment of smokers with co-morbidities (psychiatric illness, other chemical dependencies) (SRNT-WHO 2003).

## Behavioural support

As the intensity of behavioural support is important, three types can be described: (a) one-off advice, with or without pharmacological support; (b) brief supportive intervention, with or without pharmacological support; and (c) intensive intervention, with or without pharmacological support.

### One-off and brief supportive interventions

One off advice given by a general practitioner (GP) and supported by written material is effective, OR<sup>1</sup>: 1.27 (95% CI: 1.11-1.45), equivalent to an absolute difference between intervention and control groups of 2.1%; and advice with than one contact (brief supportive intervention) is also effective, OR: 1.96 (95% CI: 1.18-1.80), equivalent to an absolute difference of 4.4% (Ashenden et al 1997), see Table 5.1.

Another meta-analysis found that advice given by a physician is effective: OR: 1.3 (95% CI: 1.1-1.6), equivalent to an absolute difference of 2.3%. (95% CI: 0.6-4.1) (Fiore et al 2000), Table 5.2. A review of studies which mostly took place in primary healthcare found that one-off advice or a brief supportive intervention were effective,

<sup>1</sup> The odds ratio (OR) is the odds of an event in an intervention group divided by the odds of an event in a non-intervention group, where the odds is the ratio of the probability of the occurrence of an event to that of non-occurrence.

	Treatment	No treatment
Quit	a	b
Does not quit	c	d

The effect of treatment odds ratio is the ratio of odds in favour of treatment amongst the group that quits (a/b) to the odds in favour of treatment for those that do not quit (c/d). This can be calculated as ad/bc.

OR: 1.69 (95% CI: 1.45-1.98) equivalent to an absolute difference of 2.5%. Finally, intensive interventions were also effective, OR: 2.11 (95% CI: 1.74-2.54) (Silagy & Stead 2003), see Table 5.1.

**Table 5.1** Effectiveness of one-off, brief supportive interventions

Author	Level of evidence	Year	Therapy	No. patients	Duration therapy and follow-up	OR (95% CI)	Measure of effectiveness
Ashenden 1997	A1	1972-1995	Advice*	14,047 in 16 RCTs	One-off contact, $\geq 6$ months	1.27 (1.11-1.45)	Strictest criterion***
Ashenden 1997	A1	1984-1994	Advice*	17,233 in 6 RCTs	More than 1 contact, $\geq 9$ months	1.46 (1.18-1.80)	Strictest criterion***
Silagy 2002	A1	1972-1997	Advice*	13,575 in 16 RCTs	Maximum 2 contacts with first contact $< 20$ min and no educational methods other than a leaflet, $\geq 6$ months	1.69 (1.45-1.98)	Strictest criterion***
Silagy 2002	A2 (heterogeneous)	1984-1995	Advice*	5325 in 5 RCTs	First contact $> 20$ min, $> 2$ contacts, or educational methods other than leaflet, $\geq 12$ months	2.11 (1.74-2.54)	Strictest criterion***
Pieterse 2001	A2	2001	MIS**	530 and 22 GPs	1-2 contacts, 12 months	3.04 (1.7-5.6)	Continuous abstinence, self-reporting

\* Versus no intervention or usual care.

\*\* Versus usual care.

\*\*\* For each RCT the strictest outcome measure used in the study concerned was adopted; this was at the very least the point prevalence of self-reported abstinence after 6 months.

**Table 5.2** Effectiveness of one-off, brief supportive interventions (Fiore et al 2000)<sup>1</sup> (= 5 months follow-up; preferably 1-week point prevalence)

Advice	No. arms in study (7 studies)	Estimate OR (95% CI)	Estimate abstinence ratio (95% CI)
No advice to stop (reference group)	9	1.0	7.9
Advice from physician to stop	10	1.3 (1.1-1.6)	10.2 (8.5-12.0)

### **Type of intervention**

Motivational counselling has been found not to be significantly more effective than brief advice, OR: 2.00 (95% CI: 0.59-6.72), see Table 5.3. However, a small positive effect of follow-up was reported for a minimum intervention (Silagy & Stead 2003). A health professional offering personal supervision (OR: 1.3 (95% CI: 1.1-1.6)), discussion and resolving of barriers (OR: 1.5 (95% CI: 1.3-1.8)) and giving an advice to gain support from the social network (OR: 1.5 (95% CI 1.1-2.1)), are effective (Fiore et al 2000). Adding an intervention to increase the support from a partner has no extra effect compared to interventions without this extra intervention (Park et al

2002). There is limited evidence that stage-based interventions are more effective than other interventions or the usual provision of care (Riemsma et al 2003).

**Table 5.3** Effect of the type of intervention

Author	Level of evidence	Year	Therapy	No. patients	Duration therapy and follow-up	OR (95% CI)	Measure of effectiveness
Silagy 2003	B (1 study)	1999	Consultation focussed on motivation self-versus reporting brief advice	536	One or more contacts, $\geq 6$ months	2.00 (0.59–6.72)	Point-prevalence abstinence,
Park 2002	A1	1981-1992	Intervention plus partner-support -versus intervention	1757 in 9 RCTs	Variable, $\geq 6$ months	1.08 (0.81-1.44)	Point prevalence abstinence, self reporting
Riemsma 2003	A1 (review)	1991-2002	Stage-based versus non-stage based or none	23 RCTs	-	-	-

### ***Duration and intensity***

Although a direct comparison found no added benefit of brief supportive intervention over one-off advice (OR, 1.07 (95% CI: 0.88-1.29) (Ashenden et al 1997), a meta-analysis found that the effectiveness of interventions increases if the intervention is more intensive, lasts longer or contains more points of contact (Fiore et al 2000), see Tables 5.4 to 5.6. Intensive interventions are found to be more effective than one-off advice or a brief supportive intervention, OR, 1.44 (95% CI: 1.23-1.68). Adding follow-up consultations is more effective than no follow-up, OR 1.60 (95% CI: 1.10-2.33) (Silagy & Stead 2003), see Table 5.7. Adding a telephone follow-up to a face-to-face intervention has no additional effect, OR 1.08 (95% CI: 0.87-1.34) (Stead et al 2003).

**Table 5.4** Intensity of the intervention (Fiore et al 2000) (= 5 months follow-up; preferably 1-week point)

Level of (intensity of) contact	No. arms in study (43 studies)	Estimate OR (95% CI)	Estimate abstinence ratio (95% CI)
No contact	30	1.0	10.9
Minimal counselling (< 3 minutes)	19	1.3 (1.01-1.6)	13.4 (10.9-16.1)
Low intensity of counselling (3-10 minutes)	16	1.6 (1.2-2.0)	16.0 (12.8-19.2)
Higher intensity of counselling (> 10 minutes)	55	2.3 (2.0-2.7)	22.1 (19.4-24.7)

**Table 5.5** Duration of the intervention (Fiore et al 2000)

Level of (intensity of) contact	No. arms in study (35 studies)	Estimate OR (95% CI)	Estimate abstinence ratio (95% CI)
Less than one minute	16	1.0	11.0
1-3 minutes	12	1.4 (1.1-1.8)	14.4 (11.3-17.5)
4-30 minutes	20	1.9 (1.5-2.3)	18.8 (15.6-22.0)
31-90 minutes	16	3.0 (2.3-3.8)	26.5 (21.5-31.4)
91-300 minutes	16	3.2 (2.3-4.6)	28.4 (21.3-35.5)

**Table 5.6** Number of sessions of the intervention (Fiore et al 2000)

Number of sessions	No. arms in study	Estimate OR (95% CI)	Estimate abstinence ratio (95% CI)
0-1 sessions	43	1.0	12.4
2-3 sessions	17	1.4 (1.1-1.7)	16.3 (13.7-19.0)
4-8 sessions	23	1.9 (1.6-2.2)	20.9 (18.1-23.6)
> 8 sessions	51	2.3 (2.1-3.0)	24.7 (21.0-28.4)

**Table 5.7** Duration and intensity of the intervention

Author	Level of evidence	Year	Therapy	No. patients	Duration therapy and follow-up	OR (95% CI)	Measure of effectiveness
Ashenden 1997	A1	1982-1993	Brief versus one-off advice contact	6275 in 7 RCTs	More than 1 contact versus one-off contact $\geq 9$ months	1.07 (0.88-1.29)	Strictest criterion*
Silagy 2002	A2 (heterogeneous)	1982-2000	Intensive versus brief advice	9775 in 14 RCTs	For brief advice max. 2 contacts with initial contact < 20 min and no educational methods other than a leaflet, $\geq 6$ months	1.44 (1.23-1.68)	Strictest criterion*
Silagy 2002	A1	1982-1991	Advice and follow-up-visit versus one-off advice	1254 in 5 RCTs	Several contacts versus 1 contact, $\geq 6$ months	1.60 (1.10-2.33)	Strictest criterion*
Stead 2002	A1	1991-1999	Advice and telephone follow-up versus advice	2078 in 4 RCTs	Varied per RCT, $\geq 6$ months	1.08 (0.87-1.34)	Strictest criterion*

\* For each RCT the strictest outcome measure used in the study concerned was adopted; this was at the very least the point prevalence of self-reported abstinence after 6 months.

**Self-help materials**

Adding resources to advice, such as a video, self-help guide, or a telephone card, OR 1.95 (95% CI: 1.54-2.45), is not clearly more effective than an advice without a resource, OR 1.88 (95% CI: 1.63-2.18), see Table 5.8. Adding a telephone follow-up to a face-to-face intervention has no additional effect: OR 0.97 (95% CI: 0.78-1.21) (Lancaster & Stead 2003). In another meta-analysis the addition of self-help materials to face-to-face advice was found to have a minimal effect (Fiore et al 2000), Table 5.9.

**Table 5.8** Effectiveness of adding self-help materials

Author	Level of evidence	Year	Therapy	No. patients	Duration therapy and follow-up	OR (95% CI)	Measure of effectiveness
Silagy 2002	A2 (heterogeneous)	1978-1997	Advice without resource*	14053 in	1 to more 16 RCTs ≥ 6 months	1.95 (1.54-2.45)	Strictest criterion**
Silagy 2002	A2 (heterogeneous)	1986-1995	Advice with resource*	4290 in	1 to more 5 RCTs ≥ 6 months	1.88 (1.63-2.18)	Strictest criterion**
Silagy 2002	B (1 study)	1999	Advice and spirometry and CO level	536	1 or more contacts, ≥ 6 months	0.61 (0.26-1.14)	Point-prevalence, self-reporting
Lancaster 2002	A1	1983-1998	Advice and self-help material versus advice	5309 in 11 RCTs	Mostly one-off contact, ≥ 6 months	0.97 (0.78-1.21)	Strictest criterion**

\* Versus no intervention or usual care.

\*\* For each RCT the strictest outcome measure used in the study concerned was adopted; this was at the very least the point prevalence of self-reported abstinence after 6 months.

**Table 5.9** Effectiveness of adding self-help materials (Fiore et al 2000) (= 5 months follow-up; preferably 1-week point prevalence)

Form	No. arms in study (58 studies)	Estimate OR (95% CI)	Estimate abstinence ratio (95% CI)
No form	20	1.0	10.8
Self-help	93	1.2 (1.02-1.3)*	12.3 (10.9-13.6)

\* Similar outcome for studies in which self-help methods (considerable range of methods) formed the only difference between the arms. Addition of a self-help guide to individual counselling was not effective (Fiore et al 2000, p. 51).<sup>1</sup>

**Characteristics of the smoker**

A direct comparison between intensive as opposed to one-off advice or a brief supportive intervention gave an OR of 1.23 (95% CI: 1.02-1.49) for unselected smokers and 1.82 (95% CI: 1.44-2.29) for smokers with a high risk of smoking-related complaints (Silagy & Stead 2003).

A meta-analysis of different forms and intensities of treatment found that the effect of treatment is not dependent on whether the smoker requests treatment or the treatment is offered without being requested. Gender, race and ethnicity were also found to have no effect. Treatment of the elderly was also found to be effective (Fiore et al 2000). Some of the variables associated with abstinence rates are summarized in Table 5.10.

**Table 5.10** Variables associated with abstinence rates (Fiore et al 2000)

Variables which are associated with high abstinence rates	
Variable	Example
High motivation	Smoker indicates motivation to stop
Ready for change	Smoker is ready to stop within one month
Average to high self-efficacy	Smoker has confidence in his/her attempt to stop
Supportive social network	A smoke-free environment at work and at home; friends who do not smoke in the presence of the smoker who has stopped
Variables associated with lower abstinence rates	
Strong nicotine dependence	Smoker experienced serious withdrawal symptoms during previous attempt to stop, smokes a lot (> 20 cigarettes/day), and/or smokes his/her first cigarette of the day within 30 minutes of waking up
Psychiatric history	Smoker has a history of depression, schizophrenia, alcoholism, or other chemical dependence
High stress level	Stressful circumstances and/or recent large changes in everyday life (for example divorce, new job, moved house)

Interventions for smoking cessation among pregnant women are effective: OR: 1.9 (95% CI: 1.7-2.1), equivalent to an absolute difference of 6.4%. (Lumley et al 2003). For interventions with a very high intensity the OR was 1.9 (95% CI: 1.6-2.2), equivalent to an absolute difference of 7.9%. Another meta-analysis also revealed that extra attention for smoking cessation among pregnant women was more effective than usual care: OR: 2.8 (95% CI: 2.2-3.7) (Fiore et al 2000), Table 5.11.

**Table 5.11** Interventions for pregnant women (Fiore et al 2000)<sup>1</sup>

Pregnant smokers	No. arms in study	Estimate OR (95% CI)	Estimate abstinence ratio (95% CI)
Usual care (advice to stop often given in combination with self-help materials or referral)	7	1.0	6.6
Intervention with more than the usual components	8	2.8 (2.2-3.7)	16.8 (13.1-20.5)

### 5.1.2 Intensive interventions

Intensive interventions can be described as at least four sessions, each of which lasts at least 10 minutes. More intensive interventions for smoking cessation are more effective than less intensive interventions. The effect of more intensive interventions is 1.4 times greater than less intensive interventions, and 1.6 times greater if there is at least one follow-up (Silagy & Stead 2003), see Table 5.12.

#### **Motivation**

Behavioural interventions are frequently based on the transtheoretical model, which is also called the 'stages of change' model (Prochaska & DiClemente 1993). This model distinguishes five motivational stages in the cessation process: pre-contemplation, contemplation, preparation, action and maintenance. Interventions are based on the idea that it is more effective to tailor the intervention to the motivational stage of the quitter than to use a 'general' intervention. A review of 23 randomised clinical trials found that there was limited evidence for the added value of motivational stage-specific interventions on the effectiveness of smoking cessation (Riemsma et al 2003).



**Table 5.12** Intensity of the intervention

Author	Level	Year	Therapy	No. patients	Duration therapy and follow-up	OR (95% CI)	Measure of effectiveness
Silagy 2002	A1	1982-1992	Intensive versus one-off or brief advice	6002 un-selected smokers in 10 RCTs	1 or more contacts, ≥ 6 months	1.23 (1.02-1.49)	Strictest criterion*
Silagy 2002	A1	1974-1990	Intensive versus one-off or brief advice	3773 high-risk-smokers in 5 RCTs	1 or more contacts, ≥ 6 months	1.82 (1.44-2.29)	Strictest criterion*
Senore 1998	C (regression analysis)	1998	Various types of interventions	861 in intervention group	Several contacts, 12 months	0.19 (0.07-0.52)	Continuous abstinence, for previous biochemically validated versus no previous advice
Pieterse 2001	C (regression analysis)	2001	MIS	530 and 22 GPs	1-2 contacts, 12 months for high versus low nicotine dependence	1.39 (1.2-1.7)	Continuous abstinence, self-reported
Lumley 2003	A2 (heterogeneous)	1976-1998	Various types of interventions versus usual care and sometimes biochemically validated care	9945 in 34 RCTs	1 or more contacts, until third trimester	0.53 (0.47-0.60)	Continue smoking; self-reported
Lumley 2003	A2 (heterogeneous)	1984-1998	Very intensive interventions versus usual care and sometimes biochemically validated cares	4028 in 13 RCTs	Several contacts, until third trimester	0.54 (0.46-0.63)	Continue smoking; self-reported

\* For each RCT the strictest outcome measure used in the study concerned was adopted; this was at the very least the point prevalence of self-reported abstinence after 6 months.

### ***Degree of addiction***

The American guideline states that there is no evidence for the differential effectiveness of intensive treatment for subpopulations, such as strongly dependent smokers (Cromwell et al 1997).

### **5.1.3 Influence of method, form and size on the effectiveness of intensive interventions**

#### ***Method***

There is some evidence that programmes which focus on increasing social skills (important elements of relapse prevention) are more effective than programmes without these components (Stead & Lancaster 2003). With the exception of social support and skills training, there is no evidence that a specific component will contribute to the effectiveness of interventions (Stead & Lancaster 2003). A meta-analysis into the effectiveness of interventions for different types of counselling and behavioural support found that effective interventions consist of: a) practical counselling (focused on problem-solving skills/skills training), b) social support, and c) helping quitters to obtain social support (Fiore et al 2000). Studies into the effect of combined interventions consisting of interventions and exercise programmes found that there is not yet enough evidence to demonstrate that this affects behaviour



during smoking cessation (Ussher et al 2003). Behavioural interventions supported by a partner, friend or another person of influence have no effect on the percentage of smokers who stop smoking (Park et al 2003).

The effectiveness of hypnotherapy, rapid smoking and other aversion methods, acupuncture, acupressure, laser therapy or electrostimulation for smoking cessation is still unknown (Abbot et al 2003; Hajek et al 2003; Willemsen et al 2003).

### **Form**

Group interventions offer smokers the possibility of learning behavioural techniques for smoking cessation. Group interventions are more effective than self-help programmes or less intensive individual interventions. In terms of effectiveness, behavioural therapy group programmes are comparable with individual support of the same intensity: after 12 months 16%-48% of participants have stopped smoking (Stead & Lancaster 2003). As group therapy is often studied in combination with nicotine replacement therapies it is difficult to indicate the precise effect of the programme. It has not yet been demonstrated which components of group training work better than others (for example, skills training or strengthening motivation).

### **Size: number and duration of sessions**

For behavioural support there is a strong dose-response relationship between the duration and number of the sessions and the success rate (Fiore et al 2000; Alterman et al 2001).

The American guideline found that behavioural support had a strong dose-response relationship with the total contact time and the abstinence rate. A contact time of 31-90 minutes leads to an abstinence rate which is significantly higher than 1-30 minutes. However, a total contact time of 90 minutes or longer did not lead to a further increase in the abstinence rate than a contact time of 31-90 minutes (Fiore et al 2000).

The American guideline also states that treatments of more than 10 minutes are more effective than less intensive treatments (Fiore et al 2000). The English guideline also found a dose-response relationship between the intensity of support and the number of quitters (Parrott et al 1998). In the Cochrane review of Silagy this dose-response relationship is less strongly present. In this review, intensive interventions are only marginally more effective than less intensive interventions (Silagy & Stead 2003). Less intensive intervention is defined here as less than 20 minutes and one follow-up visit; the intensive intervention has a contact time of more than 20 minutes and more than one follow-up visit. Follow-up visits and no follow-up visits compared to no advice resulted in ORs of respectively 2.66 (95% CI: 2.06-3.45) and 1.59 (95% CI: 1.33-1.90). In the study of Gilbert, the addition of a follow-up visit to the less intensive intervention strategy led to a small increase in the number of quitters (OR: 1.60; 95% CI: 1.20-2.33) (Gilbert et al 1992). After biochemical validation there was no significant difference between 2 or 4 follow-up visits (Silagy & Stead 2003). The study of Miller et al (1997) describes an intervention in the hospital followed by either one or four follow-up phone calls. The more intensive interventions increased continuous abstinence from 14% to 19% compared to the less intensive intervention. This difference was just statistically significant (Stead & Lancaster 2003). According to the English guidelines a smoking cessation treatment must consist of at least five sessions of about one hour (Parrot et al 1998). The American guidelines indicate that an intensive treatment must contain at least four sessions of 10 minutes.

### ***'Stepped care' range of interventions***

According to the American guideline and a review from Riemsma et al., stepped-care approaches do not result in significantly higher abstinence figures among smokers than a non-stepped-care approach (Fiore et al 2000; Riemsma et al 2003).

## **5.2 Pharmacological support**

### ***5.2.1 Nicotine replacement therapies***

All nicotine replacement therapies are an effective aid for smoking cessation (Silagy et al 2003). If the separate data for the different nicotine replacement therapies are pooled then 17% of smokers were found to have stopped for a period of more than one year, as opposed to 10% in the control group. This is equivalent to an OR of 1.7 (95% CI 1.6-1.9). The NNT of nicotine replacement therapies at 12 months (sometimes 6 months) follow-up is about 6 (the NNT of placebo is about 10). That means that for each quitter, 6 or 10 patients respectively need to be treated. The NNT of nicotine replacement therapies minus the placebo effect (the added value of nicotine replacement therapies) is about 14. A form of psychological support or behavioural therapy was given in virtually all of these studies in the Cochrane review. Therefore without this additional support the cessation rates could be lower.

Very few comparative studies have been carried out to estimate the differences in effectiveness between the various nicotine replacement therapies. In Table 5.13, the percentage of smokers who had still stopped after a year, is given per type of nicotine replacement therapy (Silagy et al 2003).

**Table 5.13** Overview of cessation rates and NNT for the various nicotine replacement therapies

Nicotine replacement therapy	% stopping after 1 year (95% CI)	OR (95%-BI)	NNT**
Gum	18 (17-19)	1.7 (1.5-1.8)	6
Transdermal patch	14 (13-15)	1.8 (1.6-1.9)	7
Nasal spray	24 (20-28)	2.3 (1.6-3.2)	4
Inhaler	17 (14-21)	2.1 (1.4-3.0)	6
Sublingual tablet	20 (15-25)	1.7 (1.0-2.8)	5

\*\* Number of persons that need to be treated for one person to stop.

It cannot be concluded from Table 5.13 that one form of nicotine replacement therapy is more effective than another, even though the nasal spray and the inhaler seem to be more effective (Silagy et al 2003). For people who are strongly nicotine dependent, a higher dose of nicotine gum (4 mg) is more effective than a lower dose (2 mg) (OR: 2.7; 95% CI: 1.7-4.2). If the results are not stratified for nicotine dependence, this difference in effect between the two doses is not found (Silagy et al 2003). Pooled data indicate that a patch with a higher dose is slightly more effective than one with a lower dose (OR: 1.2; 95% CI: 1.03-1.4) (Silagy et al 2003). There is no difference in effectiveness between a 16-hour and a 24-hour patch (Silagy et al 2003).

There is insufficient evidence that combinations of different nicotine replacement therapies increase cessation rates. The available studies are heterogeneous. Although some combinations of nicotine replacement therapies possibly increase the effect, other combinations do not (Silagy et al 2003). However, it seems safe to combine different forms of nicotine replacement therapies (McNeill et al 2001).

Compared to non-intensive supervision, intensive supervision does not ensure a significant increase in the effect of nicotine replacement therapies, although there is a trend in favour of intensive supervision (Silagy et al 2003). The effect of nicotine replacement therapies is not enhanced when combined with group therapy (Silagy et al 2003).

There is not enough evidence to demonstrate the effect of nicotine replacement therapies among people who smoke less than 10-15 cigarettes per day. For all categories of smokers who smoke more than 15 cigarettes a day, nicotine replacement therapies have proven their effectiveness. The effectiveness is lower among people who have been admitted to hospital, because their motivation is often insufficient (Silagy et al 2003). Nicotine gum and nicotine patches are more effective among volunteers who respond to a selection advertisement than among smokers who are recruited by health professionals (Silagy et al 2003). In so far as it has been investigated, there is no observable difference in effect between smokers from different socio-economic groups (Silagy et al 2003). Furthermore, the scientific literature does not offer support for recommending specific nicotine replacement therapies to certain smokers (Silagy et al 2003).

### **5.2.2 Bupropion**

The Cochrane review of Hughes et al. found that bupropion sustained release (SR) is an effective drug for helping motivated smokers during an attempt to stop (Hughes et al 2003). Taken together, the results of 10 studies with 12 months of abstinence data and six studies with 6 months of abstinence data, resulted in an OR of 2.0 (95% CI: 1.7-2.3). After 12 months follow-up the NNT was 11 (95% CI: 9-14). In all of the studies included, the treatment with bupropion was combined with an intensive behavioural intervention.

Up until 2003, one controlled study had been carried out into the effect of bupropion SR as an aid for smoking cessation in patients with COPD (Tashkin et al 2001). The results after 26 weeks suggest that bupropion SR is an effective product for smoking cessation in this group. However, the results after 12 months no longer found any significant difference between the experimental group and the control group (OR: 1.2; 95% CI: 0.6-2.4; NNT 15; 95% CI: 7.7-321) (Hughes et al 2003; Tashkin et al 2001; Wagena et al 2003).

Up until now one controlled study has been carried out into the effect of bupropion SR (300 mg over a period of 7 weeks) as an aid for smoking cessation in patients with a cardiovascular condition (Tonstad et al 2003). After both 6 and 12 months, bupropion SR was found to be more effective than placebo (continuous abstinence at 6 months: OR 3.1; 95% CI: 2.0-5.0 versus 12 months: OR 2.8; 95% CI: 1.7-4.6; NNT at 52 weeks, 8; 95% CI: 5.5-14.5).

For schizophrenia two randomised, placebo-controlled studies have been carried out (George et al 2002; Evins et al 2001). One study was carried out with a prior and follow-up measurement, without a control group (Weiner et al 2001). In one study the participants in the experimental group received bupropion SR 300 mg over a period of 10 weeks combined with group therapy (weekly for 10 weeks, 60 minutes per session) (George 2002). The use of antipsychotics in addition to the study medication was continued during the study at the same dosage. The point prevalence of abstinence after 10 weeks was 50% in the bupropion group (8/16) and 13% in the placebo group (2/16); after 6 months this was 19% (3/16) and 6% (1/16) respectively. In one study the participants in the experimental group received bupropion SR 150 mg over a period of 12 weeks and weekly cognitive behavioural therapy in groups for a period of 9 weeks (60 minutes per session). In this study the

experimental medication was also added to the maintenance medication. After 6 months one participant from the experimental group (11%) was found to be abstinent and no participants from the control group (0%) were found to be abstinent.

One study has been carried out into the effectiveness of bupropion (300 mg over a period of 9 weeks, starting 1 week prior to the planned stop day) compared to a nicotine replacement therapy product (in this case nicotine patches; 21 mg over a period of 6 weeks, after which this was withdrawn over a period of 2 weeks) (Jorenby et al 1999). Furthermore, all of the participants underwent an intensive behavioural support programme. Bupropion SR was found to be more effective than nicotine patches (OR: 2.1; 95% CI 1.2-3.5; NNT 12 months 7 (95% CI: 4.7-15.3).

Two studies have been carried out into the effectiveness of bupropion SR combined with nicotine replacement therapies (Jorenby et al 1999; Simon et al 2002). In the first study bupropion SR 300 mg (9 weeks) was combined with nicotine patches (21 mg over 6 weeks) (Jorenby et al 1999). This combination was found to be more effective than the use of nicotine patches only (OR: 2.7; 95% CI: 1.6-4.5). In the second study bupropion (300 mg, 7 weeks) was also combined with nicotine patches (2 months, dosage unknown) (Simon et al 2002). No difference in effectiveness was found in this study (OR: 0.8; 95% CI: 0.3-1.4). As these studies were heterogeneous (including, for example, the intervention) no pooled results have been calculated.

In one study the effectiveness of bupropion in combination with an intensive and less intensive behavioural treatment was investigated (Hall et al 2002a). The most intensive treatment consisted of bupropion SR over a period of 12 weeks combined with four individual sessions varying from 5 to 20 minutes, five group sessions of 90 minutes and a self-help guide. The less intensive intervention consisted of bupropion SR over a period of 12 weeks combined with just the individual sessions (four of 5 to 20 minutes). The following point prevalence figures were found in weeks 24 and 52. The first intervention led to 27% (10/37) and 24% (9/37) stopped participants and the second to 22% (8/36) and 25% (9/36) respectively.

### ***Nortriptyline***

The Cochrane review found that nortriptyline is an effective aid for helping smokers during an attempt to stop (Hughes et al 2003a). Combining the separate results from four studies with at least 6 months of abstinence data, results in an OR of 2.8 (95% CI 1.7-4.6) and an NNT of 10, (95% CI: 7-18).

In one study the effectiveness of nortriptyline combined with nicotine patches was investigated. Nortriptyline 75 mg/day over a period of 12 weeks was combined with nicotine patches over a period of 8 weeks (dosage not known). This combination was found to be more effective than the use placebo-nortriptyline and nicotine patches (6 months abstinence: OR: 2.8; 95% CI: 1.2-6.9; NNT 7.2; 95% CI: 4-42) (Prochazka et al 2001).

There are two studies in which the effectiveness of nortriptyline combined with intensive behavioural support has been compared with nortriptyline combined with less intensive support. In the first study the most intensive treatment consisted of nortriptyline (dose was titrated; length of treatment 12 weeks) combined with 10 sessions of 2 hours with 5-11 participants over a period of 8 weeks (Hall et al 1998). The less intensive intervention consisted of nortriptyline (12 weeks) combined with five sessions of 90 minutes, also with 5-11 participants over a period of 8 weeks. The point prevalence figures in weeks 24 and 65 were 47% (24/51) versus 38% (18/48), and after 64 weeks 31% (16/51) versus 31% (15/48).

In the second study one group received nortriptyline combined with five individual sessions of 10-20 minutes conducted by a specialist (in weeks 1, 2, 5, 6 and 11) (Hall et al 2002). The second group received nortriptyline with 5 individual sessions and 5 sessions of 90 minutes conducted by a trained counsellor (in the same period). After 24 weeks the most intensive intervention seemed to be the most effective (26% (9/35) versus 18% (7/38)), after 52 weeks this difference had disappeared (17% (6/35) versus 18% (7/38)). However, the results should be interpreted with some caution, as these are not abstinence figures over a given period (for example, continuous abstinence or prolonged abstinence).

In one study nortriptyline as an aid for smoking cessation was compared with bupropion (Hall et al 2002). This study found that after 24 and 52 weeks there was no significant difference between the two (point prevalence after 24 weeks 22% abstinence in the nortriptyline group (16/73) and 25% (18/73) in the bupropion group; point prevalence after 52 weeks 18% abstinence in the nortriptyline group (13/73) and 25% abstinence in the bupropion group (18/73)).

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## 6. COSTS AND COST EFFECTIVENESS OF SMOKING CESSATION INTERVENTIONS

### Summary of chapter evidence

**Smoking cessation support is cost effective** The treatment of tobacco dependence is one of the most cost-effective treatments provided by the health care system. Treatment provided by general practitioners can result in immediate savings.

### Recommendations

**The treatment of tobacco dependence** represents an extremely efficient use of financial resources that leads to better health and financial gains both in the short term and the long term. Financial resources within the health care sector should be devoted more specifically to the treatment of tobacco dependence.

The costs of smoking cessation interventions are low in comparison with the benefits in terms of prevention, mortality, morbidity and treatment costs for smoking-related diseases. International reviews suggest that the costs per year of life gained vary between €215 and €6200 (World Bank 1999). The majority of the studies give cost-effectiveness ratios of less than €2500 per year of life gained. This is likely to be an overestimate in cost, since these studies generally do not include the savings from preventing smoking-related diseases. For preventive interventions such as smoking cessation it is often stated that a cost effectiveness ratio below €20,000 per year of life gained is cost-effective. Compared with this amount, interventions aimed at smoking cessation are extremely cost-effective.

In the Netherlands, the cost-effectiveness of five smoking cessation interventions compared to the current practice was calculated, assuming that these five interventions would be implemented over a period of one year and that 25% of the smokers would be reached (Feenstra et al 2003). The calculations were made using a simulation model in which a time horizon of 75 years was adopted, with 2000 as the baseline year, and a discounting of 4% per year of both costs and effects. The interventions considered were:

1. Brief intervention (BI) given by the general practitioner or practice assistant in one or two consultations with a total duration of 12 minutes.
2. BI, as described above, including nicotine replacement therapies for a period of 8 weeks.
3. Intensive counselling (IC) by a trained counsellor given over a period of 12 weeks, with a total duration of 90 minutes, and including nicotine replacement therapies.
4. IC, as described above, including bupropion for a period of 9 weeks.
5. Telephone counselling (TC), consisting of one initial consultation of 30 minutes and six subsequent appointments of 15 minutes, each based on the content of an electronic questionnaire completed by the quitter.

For the different methods, the figures after 12 months of continuous abstinence with a 95 percent confidence interval were used as given in Table 6.1.

**Table 6.1 Abstinence after 12 months for various methods**

Intervention	Abstinence (in %:95% CI)
Usual practice	3.4
BI	7.9 (4.7-11.1)
BI + NRT	12.7 (11.9-13.5)
IC + NRT	15.1 (14.1-16.1)
IC + bupropion	17.2 (14.0-20.4)
TC	7.6 (6.9-8.3)

Calculations were made on the basis of the assumption that in the year 2000, 25% of all smokers would have made use of one of the interventions. The estimates contain cost-savings for the non-treatment of eleven smoking-related diseases: acute myocardial infarct, coronary heart disease, stroke, COPD, lung cancer, throat cancer, oral cancer, oesophagus cancer, pancreatic cancer, bladder cancer and kidney cancer. The intervention costs per smoker were estimated to be €21 for minimal counselling by the general practitioner (BI), €163 for minimal counselling by the general practitioner with nicotine replacement therapy, €349 for intensive counselling with nicotine replacement therapy, €334 for intensive counselling with bupropion and €70 for telephone counselling according to need. The extra costs per additional quitter varied from € 440 for minimal counselling by the general practitioner to €2800 for intensive counselling with nicotine replacement therapy. Minimal counselling in general practice, over a period of one year, in which 25% of smokers were reached, was found to lead to cost-savings. In other words the estimated cost-savings for not having to treat the 11 smoking-related diseases (€57 million) were greater than the costs of intervention (€23 million). For every €10 spent on minimal counselling in general practice, €25 would be saved in healthcare costs (Table 6.2).

**Table 6.2** Basic estimates of the number of years of life gained (LYs), for quality corrected years of life (QALYs), total extra intervention costs, total care savings and cost-effectiveness: Costs per extra year of life gained and costs per extra gained, 4% discount in both costs and effects (based on Euro in 2000)

Intervention	Gain LYs* x 10,000	Gain QALY** x 10,000	Intervention costs x 1,000,000	Cost savings for treating diseases x 1,000,000	Costs per LY gained	Costs per QALY gained
BI	1.4	1.7	23	57	†	†
BI + NRT	2.8	3.6	180	120	2300	1700
IC + NRT	3.5	4.5	390	150	6800	5200
IC + bupropion	4.1	5.3	370	170	4700	3600
TC	1.2	1.6	77	53	2000	1500

† Minimal counselling by the general practitioner was not only more effective than the current practice, but also cheaper.

The costs per quality adjusted life year (QALY) for the other interventions were €1700 for BI + nicotine replacement therapy, €5200 for IC + nicotine replacement therapy, €3600 for IC + bupropion, and €1500 for TC. The costs per QALY were lower, the higher the age of the participants in the interventions.

In reality the interventions are possibly even more cost-effective, as the effects of smoking cessation on the progression of diseases, the effects of passive smoking, and the effects of smoking during pregnancy on babies were not included. Furthermore, only the medical costs were included, and not the productivity costs.

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## 7. PROVIDING HEALTH CARE INFRASTRUCTURE

### Summary of chapter evidence

**Required infrastructures for effective services for smoking cessation** Five domains are required for an effective service for smoking cessation: organization of health care, support for providing treatment, availability of effective treatments, provision of effective treatment by health care providers and uptake of effective treatment by health care users.

### Recommendations

**An integrated strategy** needs to be provided for the treatment of tobacco dependence.

**The costs of treatment** of tobacco dependence should be fully reimbursed to providers and users.

**A comprehensive evaluation** and reporting system for services for the treatment of tobacco dependence should be developed and implemented.

**An integrated health care system** includes effective communication and a seamless flow of care between primary care, secondary care and specialist services (West et al 2000; Saltman & Fugueras 1997; Raw et al 2001a, 2001b). The availability of specialist support and referral systems increases the uptake of effective treatment (Bauld et al 2003; Department of Health 2003). Health care services and organizations require a clear policy for the infrastructure needed for tobacco treatment services (Bentz 2000).

**Structures for quality of care** include structures and organizations that have responsibility for undergraduate education of health care providers, licensing of health care providers, specialist education and continuing medical education, quality of provision of care, monitoring of health outcomes, clinical negligence, licensing of medications, safety of medicines and cost effectiveness of health care interventions (Gray 2001).

**Undergraduate programmes** should include examinable education on tobacco dependence and its treatment, ensuring that licensed providers have been adequately trained. **Specialist education and continuing medical education** impart knowledge and skills and change providers' behaviour (Davis et al 1995).

**Education and training** applies to undergraduate education, vocational and specialist training, and continuing education of primary and secondary health care professionals and those in specialist services. Trained providers lead to more effective treatment and an increased number of successful quit attempts (Anderson & Llopis 2004). Training appears to be more effective when coupled with systems changes (Fiore et al 2000). All primary health care and hospital based physicians and nurses, including pharmacists and dentists should receive sufficient practical and theoretical training to enable them to deliver opportunistic advice to encourage a cessation attempt and to offer accurate advice on pharmacotherapy (West et al 2000; World Health Organization 2003). Specialist clinics and other support services should

be staffed by individuals specially trained and employed for the purpose (West et al 2000). Core syllabi and national accreditation for training for brief interventions and for those delivering the specialist services should be established to ensure a minimum standard (West et al 2000). Health care systems should support training, ensure health professionals have access to such training and support them in continuing to use their new skills (Raw et al 1998; World Health Organization 2003).

**Guidelines and quality standards** define clinical practice and provide the basis for which effective treatment can be monitored (West et al 2000; Fiore et al 2000; Kwaliteitsinstituut voor de Gezondheidszorg 2003; Grimshaw & Russell 1993). Guidelines and protocols that are adhered to lead to more effective treatment (AGREE 2000; Grol & Grimshaw 2003). Thus, guidelines and protocols for the treatment of tobacco dependence that call on all health care providers to advise every patient who smokes to quit supported by pharmacotherapy (World Health Organization 2000; Fiore et al 2000; Bjornson 2000) need to be available. Organizational screening, follow-up and audit systems lead to more effective treatment and successful quit attempts (Anderson & Jane-Llopis 2004). Within all health care services, the smoking status of all patients and the offered and used treatments should be documented (West et al 2000; Fiore et al 2000). Clinical practice should be measured and audited against set standards or guidelines (Bentz 2000).

**Institutes for Clinical Excellence** can provide healthcare providers and users with authoritative, robust and reliable guidance on current best practice (National Institute for Clinical Excellence 2002). Failure to adhere to clinical standards can result in **litigation** for clinical negligence (Hurwitz 1998). Medications for the treatment of tobacco dependence require **licensing**, with ongoing reviews of their indications for use (McNeill et al 2001) and safety (Committee on Safety of Medicines 2002) should be regularly analyzed, updated and reported (Novotny et al 2000).

**Research and knowledge for health** on effective treatment needs to be disseminated to reach health care providers. Structures to ensure relevant research and dissemination of knowledge through different channels and media, such as electronic means, should be in place. Structures include centres for reviews and dissemination (e.g., NHS Centre for Reviews and Dissemination, 2003), economic evaluation in health care (e.g., NHS Economic Evaluation Database, 2003), and evidence based medicine (e.g., Gray 2001).

Policies and strategies to promote evidence based treatment should be **embedded in existing health care policies** (World Health Organization 2003), allowing for the setting of health care targets and the monitoring of treatment services (Department of Health 2003).

Structures to promote **evidence based management** need to be in place (Gray 2001). Technical assistance can be provided for guideline implementation, including the adoption of the guidelines by all participating parties, measures for evaluation, training programs and communication strategies (Bjornson 2000; Anderson & Jane-Llopis 2004).

**Funding health services** and allocating resources can be provided by taxation or insurance (Novotny yet al 2000). In the Netherlands (population 17 million, with 4 million smokers), it has been estimated that full reimbursement for treatment of tobacco dependence would cost €45 million (College voor zorgverzekeringen 2003). It is estimated that this would result in an extra 100,000 smokers (2.5% of all smokers) quitting each year. In England (population 50 million, with 10 million

smokers), new smoking cessation treatment services were introduced to provide high quality services for more tobacco dependent patients (Department of Health 2003). At an annual cost of €34million, 125,000 smokers were found to have successfully quit at 4 weeks follow-up. Costs per life year gained ranged from \$5475 to \$9603, excluding savings to health care costs.

Treatments for tobacco dependence rank as one of the most cost effective of all health care treatments, implying the need to shift resources away from cost ineffective interventions to cost effective interventions for a more efficient use of scarce health care resources.

Referral systems between different clinical specialties or between primary care, secondary care and specialist services should document smoking status and actions taken, so that appropriate interventions and follow-up can be made. Seamless referral systems should ensure that smoking patients are not lost to appropriate treatment or follow-up.

Incentives and role support increase the delivery of more effective treatment by providers. Sufficient resources should be allocated for clinician reimbursement and systems support to ensure the delivery of efficacious tobacco use treatments (Fiore et al 2000).

Organization and management needs to be implemented at all health service levels. This requires a plan, the use of evidence-based interventions and the development of appropriate performance indicators and targets (Hollis et al 2000; Bates et al 2001).

A tool has been developed by the HPs2 project to assess the adequacy of services for the treatment of tobacco dependence (Anderson 2006). The tool is based on a model of five dimensions which can support the implementation of the treatment of tobacco dependence, defined and structured by the Ottawa Charter for Health Promotion (World Health Organization 1986), public health, supportive environments, personal skills, community action and health care systems. The tool assesses the health care systems dimension, which includes the five domains of organization of health care, support for providing treatment, availability of effective treatment, provision of effective treatments by health care providers, and uptake of effective treatments by health care users.

The tool provides a baseline measurement of services for the treatment of tobacco dependence, identifying areas where services may require development or strengthening; provides a mechanism for monitoring service provision over time; allows sharing of information and examples of practice between countries and regions; and provides a mechanism for coalitions or partnerships to discuss and have a shared view on services for the treatment of tobacco dependence.

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## 8. SUPPORTING HEALTH CARE PROVIDERS

### Summary of chapter evidence

**Conditions for effective involvement of primary care providers** A combination of practice-based and educational interventions are effective in increasing health care providers rates of identifying the smoking status of their patients (by 15%), in increasing health care providers advice giving rates to smokers (13%) and the quit rates of their patients (5%).

### Recommendations

**Training programmes** for the treatment of tobacco dependence for health care providers working in primary health care, including general practitioners, general practice based doctors' assistants and nurses, pharmacists, dentists and midwives need development, implementation and accreditation. Training should focus on and be embedded in both vocational and specialist training as well as in continuing medical education.

**Practice based screening**, intervention and referral protocols and aids that are needed for routine use in primary health care facilities, including general practitioners, general practice based doctors' assistants and nurses, pharmacists, dentists and midwives need development, based on clinical guidelines for the treatment of tobacco dependence, to ensure that such care is embedded in normal clinical practice across the chain of health care provision.

**The professional bodies** representing primary care based services should review the needs of primary care providers, and could consider assessing their clinical competence and clinical responsibilities in providing treatments for tobacco dependence.

Professionals working in primary care that are involved with smoking cessation include physicians, nurses, doctors' assistants, administrative and clerical staff, dentists, pharmacists, community nurses and community midwives. Professionals working in secondary health care include obstetricians, paediatricians, midwives, oncologists, cardiologists, lung physicians, ear nose and throat specialists, general physicians, surgeons, psychologists, addiction specialists and psychiatrists. Finally, those working in specialist services include counsellors in specialist services, telephone quit line counsellors and counsellors in community clinics.

Education and training in smoking cessation counselling can increase knowledge and confidence in the ability to help smokers to quit (Leininger & Earp 1993). Although most primary health care providers feel confident in discussing the health effects of smoking with their patients they are less confident about using evidence based smoking cessation techniques (Young & Ward 1998). Skills training is their preferred resource to improve effectiveness (Young & Ward 1998). Trained providers are more likely to offer treatment and have more effective outcomes for their clients (Anderson & Jane-Llopis 2004). All health care providers should have smoking cessation training to an agreed standard by an accredited trainer.

Clinical experience and competence is required for effective treatment. General practitioners accept the need to assist smokers wanting to stop and to refer to specialist services but are less positive about routinely monitoring smoking status and giving opportunistic advice to patients to stop (McEwen et al 2001). They are more willing to give advice to stop to smokers with smoking related diseases (West et al 2000; McEwen & West 2001). The agreed number of patients to be routinely managed (clinical experience) to an agreed clinical standard (competence) remains to be determined.

Clinical accountability obligates health care providers to provide treatment as part of normal clinical practice similar to other chronic disorders such as hypertension and diabetes. Failure to do so could be regarded as clinical negligence. Legal opinions have advised that physicians should routinely record the smoking status of their patients and routinely advise their smoking patients to quit (Britton & Pillnas 2001; Canadian College of Family Physicians 1998a, 1998b). Convincing health professionals to treat tobacco dependence as a chronic illness may enhance their clinical responsiveness and responsibility (World Health Organization 2003).

Motivation to provide treatment for smoking cessation can be diminished by negative views held by health care providers (McEwen et al 2001). General practitioners generally do not accept that they should give opportunistic advice at every opportunity and only a minority do this (West et al 2000). Barriers to the motivation of health care providers in the treatment of tobacco dependence include uncertainty or misinformation about effective smoking cessation strategies, lack of reimbursement, lack of time, inadequate training in all health care settings, lack or support for routine assessment, lack of resources and lack of patients' motivation and interest to quit (World Health Organization 2003; Young & Ward 2001). Primary health care providers' preferred strategies for smoking cessation include resources for patients, subsidised pharmacotherapy, pamphlets and free access to smoking cessation clinics (Young & Ward 1998). Identified barriers to smoking cessation need to be addressed through educational and structural interventions (Anderson & Jane-Llopis 2004).

Communication with patients and skilled use of language are pre-requisites for effective treatment (Coulter 1998). Effective communication requires the provision of evidence-based information, interpretation of that information by the patient and discussion between the provider and the patient. Communication skills can be monitored and measured and advice given on their improvement (Skelton & Hobbs 1999).

Treatment provision should be according to agreed guidelines and protocols. All health care providers should ask about tobacco use, give advice to tobacco users to quit, assess the willingness to make a quit attempt, assist in the quit attempt and arrange follow-up for all health care service users (Fiore et al 2000). Treatment provision that fails to adhere to guidelines can be a source of litigation (Hurwitz 1998).

Although many health professionals agree that recommending smoking cessation is part of their duties, the treatment of tobacco addiction is scarcely integrated into daily practice (Ockene et al 1997; Thorndike et al 1998; Young & Ward 2001; McEwen et al 2001; McEwen & West 2001). The reasons given for this are lack of time, lack of knowledge and training, frustration about the low success rates, low motivation of the patient, costs and the lack of specialist support.

A systematic review that was carried out into the effectiveness of various forms of educational or practice-oriented programmes to investigate the involvement of health professionals in the treatment of tobacco addiction based on the methodology of the Effective Practice and Organisation of Care Group (EPOC) of the Cochrane Collaboration (Bero 2002) identified twenty-four programmes. The programmes lead to a 15% increase in the numbers screened by the practitioner over and above the average numbers screened of 48%, to a 13% increase in the giving of a stop advice over and above the average stop advice of 51%, and up to a 4.7% increase in biochemically-validated cessation figures over and above an average of 16.9% (Anderson & Jane-Llopis 2004).

Programmes with more than one component were found to be more effective than programmes with just one component in the improvement of screening implementation or giving an advice to stop. Programmes in which educational and practice methods were combined, were found to be more effective with respect to an increase in screening than programmes that only contained one of these components.

Programmes outside the practice were found to be more effective than programmes in the practice with respect to increasing the use of biochemically-validated cessation figures. Programmes for trainee health professionals were found to be more effective than programmes for qualified health professionals. Programmes for trainee health professionals were found to be more effective with respect to an increase in the giving of an advice to stop and cessation figures, but not in terms of screening figures. Educational interventions which took place within the practice, consisted mostly of single interventions and were focused on tobacco, were found to be effective. For qualified health professionals, programmes were found to be effective with respect to changes in the screening and advice to stop, but not in terms of the number of smokers stopping. Programmes which took place outside of the practice, contained more than one intervention and combined education with practice, were found to be the most effective.

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## 9. SUPPORTING HEALTH CARE USERS

### Summary of chapter evidence

**Conditions for effective involvement of smokers** Users' knowledge of the harm and addictiveness of tobacco products and the why and how of treatment can enhance treatment effectiveness. Their treatment seeking behaviour influences treatment provision, their intentions to quit are a predictor of successful quit attempts, and their persistence with treatment can increase success rates.

### Recommendations

**Communications strategies** need to be extended and implemented to motivate smokers to stop, and to communicate a health message to smokers on the availability of effective help.

**Monitoring services** for the treatment of tobacco dependence should include an assessment of the quality of services delivered, and an assessment of the number of extra quit attempts gained.

Users' knowledge of the harm and addictiveness of tobacco products and the why and how of treatment can enhance treatment effectiveness (Shar & Gutierrez 2001). Smokers continue to underestimate the harm done by tobacco and the addictiveness of nicotine (Chaloupka et al 2001; Peck et al 2000). Tobacco dependence is often accompanied by unrealistic fears about treatment as well as the assumption that treatment is not needed (World Health Organization 2003). Social support for quitting should be emphasized as both social support as part of treatment and help in securing social support outside of treatment are effective in increasing quitting (World Health Organization 2003; Lindstrom et al 2003).

Users' perspectives and preferences for treatment need to be accounted for when delivering effective treatment. Barriers in searching for treatment or accepting help such as psychological pressure in accepting dependence on tobacco need to be overcome (Henningfield 2000). Other barriers include social pressure from former smokers who quit without formal assistance suggesting that quitting can easily be done alone (Henningfield 2000). Similarly, treatment utilisation can be limited because treatments are not as attractive from an image perspective, nor pharmacologically engineered to maximise pleasure as are tobacco products (Henningfield 2000).

Users' treatment seeking behaviour influences treatment provision. It is likely that the greater the demand by tobacco users for treatment, the greater the responsiveness of health care providers to provide treatment. Users' treatment behaviour can be increased by educational campaigns focusing on how to quit and giving information on the availability of services for treatment (Linton 2003; Mudde & deVries 1999); and reducing the cost barriers to treatment, such as through reimbursement (Kaper et al 2003).

Users' intentions to quit are a predictor of successful quit attempts. Smokers unwilling to try to quit tobacco use should be provided with a brief intervention designed to increase their motivation to quit, for example the 5 R's model which includes:

relevance; risks; rewards; roadblocks and repetition (Fiore et al 2000). Smokers might be more receptive to advice to stop when it is linked with existing medical conditions (West et al 2000).

Users' persistence with treatment can increase success rates (Fiore et al 2000). Knowledge and communication skills of patients increase compliance with treatment (Cegala 2000).

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