



# British Thoracic Society Recommendations for Hospital Smoking Cessation Services for Commissioners and Health Care Professionals

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## EXECUTIVE SUMMARY

This document has been prepared to provide recommendations for a hospital smoking cessation service. The document describes the evidence base for the most effective smoking cessation treatments for patients and staff who smoke tobacco, mainly via cigarettes, attending secondary care in the UK. We have recommended key components for a hospital-based smoking cessation service that can be used to guide commissioners and audits. We have highlighted areas for further research and training.

Details of the BTS Stop Smoking Champion Project are available at <http://www.brit-thoracic.org.uk/delivery-of-respiratory-care/stop-smoking-champions.aspx>

The British Thoracic Society policy on tobacco is available at:

<http://www.brit-thoracic.org.uk/Portals/0/About%20BTS/Governance/TobaccoPositionStatementNew%20branding%20JUL11.pdf>

## Summary of recommendations for smoking cessation in secondary care

### Infrastructure

1. Each hospital should have a Stop Smoking Champion (preferably a senior member of clinical or managerial staff) to establish a Smoke Free Hospital and centralise Stop Smoking as part of their health-promotion.
2. All Health Care Professionals should be aware of their Hospital's Smoking Policy.

### Interventions for cigarette smokers

3. Frontline hospital staff should receive Level 1 stop smoking training and know how to refer onto a specialist service for those smokers wanting further help.
4. Smoking status should be recorded in the notes at every attendance.
5. Licensed pharmacotherapy for smoking cessation should be readily available at all times of day in the hospital wards / pharmacy.
6. Smoking cessation interventions and pharmacotherapy should be recorded in notes and discharge summaries as a medical intervention.
7. There should be a specific post(s) in each hospital designated to specialist smoking cessation counselling.

8. The Hospital Smoking Cessation Service (HSCS) should have a dedicated office, phone, computer (email) and access to all specialities.
9. There should be a named Consultant, Senior Nurse or Hospital Manager (Stop Smoking Champion) responsible for supporting the HSCS.
10. The HSCS should offer smokers interested in quitting:
  - a) Around 40-60 minutes initial consultation
  - b) Weekly follow-up appointments of 10-20 minutes for at least 4 weeks
  - c) Phone call contact at 3 and 6 months
  - d) Self-reported quitters should be offered a final appointment at 12 months
11. The Hospital Smoking Cessation Practitioner (HSCP) should be able to prescribe or recommend medications so that all patients and staff who want to quit have timely access to all licensed pharmacotherapies
12. The HSCP-led service should be flexible allowing more intensive and prolonged support / pharmacotherapy, when needed.
13. Smoking status should be validated at each visit to the smoking cessation programme (usually by exhaled carbon monoxide).

## BACKGROUND: IDENTIFYING THE NEED

### Tobacco Smoking

In the most recent large scale survey, around 21% of adults in the UK reported that they currently smoked cigarettes and the overall prevalence has been at this level since 2007.<sup>[1]</sup> Tobacco smoking accounted for around 19% of all UK deaths in 2005 and directly cost the National Health Service (NHS) at least £5.2 billion that year.<sup>[2]</sup> This underestimate did not include indirect costs to the economy, the damage from passive smoking or all tobacco related diseases. Around 70% of the total NHS cost in treating tobacco related illness is now falling on secondary care.<sup>[3]</sup> Very substantial savings to the NHS can be made by lowering background population prevalence of smoking<sup>[4]</sup> but this document concentrates on smoking cessation strategies for patients and staff attending hospitals.

Up to 70% of smokers attending hospital for a variety of reasons say that they would like to stop<sup>[5]</sup> and stopping smoking is central to treatment and prognosis of almost every disease. It is especially vital for those with smoking-related diseases. A hospital-based smoking cessation service (HSCS) could help both in-patients and support out-patients in quitting as their diagnoses are made and other treatments instituted and completed. For example, stopping smoking is the only intervention in COPD that can reduce all four core symptoms (cough, wheeze, breathlessness and chest pain) and simultaneously slow the decline in lung function<sup>[6]</sup>, reduce COPD readmissions<sup>[7]</sup> and mortality.<sup>[8]</sup> Smoking cessation is certainly one of the most cost effective treatments for patients with COPD, at around a maximum of £2000 per quality adjusted life year (QALY).<sup>[9]</sup> Stopping smoking is also important and very effective at all stages of ischaemic heart disease, one of the commonest reasons for acute hospital admissions.<sup>[10]</sup> Reviews of large surgical databases (consisting of over 250,000 operations) confirm that active smoking at the time of surgery independently increases post-operative risk and many complications ( $p < 0.001$ )<sup>[11]</sup> in all types of surgery compared with even ex-smoking with a clear temporal relationship and significant dose-response between amount smoked and adverse outcome.<sup>[11, 12]</sup> Further, smoking cessation for at least 4 weeks before surgery reduces complications, morbidity and length of stay.<sup>[13]</sup> People with mental health problems die on average 16-25 years sooner than the general population and have higher rates of respiratory, cardiovascular and infectious disease.<sup>[14]</sup> Increased smoking is responsible for most of the excess mortality of people with severe mental health problems and adults with mental health problems smoke 42% of all tobacco in England with 70% of inpatients with Serious Mental Illness (SMI) being current smokers<sup>[15]</sup> and 40% of patients living with mental health conditions smoking.<sup>[16]</sup> In a longitudinal study

of 174 clients with mental illness and co-morbidity, 75% tried to quit at least once over the 11 years of the study, although none received NRT or bupropion. Only 17% were not smoking at the 11-year follow-up.<sup>[15]</sup>

Hospitalised smokers are extremely likely to have a smoking related illness (often the cause of their attendance) and these people represent a particularly high-risk group who remain extensive healthcare users. A recent US Joint Commission on smoking cessation measures discusses the 'need to .... mandate the delivery of evidence based tobacco-dependence counselling and medication for all admitted patients who use tobacco. ...hospitals identify and document the tobacco-use status of all admitted patients, provide both evidence-based cessation counselling and medication during hospitalisation for all identified tobacco users (in the absence of contraindications or patient refusal), provide a referral at discharge for evidence-based cessation counselling and a prescription for cessation medication (in the absence of contraindications or patient refusal), and document tobacco-use status approximately 30 days after discharge'.<sup>[17]</sup>

Admission to hospital provides an opportunity to help stop smoking as people should be more open to help at a time of perceived vulnerability i.e. 'seize the moment' where motivation is translated into immediate action.<sup>[18-20]</sup> A cessation attempt also depends on the environment so smokers may find it easier to quit in a place where smoking is restricted or preferably completely prohibited, where there are fewer cues (e.g. family members who smoke) and where pharmacotherapy is readily available. We now know that recent /initial hospitalisation is an independent predictor of abstinence at two months in people enrolled in a cessation programme [21] and long term cessation is higher in people who have been admitted to hospital, even without a cessation intervention. Among hospitalised patients receiving smoking cessation intervention, low dependence on tobacco, and motivation to quit by sudden cessation were the main independent predictors of smoking abstinence after discharge from hospital<sup>[21]</sup>, and especially if they are admitted for a smoking-related disease.<sup>[22]</sup> Giving hospitalised patients expert advice on how to quit smoking and information on how their diseases and symptoms are related to tobacco use is crucial.<sup>[23]</sup> Patients could also directly experience the mitigation of withdrawal symptoms provided by tobacco-cessation medications during forced abstinence in a hospital. Moreover, concentrating services where many smokers are already located is opportunistic, effective<sup>[10]</sup> and certainly cost-effective.<sup>[24]</sup>

An increasing number of countries are providing smoking cessation treatments for free or at low cost as national programmes. In 1999, the UK became the first country in the world to introduce smoking cessation treatment as a

programme covered by the National Health Service (NHS). The institutionalisation of smoking cessation programmes in the UK was promoted significantly by a review of the clinical efficacy and cost-effectiveness of smoking cessation treatment on the basis of published evidence<sup>[25]</sup> and the smoking cessation guidelines for healthcare professionals<sup>[26]</sup> prepared according to the review that were later updated.<sup>[27]</sup>

Despite this large body of evidence, many hospitalised patients are not prescribed guideline-recommended smoking cessation treatments.<sup>[28, 29]</sup> In 2003 a survey of 260 UK Hospitals (with a 91% response rate) by the British Thoracic Society (BTS) suggested only around 50% had a dedicated smoking cessation service on-site.<sup>[30]</sup> Responders offering an intensive service and validating quit rates over at least 6 months, attended a forum in 2003 from which the BTS Recommendations on Hospital Smoking Cessation Services were created.<sup>[31]</sup> Two more paper BTS national surveys in 2008<sup>[32]</sup> and most recently an e-survey in 2011, confirmed a slight overall increase in hospital provision but many UK hospitals have lost their smoking cessation services and there remains widespread disparity between the availability, location and content of the hospital services throughout a country internationally acknowledged for strong tobacco control measures.

NICE guidelines in 2003 recommended "Arrangements should be made to ensure that smoking cessation advice and support is available to patients at both community and hospital locations."<sup>[33]</sup> These have been superseded by other guidelines that state: Hospital patients who use tobacco in any form should be offered advice and, if appropriate, NRT from a trained health professional or smoking cessation adviser while in hospital to help them to quit<sup>[34]</sup>. There is a current NICE call for appraisal for smoking cessation in secondary care services (2011-12).

## Cannabis smoking

Combined tobacco and cannabis smoking is common with one recent survey reporting it occurs in 1 in three hospitalised smokers.<sup>[35]</sup> Regular cannabis smoking is prevalent amongst all ages and groups in society, and a history of cannabis smoking has to be elicited as it is rarely volunteered. A survey of 7,296 11-15 year-old secondary school pupils found that 8% reported regularly smoking cannabis<sup>[36]</sup> and 1 in 5 young adults say they have recently used drugs, mostly cannabis.<sup>[37, 38]</sup>

There is increasing evidence that smoking cannabis causes respiratory symptoms including increased wheezing, daily cough and sputum production.<sup>[39]</sup> There is an increased risk of COPD after as little as 50 'joints' smoked with tobacco, which is synergistic with cannabis.<sup>[40]</sup> Cannabis smoking in young people has been associated with pneumothoraces,

where computerised tomography (CT) scanning reveals co-existent apical bullous emphysema and lung histology confirms inflammation and heavily pigmented macrophages.<sup>[41]</sup> Regular cannabis use is independently associated with an increased risk of developing lung cancer with an odds ratio (OR) of 2.4 (95% confidence interval [CI]: 1.6-3.8) after adjusting for country, age, tobacco smoking, and occupational exposure.<sup>[42]</sup> There appears a dose response of cannabis smoking and lung cancer with the risk increasing by 8% (95% CI 2-15) for each joint-year, after adjustment for confounding variables - compared to 7% increased risk for each pack-year cigarette smoking.<sup>[43]</sup>

## Waterpipe smoking (WPS)

The prevalence of WPS varies significantly by country, gender, age and ethnicity but it is increasingly common in the UK and worldwide. There have been case reports of WPS and acute carbon monoxide poisoning.<sup>[44, 45]</sup> WPS may cause COPD; a meta-analysis of six cross-sectional studies concluded that WPS negatively affects lung function and may be as harmful as cigarette smoking.<sup>[46]</sup> These studies had methodological limitations and there is a paucity of longitudinal data.

WPS contains large amounts of carcinogens such as hydrocarbons and heavy metals.<sup>[47]</sup> The role of WPS in human oral cancers remains uncertain because of the limited number of investigations and no long term data but some propose that human oral normal epithelial cells are vulnerable to neoplastic transformation by exposure to persistent WPS.<sup>[48]</sup> Others have reported WPS having acute adverse effects on blood pressure, heart rate, respiratory rate<sup>[49]</sup> and markers of airway<sup>[49]</sup> and vascular<sup>[49, 50]</sup> inflammation. A considerable amount of fine particles (e.g. PM 2.5) are emitted by waterpipe smokers similar to cigarette smoking.<sup>[51]</sup> Larger scale, longitudinal studies with clinical endpoints in WPS are needed. A Cochrane-review did not find a single study of WPS cessation strategies.<sup>[52]</sup>

## THE EVIDENCE FOR TOBACCO SMOKING CESSATION IN A HOSPITAL SETTING

### Hospital Smoking Policies

Since 1963, there have been calls to ban smoking in hospitals.<sup>[53]</sup> It has taken 40 years but now nearly all UK hospitals have complete or partial smoking bans on their grounds and premises. Many extend this ban to staff in uniform (off site) and in all hospital cars. However, these bans are often poorly adhered to and usually not enforced.<sup>[29, 54, 55]</sup> For example, in one survey, 88% of staff reported regularly seeing patients (and staff) smoking in a hospital with a so-called 'complete' ban.<sup>[56]</sup>

Staff support for the bans is wide<sup>[55]</sup> but confidence in dealing with a smoking patient on the premises is variable with confidence reported to be lower in nurses than in doctors.<sup>[54, 56]</sup> Moreover 77% of staff would like formal training in dealing with / counselling smokers but only 3% reported receiving any training on smoking cessation.<sup>[56]</sup>

What about the costs to the employer of staff smokers? A report for Canadian Health Ministry estimated that every member of staff who smokes, costs an extra \$3396 through higher absenteeism, lower productivity and higher insurance costs. These costs to the employer for each smoker on their payroll have risen since 1997 but the costs of smoking treatments have fallen.<sup>[57]</sup>

A Level 1 and Level 2 service is equivalent to the National Centre for Smoking Cessation and Training (NCST) Training and Assessment Programme Stage 1 and 2 of basic knowledge regarding smoking and how to assess a smoker as well as giving basic behavioural intervention. (<http://www.ncst.co.uk/training/training-and-assessment/ncst-stage-1-training-and-assessment-programme>).

**Level 1 Service: Able to take a smoking history and provide basic information on smoking and smoking cessation and know how to refer on to local stop smoking services. ([www.ncst.co.uk/training](http://www.ncst.co.uk/training))**

#### Who should offer basic advice?

Meta-analysis of 20 RCTs involving over 30,000 patients attending hospital suggests nursing-delivered interventions significantly increase the odds of quitting (OR 1.47, 95% Confidence Interval (CI) 1.29–1.68). This was probably more effective for hospital inpatients but interventions in non-hospitalised patients also showed benefit.<sup>[58]</sup>

Doctors are very influential sources of information on smoking cessation<sup>[59]</sup> and doctors frequently (but not always) advise patients to improve their health by stopping smoking. As most

smokers would like to quit, motivational interviewing and a supportive rather than a judgemental approach is best. A meta-analysis of pooled data from 17 RCTs, looked at physician advice, mainly in primary care but also in hospital wards and outpatient clinics. These involved over 31,000 smokers (some with specified diseases but most were from unselected populations).

How intense should basic advice be?

Brief advice (1-2 minutes targeting advice to general health issues) versus no advice led to a significant increase in the rate of quitting (relative risk (RR) 1.66, 95% CI 1.42 to 1.94).<sup>[60]</sup>

**Level 2 Service: able to tailor specific advice to the smoker's illness and record and monitor outcomes. To have an understanding of basic pharmacotherapy prescribing and to be able to refer heavily addicted smokers for intensive support. ([www.ncst.co.uk/training](http://www.ncst.co.uk/training))**

An example of this higher level but still relatively basic intervention is the '5 A's approach': Ask, Advise, Assess (willingness to quit), Assist, Arrange (follow-up with a specialist). This approach (Level 2) can still be delivered by any health professional and takes 5 to 10 minutes. It is certainly applied and reapplied by smoking cessation practitioners (see below). Amongst 11 trials where the intervention was judged to be more intensive the estimated effect (versus no advice) was higher still (RR 1.84, 95% CI 1.60 to 2.13).<sup>[60]</sup>

Stepped-care interventions (starting with low-intensity intervention and then exposing treatment failures to successively more intense interventions) has not been shown to be effective, even in smokers with coronary artery disease – who traditionally have higher quit rates.<sup>[61]</sup> Direct comparison of intensive versus minimal advice showed a significant dose-response effect with the advantage of intensive advice (OR 1.37, 95% CI 1.20 to 1.56).<sup>[60]</sup> If we assume Hospitals should offer the best support to the most vulnerable smokers, they have various options to deliver more intensive advice:

Secondary care has different options to develop their stop smoking services up to level 2:

#### Option 1: Train all staff to deliver basic interventions

The type and standards of training for smoking cessation practitioners can vary. A survey of self-reported practices, attitudes and training of practitioners in the English NHS Stop Smoking Service suggested gaps between their practice and evidence-based guidelines may be due to inadequate training. However, the survey highlighted that 'specialist' practitioners (usually based in hospitals) did report more days training than



'community' practitioners (4.1 vs 3.0,  $p=0.002$ ) and more days observing an experienced practitioner when starting work (12.0 vs 6.6,  $p<0.001$ ). These gaps in training may reflect differences in success rates between hospitals and possibly between community and secondary care services.<sup>[62]</sup> There are many challenges faced in supporting smokers in a hospital. These include acute medical illness, potential for drug interactions and drug side effects in reduced renal or hepatic clearance, altered drug pharmacodynamics when abruptly stopping smoking, masking of acute nicotine withdrawal as concurrent illness (e.g. nausea, tachycardia).

Individual studies show that brief intervention training to general Health Care Professionals (HCPs) significantly increased their knowledge of psychological skills and use of pharmacotherapy but led to no changes in the extent to which HCPs ask, register patients' smoking status, assess willingness to quit or actually advise patients to quit.<sup>[63]</sup> Other studies training physicians in Primary Care have also had limited success in changing HCPs actions and no effect in reducing overall smoking.<sup>[64]</sup>

This disappointing trend is confirmed in a meta analysis where 8 out of 10 studies (involving over 10,000 patients) randomising HCPs to be trained on either smoking cessation or nothing -showed increases in smoking cessation activity (more advice and nicotine replacement therapy (NRT) prescribing) but no decrease in smoking rates. The reviewers concluded:

"Training health professionals to provide smoking cessation interventions had a measurable effect on professional performance. There was no strong evidence that it changed smoking behaviour."<sup>[65]</sup>

However, all of these studies were based entirely in primary care (doctors, dentists and pharmacists) and may not be applicable to secondary care HCPs or their environment. We could find no studies looking at the effects of basic training to all HCPs from secondary care on smoking cessation. It does seem that even well-designed training packages of generic HCPs are missing a key ingredient or remain compromised by other demands on HCP time /duties.

#### **Option 2: Refer hospitalised patients to a community service on discharge.**

Around 50% of hospitals in the UK have no hospital based smoking cessation service.<sup>[30, 66]</sup> They instead may advise their smoking patients to contact a community-based stop smoking service on discharge and do not offer any intensive support to quit whilst the smoker is an inpatient

Referral from secondary to community services was tested in a single-blinded trial, where 450 consecutive smokers, attending

two UK hospitals had varying intensities of hospital input. They were then given contact details of their community service or received specific appointments to the community smoking cessation service before discharge from the HSCS. Not a single smoker (from 150 randomised to this arm) who were given basic advice and provided with cards for the community service whilst in hospital, contacted their local community smoking cessation service within the recommended 5 weeks. Even when the smoker and hospital doctor HSCS agreed a specific time and location to attend a community service on discharge, only 23% of the patients already completing 4 weeks of HSCS treatment actually attended the community service the following week. Throughout the next 12 months only 3-7% of patients enrolled in the HSCS programme attended for treatment and validation to the community service. However, 17-23% of patients re-attended the original HSCS for validation at 55 weeks, when unexpectedly asked. The study concluded that hospitalised smokers do not switch well to a community-based service following any referral strategy. The authors (who were from both secondary and community smoking cessation services) interviewed some smokers and staff and suggested that the most likely explanation for the poor transfer between services is the rapport and close, personal relationship the participants developed with the HSCS early on and a later reluctance to transfer this relationship to another professional.<sup>[67]</sup>

#### **Level 3 Service: A dedicated hospital smoking cessation practitioner (HSCP) based within the hospital**

Such an individual would be trained to Level 3 i.e. they would have completed Level 1 and 2 training and also a course in behavioural support, focussing on the core skills required for stop smoking practitioners and have a full understanding of licensed pharmacotherapies. They should also offer training / advice and support to NHS staff and other smoking cessation providers. (e.g. see [www.ncst.co.uk/training](http://www.ncst.co.uk/training))

A dedicated smoking cessation practitioner based within a hospital increases referral and treatment rates, provides an accessible and flexible appointment service for staff wishing to quit, promotes hospital smoking policies and helps train other staff.<sup>[10, 68, 69]</sup> The specialist service usually offers intensive initial support, typically taking 30 to 60 minutes at the first consultation and arranges early follow-up appointments.

#### **Type of behavioural support**

Applied theoretical models used in HSCS include motivational interviewing techniques where the relationship is client-centred and the specialist's role is to resolve ambivalence. Other techniques including cognitive behavioural therapy also require

a collaborative relationship, needing active participation; these techniques are goal-orientated and problem-focused.

The trans-theoretical (stages of change) model applies an integrative framework for understanding, measuring, and intervening in behaviour change, change being seen as a progression through five stages (pre-contemplation, contemplation, action, maintenance and relapse).

In contrast to this a model of the process of change based on "catastrophe theory" was more recently proposed, in which smokers have varying levels of motivational "tension" to stop and then "triggers" in the environment result in a switch in motivational state. If that switch involves immediate renunciation of cigarettes, this can signal a more complete transformation than if it involves a plan to quit at some future point. The evidence for this comes from a cross sectional household survey of 918 adults smokers who have tried to quit and 996 ex-smokers. 49% of smokers reported that their most recent quit attempt was put into effect immediately the decision to quit was made. Importantly, unplanned quit attempts were more likely to succeed for at least six months than planned attempts (OR 2.6, 95% CI: 1.9 to 3.6) irrespective of age, sex, and socioeconomic group.<sup>[20]</sup> This fits with the above findings that recent hospitalisation increases the odds of short and long-term quitting even if no treatment was offered.<sup>[21, 22]</sup>

No single counselling approach appears superior probably as smokers have so many needs and drivers<sup>[10]</sup> and in practice, a combination of these models allows flexibility according to how the interview progresses.

#### **Group versus individual intensive counselling:**

Group therapy in theory could be more cost-effective than individual counselling and individuals could provide each other with mutual support. This is at the expense of a tailored approach to individual illness and many smokers attending hospitals have much more specific needs. RCTs confirm group programmes are better than self help or no intervention (OR 2.17, 95% CI 1.37–3.45) but no more effective than a similar intensity of individual counselling.<sup>[70]</sup> Individual counselling from a smoking cessation practitioner, not involved in other aspects of patient care has been attempted since 1972.

Meta-analysis of 18 trials confirms individual counselling is more effective than control (OR of quitting 1.56, 95% CI 1.32–1.84) but the reviewers were still unclear on exact definitions of intense versus brief counselling.<sup>[71]</sup>

Aversive smoking (i.e. rapid high dose to cause discomfort) is not recommended without a better evidence base<sup>[72]</sup> and poses obvious risks in acutely or chronically unwell patients.

In every day clinical settings, intensive support has better outcomes than minimal advice.<sup>[73–75]</sup>

#### **How long should intensive treatment last?**

Meta-analysis suggests that even intensive smoking cessation counselling to hospitalised smokers is effective only if supportive contacts continue for more than 1 month after discharge. The success of smoking treatment sessions lasting less than 4 weeks is low, confirming that prolonged follow-up and support is essential.<sup>[10]</sup>

When looking at the effects of brief advice (in primary care), only one study offered follow-up. This study showed the biggest improvement with a doubling of the sustained, validated quit rate at 1 year (8.8% versus 4.4%).<sup>[76]</sup>

Most Department of Health (DoH) funded community programmes / service agreements follow quit rates at 6 or occasionally 12 weeks.<sup>[77]</sup> Direct comparison of different strategies continually demonstrates the benefit of follow-up visits.<sup>[60]</sup>

### **Pharmacotherapy**

In addition to behavioural therapies, various pharmacologic strategies have been developed to help achieve this goal. First-line therapies include nicotine replacement (NRT), bupropion and varenicline, a partial nicotine agonist.

#### **NRT**

The aim of NRT is to replace nicotine from cigarettes, by reducing withdrawal symptoms associated with smoking cessation it helps resist the urge to smoke. A review in 2006 of 123 RCTs compared different forms of NRT (chewing gum, transdermal patches, nasal spray, inhalers and tablets) against placebo or non-NRT control group; all trials lasted at least 6 months and had biochemically validated quit rates. The odds ratio (OR) for abstinence with NRT compared to control was 1.77 (95% CI: 1.66 to 1.88). The ORs for the different forms of NRT were 1.66 (95% CI: 1.52 to 1.81) for gum, 1.81 (95% CI: 1.63 to 2.02) for patches, 2.35 (95% CI: 1.63 to 3.38) for nasal spray, 2.14 (95% CI: 1.44 to 3.18) for inhaled nicotine and 2.05 (95% CI: 1.62 to 2.59) for nicotine sublingual tablet/lozenge. These odds were largely independent of the duration of therapy, the intensity of additional support provided or the setting in which the NRT was offered. In highly dependent smokers there was a significant benefit of 4 mg gum compared with 2 mg gum (OR 2.20, 95% CI: 1.85 to 3.25). There is some evidence that combinations of forms of NRT are more effective than individual forms.<sup>[78]</sup> Higher doses of nicotine patch may produce small increases in quit rates. The reviewers concluded:



'all of the commercially available forms of NRT are effective as part of a strategy to promote smoking cessation. They increase the odds of quitting approximately 1.5 to 2 fold regardless of setting.'<sup>[79]</sup>

A recent meta-analysis of 12 well-designed RCTs of NRT lasting more than 1 year comprising over 4700 patients in primary and secondary care, yielded a similar OR in favour of NRT of 1.99 (95% CI 1.50–2.64). The effectiveness of NRT was maintained (over 2–8 years) and interestingly did not depend on duration of initial treatment. However, after 1 year, 30% of quitters in both the NRT and control groups still relapsed but hardly any relapsed after the second year.<sup>[80]</sup> This work confirms the longer term benefits of NRT and it is recommended by NICE for smoking cessation.<sup>[34]</sup>

The Cochrane database was re-analysed in 2007 to see if the source of funding affected results of NRT trials. Industry sponsored trials were larger ( $n=479$  versus 268,  $p=0.04$ ) and were more likely to find statistically positive results favouring NRT (51% trials versus 22% non-industry trials, OR 3.7). This difference was not explained by trial characteristics but better funding may have led to higher treatment compliance and therefore greater efficacy. Importantly, there was funnel-plot asymmetry among industry trials ( $t=4.35$ ,  $p<0.001$ ), but not among other trials, indicating that several small null-effect industry trials may not have reached publication. However, even after adjustment for this possible bias, the authors still concluded the "net effect for these products remains of considerable public health benefit."<sup>[81]</sup> Moreover, compulsory registration of all trials since should reduce publication bias in future.

### NRT Preloading

Meta-analysis of four eligible studies showed that compared to starting active patch treatment on quit day, pre-cessation treatment with nicotine patches was found to double the odds of quitting at 6 weeks [OR = 1.96, 95% CI: 1.31-2.93] and at 6 months (OR = 2.17, 95% CI: 1.46-3.22).<sup>[82]</sup>

### NRT Cut down to quit

NRT-supported smoking reduction or Cut Down To Quit (CDTQ) is an effective intervention in achieving sustained smoking abstinence for smokers who declare unwillingness or inability to attempt an abrupt quit. The 12-month sustained quit rate (approximately 5.3% with NRT versus approximately 2.6% with placebo) is considerably less than that documented for an abrupt quit NRT regime. Most benefit comes from trials with considerable patient-investigator contact but CDTQ is still highly cost-effective compared with no quit attempt.<sup>[83]</sup>

### Varenicline

Varenicline is an orally administered partial agonist of the  $\alpha 4\beta 2$  nicotinic acetylcholine receptor. It is almost entirely absorbed following oral administration and has no clinically relevant drug interactions. In two identical, randomised, double-blind, phase III clinical trials in healthy, motivated-to-quit, mainly Caucasian smokers aged 18-75 years, 12 weeks of treatment with varenicline titrated to 1 mg twice daily was associated with significantly higher abstinence rates over weeks 9-12 than sustained-release bupropion titrated to 150 mg twice daily or placebo.<sup>[84, 85]</sup> In a separate phase III trial, an additional 12 weeks of treatment in smokers achieving abstinence was associated with greater abstinence through to week 52 than placebo treatment.<sup>[86]</sup> In a randomised, open-label, multi-national, phase III trial, varenicline treatment was associated with a significantly higher rate of abstinence than NRT patches at 12 weeks but similar rates at 52 weeks.<sup>[87]</sup> Nausea and abnormal dreams were the most common adverse events that occurred in more varenicline than placebo recipients. Adverse events associated with varenicline therapy have been reported in post-marketing surveillance, including neuropsychiatric events such as depressed mood, agitation, changes in behaviour, suicidal ideation and suicide. Currently, it is unclear whether the association of varenicline therapy with these adverse events is causal, coincidental or related to smoking cessation /withdrawal. See excellent review by Jimenez-Ruiz.<sup>[88]</sup>

However, varenicline is a valuable pharmacological aid to smoking cessation and recommended in current NICE guidelines.<sup>[34]</sup>

Research on varenicline CDTQ is ongoing so it cannot be recommended for this yet.

### Antidepressants for smoking cessation

A meta-analysis of 31 trials where bupropion was the sole pharmacotherapy showed it roughly doubled the chance of quitting (similar to NRT), OR 1.94, (95% CI: 1.72 to 2.19).

Pooled analysis of four trials of nortriptyline was similar OR 2.34 (95% CI 1.61 to 3.4). Adding bupropion or nortriptyline to NRT or extending therapy to prevent relapse provides no additional long-term benefit.

Bupropion seems less effective than varenicline (OR of quitting 0.60, 95% CI 0.46 to 0.78). There is a risk of about 1 in 1000 of seizures associated with bupropion use and this adverse publicity has limited its use in the UK compared with the US or Europe. Concerns that bupropion may increase suicide risk are currently unproven. Nortriptyline has the potential for serious

side-effects, but none were reported in these few small trials for smoking cessation.

The monoamine oxidase B inhibitor selegiline hydrochloride is well tolerated but trials have shown no advantage over placebo in smoking cessation, either as an oral<sup>[89]</sup> or transdermal<sup>[90]</sup> system, even when combined with behavioural support.

Fewer trials of fluoxetine, sertraline, paroxetine, moclobemide, and venlafaxine detected no benefit in smoking cessation.<sup>[91]</sup>

### Other pharmacotherapy

Clonidine is an alpha adrenergic agonist used for hypertension, migraine and menopausal flushing. Metanalysis showed a pooled odds ratio for success with clonidine (combined with behavioral support) versus placebo to be 1.89 (95% CI: 1.30 to 2.74) i.e. similar benefit to NRT.<sup>[92]</sup> However, the number of trials was small, side-effects were significant and it is not licensed for smoking cessation.

The most up to date metanalysis of cannabinoid-1 receptor antagonists suggested rimonabant 20 mg may increase the chances of quitting approximately 1.5-fold and weight gain was less in quitters but the evidence for rimonabant in maintaining abstinence is inconclusive<sup>[93]</sup> and post marketing surveillance suggested links to mental disorders. Taranabant was also suspended by its manufacturers due to unacceptable side-effects.

A recent RCT suggested that cytisine, a partial agonist that binds with high affinity to the alpha(4)beta(2) nicotinic acetylcholine receptor improves quit rates.<sup>[94]</sup>

Opioid receptor antagonists, bromocriptine, anti-anxiety drugs, nicotinic receptor antagonists (e.g. mecamylamine) and glucose tablets show no benefit.

To date, five phase I/II clinical trials using vaccines against nicotine have been published.<sup>[95]</sup> Four nicotine vaccine candidates have advanced into clinical testing with mixed success. Proof-of-concept has been established in that individuals with higher levels of anti-nicotine antibodies were observed to have higher smoking cessation and abstinence rates. Recently, the most advanced candidate vaccine, NicVAX, failed to meet the primary endpoint in two large phase III studies, although the correlation of higher abstinence rates in subjects with higher immunity to nicotine was observed.<sup>[96]</sup>

Other various new approaches under consideration include inhibitors of the hepatic P450 enzyme (e.g. methoxsalen), dopamine reuptake inhibitors and selective dopamine D3 antagonists.<sup>[97]</sup> See review by Polosa et al.<sup>[98]</sup> Combining 'old' and 'new' drugs and personalising a pharmacological treatment for a

single smoker/patient are also being considered.

A Delphi consensus by leading experts led to an algorithm and guide in 2009 to assist clinicians in prescribing pharmacotherapy for smoking cessation. There appears to be good justification for "off-label" use such as higher doses of NRT or combination therapy in certain circumstances. This practical tool reflects best evidence to date of experts in tobacco cessation.<sup>[99]</sup>

There is little evidence for pharmacotherapy without behavioural support<sup>[100]</sup> and all guidelines recommend drugs should be prescribed alongside behavioural interventions.<sup>[10, 34, 68, 69, 99, 101]</sup>

In summary, effective drugs are available and recommended: NRT, varenicline and bupropion. Overall, pharmacotherapy seems to have efficacy and cost-effectiveness in real life, thus HCPs should become familiar with these medicines.

### E-cigarettes

Battery-powered electronic nicotine delivery devices resembling cigarettes appear increasingly popular. In a prospective proof-of-concept study in 40 healthy smokers not intending to quit, a sustained 50% reduction in the number of cigarettes/day at week-24 was shown in 33% participants; their median of 25 cigs/day decreasing to 6 cigs/day ( $p < 0.001$ ) with 23% achieving sustained smoking abstinence at week-24. Mouth (20.6%) and throat (32.4%) irritation, and dry cough (32.4%) were common, but diminished substantially by week-24.<sup>[102]</sup> The authors suggested that the use of e-cigarettes substantially decreased cigarette consumption without causing significant side effects in smokers not intending to quit (<http://ClinicalTrials.gov> number NCT01195597). However this was a small, open label, non-randomised trial and smokers were selected through advertisements. The same authors provide case-reports only of e-cigarettes being used in recurrent relapsers.<sup>[103]</sup> Although many smokers are apparently using e-cigarettes, their effectiveness is still not known, the dosing and regulation are variable and effects on lung function and longer term adverse effects are unknown. We do not recommend the use of e-cigarettes unless more evidence accrues.

## RECOMMENDATIONS FOR SECONDARY CARE TOBACCO SMOKING CESSATION SERVICES

### General Infrastructure and Personnel

- 1. Each hospital should have a Stop Smoking Champion (preferably a senior member of clinical staff) with a dedicated interest in promoting and embedding a Stop Smoking culture within the organisation at all levels.**

A senior manager of each organisation is identified to work with the clinical champion to establish a Smoke Free Hospital and centralise Stop Smoking as part of their health-promotion. The management team should support the funding and provision of high quality, comprehensive and evidence-based stop smoking services in their hospital.

- 2. All Health Care Professionals should be aware of their Hospital's Smoking Policy.**

### Interventions for cigarette smokers

- 3. All frontline hospital staff should receive Level 1 Stop Smoking training and know how to refer onto a specialist service for those smokers wishing to quit.** This enables them to ask patients whether they smoke or not, and to assess broadly whether the person is interested in help and support to stop. Smoking cessation should be offered to patients at the same place as where their diagnosis is made and other treatment provided. Patients attending out-patient clinics expect to receive treatment from the hospital for their conditions. This is both opportune and natural, especially when there is evidence for the efficacy of such a service. Junior Doctors should routinely (regularly) receive training in smoking cessation and be familiar with pharmacotherapies (particularly NRT for inpatients). Various e-learning modules are available to facilitate this training, including the free upload at the National Centre for Smoking Cessation and Training ([www.ncst.co.uk](http://www.ncst.co.uk)) and uploads available at [brit-thoracic.org](http://brit-thoracic.org).
- 4. The smoking status of all patients should be recorded in their notes at every attendance to the hospital.**

Details of previous quit attempts should also be noted to guide further advice and intervention. The smokers should be made aware of the potential harm from smoking and be informed that the hospital offers help in smoking cessation. A history of cannabis smoking should be considered in all tobacco smokers, particularly younger people who present with severe COPD and bullous emphysema on CT scan or in young people presenting to casualty with a pneumothorax.

- 5. Licensed pharmacotherapy for smoking cessation should be readily available at all times of day in the hospital wards / pharmacy.**

NRT (all modalities) and varenicline (Champix) should be available on hospital formulary and easily accessible from ward and/or pharmacy stocks. Patients in hospital who are current smokers should be offered and encouraged to accept NRT or varenicline (with support from the Hospital Smoking Cessation Practitioner (HSCP)) to alleviate withdrawal whilst in a smoke-free hospital.

- 6. Smoking cessation interventions and pharmacotherapy should be recorded in notes and discharge summaries as a medical intervention.**
- 7. There should be a specific post(s) in each hospital designated to specialist smoking cessation counselling.**

This person would provide level 3 service intervention. The HSCP should have a link to a named consultant in the hospital/ Trust, who would ideally be the BTS Stop Smoking Champion for that organisation. Theoretically, any member of staff who has received high level training in smoking cessation can provide the service but it is very important that the appointee has the personal qualities such as good interpersonal skills and is capable of empathic relationships with patients. The success rate of the service depends on the ability of the counsellor to develop a relationship with the patient and to provide appropriate support and encouragement tailored to that individual.

The HSCP should have received maximum (i.e. level 3) training in evidence-based methodology and would preferably have some training/experience in counselling skills. The HSCP should have time to provide some training in brief interventions for other members of staff who can opportunistically apply these to patients.

Non-smoking claims should be validated at least at one and six months, with a further 1 year check if possible, using expired air carbon monoxide (CO) or other objective test.

Successful cessation should be measured as continuous, validated abstinence for at least six months.

Sessions can be one-to-one or as a group, depending on patients' preferences, the counsellors' aptitudes and local circumstances.

Hospitals should routinely offer a full range of nicotine replacement therapies (NRT), varenicline (Champix) and bupropion (Zyban). The counsellor and/or consultant with responsibility for the service should agree with the hospital

pharmacy an efficient way of providing this pharmacotherapy to both outpatients, in-patients and staff who smoke and wish to quit

Provision of Supervision/consultation/support for the HSCS by a senior smoking cessation practitioner colleague or other appropriate professional (e.g. appropriate clinician) should be made available.

Consideration should be given to provision of additional psychological support to supplement a standard quit smoking service, particularly where co-morbid mental health issues, anxiety and depression, or extreme resistance to stopping prevents progress.

The results of the programme should be recorded on standardised national databases which should be complementary to the community smoking cessation service databases.

**8. The HSCS should have a dedicated office, phone, computer (email) and access to all specialities.**

Secretarial support / IT support.

The counsellor should have access to clerical support and relevant communication facilities (office space to admin, a desk, telephone, answer phone, fax and E-mail) and IT support.

Accommodation.

A dedicated (private) room within the hospital is necessary for the counselling sessions.

**9. There should be a named Consultant, Senior Nurse or Hospital Manager (Stop Smoking Champion) responsible for supporting the HSCS.**

**10. The HSCS should offer smokers interested in quitting:**

- **Around 40-60 minutes initial consultation**
- **Weekly follow-up appointments of 10-20 minutes for at least 4 weeks**
- **Phone call contact at 3 and 6 months**
- **Self-reported quitters should be offered a final appointment at 12 months**

**a) Referral arrangements**

Hospital staff should be strongly discouraged in smoking and a hospital smoking cessation practitioner can lead on developing a range of initiatives to ensure hospitals and their grounds go and stay smoke free. All patients and staff who wish to stop

smoking should be referred and/or encouraged to self refer. It is vital that the service operates with very open and flexible referral pathways. All medical and para-medical staff involved in the care of in-patients or out-patients, including those running pre-admission clinics, patients themselves and the family and friends of patients should be able to refer to the service. For this model to be viable the service needs to be publicised around the hospital by posters and leaflets that contain information about smoking and contact details of the smoking cessation programme. The counsellor and/or consultant should regularly inform and remind staff of the existence and value of the service to patients, staff and their families. Parents of paediatric patients should have access to the service.

There needs to be some degree of selection of patients into the service and research supports the recommendation that only those patients who really want to stop smoking should be referred to the programme. Further selection may take place at the initial appointment with the counsellor. Experience has shown that those patients who fail to attend the initial appointment fail because either they never really wanted to stop smoking or they changed their minds about trying to stop.

It is important that the hospital smoking cessation service should have close links with the community cessation service, particularly in rural areas where longer journeys to hospital means it is more practical for smokers to be referred to the community service for help. Close communications with primary care, and keeping GPs informed about their patients' smoking cessation attempts, are important. Hospitals and community services should share common assessments, documentation and management protocols to ensure that the patient perceives that they are receiving consistent care. It is the case that some community-based counsellors are running sessions in the hospital and in this scenario sharing of record-keeping and information should be possible. Further research is needed to help bridge the gap between secondary and community stop smoking services.

Hospitals should actively support their staff smokers to quit with involvement from Occupational Health departments and agreement from human resource / nursing administration that staff members will be allowed time out from their jobs to attend quit smoking appointments during the quit attempt.

**b) Nature and content of the programme**

A flexible approach and the opportunity to tailor appointments to the needs of the individual is ideal. However, there are some key features that should be incorporated into an adaptable model.

- **Initial contact/appointment**

This should be of sufficient duration to enable the counsellor to take full details of the patient's smoking history including previous quit attempts (number and type of intervention used), medical history, motivation levels and support network, and to explain the details of the programme on offer. Ideally, this should be a one-to-one session and typically lasts around 40-60 minutes. Some programmes stress setting a 'quit day' but many services help smokers who have already recently quit (e.g. during their inpatient stay). This seems a reasonable way to go about helping focus motivation to stop, but it is also important to bear in mind that encouraging patients to stop with immediate effect can yield similar results. However, an agreed timescale is useful, and whether this is a planned date or an immediate cessation is up to the counsellor and patient to agree. If a 'quit date' is chosen this should be within a week of this first session. If the patient is being seen in a pre-admission clinic the operation date can provide a useful framework to encourage and motivate the individual and any prompts like this should be explored. Patients should be encouraged to stop suddenly, and not to gradually scale down their smoking because the former is more likely to result in successful, sustained quitting.

- **0-1 month (minimum of 2, but ideally 4, 20 minute appointments)**

In-patients should be seen at least once during their stay in hospital and, on discharge, should know when and where to come for further sessions.

Out-patients should be seen weekly for the first month, as this is a crucial period for success. If weekly is not possible then no more than a fortnight should lapse between the counsellor and patient meeting. At 1 month cessation should be validated, as set out in the Health Development Agency's recommendations to Primary Care Trusts ([www.dh.gov.uk/tobacco](http://www.dh.gov.uk/tobacco)), using expired air carbon monoxide (CO) measurement or other reliable objective test.

The venue for these appointments should, where possible, be flexible, e.g. patients may prefer to come to the hospital, go to a community clinic, be seen at home, etc. Evening appointments may also be more useful to patients. Where resources permit, as many options should be given to the patients as possible. Some services report 'Did not attend' rates of up to 40%, and therefore anything that can be done to reduce these rates has to be explored. If patients fail to turn up to appointments during the first month it is recommended that they be contacted once by telephone and encouraged to attend.

Some services offer just one-to-one sessions, others favour

group sessions (of up to 8-10 participants). This is really a decision for the individual HSCS to make and is largely dependent on their training, smoker's choice and resources e.g. size of room. It would be ideal if both formats could be available.

If the patients are still smoking after 1 month it is unlikely they will succeed at this attempt but an individual approach to further management may be taken at this point, depending on the patient's motivation and wishes.

- **1-3 months (10-20 minute appointments)**

The next two months can be flexible. Ideally, patients will be seen again monthly face-to-face during this time, with the minimum requirement being one or more telephone calls during the time. If patients are seen at 3 months non-smoking claims should be verified by expired air CO or other test. It is important that the clinic operates an open-door policy which allows patients to make contact as and when they need support.

- **3-6 months**

Those who still have not smoked are the main focus of attention. Further support can be planned, for example monthly telephone calls or follow-up face-to-face visits if preferred.

- **6-12 months**

At 6 months patients should be seen and cessation should be validated using expired air CO or other test. Once someone has stopped smoking for 6 months the indications are that they will be successful, as few patients will start again having got to this point. Ideally, cessation should be validated again at 12 months at a final encounter.

- **Support / advice offered**

While the amount of information a patient will want and the amount of support they require will vary from individual to individual, it is important that all patients receive key facts about smoking, effects on health and lifestyle and ideas as to how they can help themselves. There are a number of approaches that can be employed, e.g. one-to-one sessions, group sessions, buddy systems, etc. However the evidence for the relative success of each approach is sparse. It is more important to offer a range of services to suit patients' preferences and for counsellors to be working in environments that suit their skills and enables them to provide the best possible support to patients. Good communication between the hospital counsellors and counsellors/groups running in the community is vital. It is not necessarily useful for the hospital to run group sessions, but if an individual patient feels he/she would benefit it is important for the counsellor to be able to recommend whom to contact.



### 11. The HSCP should be able to prescribe or recommend medications so that all patients and staff who want to quit have timely access to all licensed pharmacotherapies

All hospitals should offer NRT (ideally all forms) and Varenicline (Champix) and Bupropion should be available. NRT should be offered for up to 3 months but could be offered for longer with clinician support, particularly for the most 'resistant' smokers with high nicotine addiction.

The HSCP, and/or consultant with responsibility for the service, should agree with the hospital pharmacy an efficient way of providing NRT and bupropion.

### 12. The HSCP-led service should be flexible.

Some smokers should be able to receive more intensive (e.g. weekly review for 2 months) and prolonged support / pharmacotherapy.

### 13. Smoking status should be validated at each visit to the smoking cessation programme (usually by exhaled carbon monoxide).

The results of the programme must be recorded for audit and a standard UK database should be developed allowing analysis of large data.

The most important outcome measure is the number of patients who claim not to be smoking at 1 month and also at 6 months (ideally also at 12 months) and who state that they have not smoked between these appointments and whose claims at those time points are validated by expired air CO. In addition, records (computerised and/or manual) should be kept of the overall number referred, the number who do not complete the programme, the various diagnoses, age, sex and pharmacological aides used. These data may help refine the service in relation to resources and demand.

## The wider role of a hospital service (training, local policies)

A Hospital Smoking Cessation Steering Committee is desirable for each Trust. This should incorporate the HSCP, Senior Manager responsible for Smoking Cessation and Smoke Free Hospital Policy, the smoking cessation practitioner(s), representatives from the community smoking cessation services, clinicians representing surgery, paediatrics, women's services and surgery, as well as Security and Hospital Volunteers' services.

Health Care Professionals (HCPs) who become involved in tobacco control issues can also alter the environmental influences on their patients in addition to encouraging

individuals to quit. HCPs can help create a smoke-free health care facility in their own institution, and reports suggest that physicians who take such steps to alter the environment of smokers beyond the office are likely to magnify the effect of their work with individual patients who smoke.<sup>[104]</sup>

Lobbying by senior hospital managers and clinicians has been shown to lead to an increase in active hospital smoking cessation clinics (consisting of a specialist and at least 1 specially trained doctor) from 21% to 50% of hospitals in Switzerland in 2006.<sup>[105]</sup>

On-going training/support for HSCS is necessary. A forum for practitioners to meet, to share ideas and experience, to standardise and optimise practice should be encouraged. Any forum of this kind should be open to those working in hospital settings and also their colleagues in the community.

The BTS Stop Smoking Champions forum (online and through annual meetings) should provide mutual support for Champions.

In summary we agree with many others that

***'efficacious inpatient smoking programmes have been developed and validated. The challenge now is to translate these interventions more widely into practice, given the changing hospitalisation patterns.'***<sup>[106]</sup>



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