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Knowledge gaps about smoking cessation in hospitalized patients and their doctors

Tobias Raupach¹, Jacqueline Merker¹, Gerd Hasenfuß¹, Stefan Andreas² and Andrew Pipe³

Abstract

Background: Hospitalization is an opportune time for smoking cessation support; cessation interventions delivered by hospital physicians are effective. While general practitioners' and outpatients' knowledge and attitudes towards smoking cessation have been studied in great detail, in-patient cessation programmes have received less attention.

Design: Questionnaire-based survey of a convenience sample of hospital physicians and in-patients at Göttingen University Hospital, Germany.

Methods: All 159 physicians directly involved in bedside care on medical and surgical wards received a three-page questionnaire examining smoking status, knowledge of smoking-attributable morbidity and mortality, and their understanding of the effectiveness of methods to achieve long-term smoking cessation. Perceived barriers to the delivery of counselling and cessation services to smoking patients were identified. One thousand randomly selected patients on medical (N = 400) and surgical (N = 600) wards were invited to complete a similar questionnaire.

Results: Seventy-seven physicians (response rate 48.4%) and 675 patients (67.5%) completed the questionnaire. Patients and physicians alike underestimated the smoking-attributable risk of developing smoking-related cancers and chronic obstructive lung disease. In addition, severe misperceptions regarding the effectiveness of cessation methods were noted in both populations with 'willpower' being thought to be most effective in achieving abstinence. Only one-third of smoking patients recalled having been counselled to quit. Physicians identified lack of time as a central barrier to counselling smoking patients.

Conclusions: These findings suggest that hospitalized smokers in a large German university hospital might not be treated according to international guidelines.

Keywords

Counselling, hospital, physicians, smoking, smoking cessation

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Introduction

Decreasing smoking prevalence is among the most effective interventions to reduce morbidity and mortality.¹ Physicians play a crucial role in advising and assisting smokers to quit. While current guidelines² provide clear recommendations for the care of smoking patients, a recent international survey of 2800 general and family practitioners³ revealed that only 40% of physicians discussed smoking with their patients at each visit. While the primary care physician's role in counselling smoking patients is well accepted, advising hospitalized smokers to quit is equally important.⁴ Many hospitalized patients are admitted as a consequence of smoking-related disease, and hospitalization provides a unique opportunity to identify smokers and

initiate a cessation attempt.⁵ Such interventions can dramatically reduce rates of readmission and all-cause mortality.⁶ Very few studies have assessed the extent to which hospitalized patients are being screened for their smoking status and, when appropriate, being provided with adequate cessation advice and support. Similarly,

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hospital physicians' views and skills with regard to the management of hospitalized patients who smoke have not been studied in great detail.

In order to identify central barriers to the implementation of current guidelines on smoking cessation in hospitalized patients, this study assessed views on smoking and perceptions of the effectiveness of various methods to achieve long-term abstinence in both hospitalized patients and their attending physicians.

Methods

Two similar self-administered questionnaires assessing smoking status and nicotine dependence (Fagerström Test of Nicotine Dependence, FTND⁷), knowledge regarding tobacco constituents that can cause coronary artery disease, as well as the effectiveness of various smoking cessation methods, were created and distributed to physicians and in-patients at Göttingen University Hospital in Germany. The questionnaires were modified from a survey tool used in a previous study.⁸

The physician survey contained additional open-ended questions on smoking-related mortality⁹ as well as dichotomous questions on routine behaviour ('Do you routinely capture your patients' smoking status?', 'Do you routinely advise all smokers to quit?'). In addition, physicians were asked to indicate any reasons for not advising all smoking patients to quit. Options were derived from previous studies assessing treatment barriers in GPs.^{3,10,11} In-patients were asked whether their physician had discussed smoking with them during their current hospital stay.

Both physicians and patients were asked to provide estimates of smoking-attributable fractions (SAF; i.e. the percentage of all cases of a specific disease caused by smoking) of various diseases using an 11-point Likert scale (0–100%). Responses were compared to published SAF estimates^{12,13} for each specific disease and categorized as within the published reference range or as underestimates and overestimates for values below and above the reference range, respectively. The perceived effectiveness of several smoking cessation methods was assessed on a four-point scale anchored by 1 ('very effective') and 4 ('ineffective'). In the text accompanying this question, methods were defined as being 'very effective' if they yielded 12-month continuous abstinence rates of 30%.

The physician questionnaire was sent to all 159 physicians directly involved in in-patient care on surgical and medical wards as well as in diagnostic units (surgery: 71 physicians, internal medicine: 88 physicians). Physicians were asked to return completed questionnaires within four weeks. The patient questionnaire was given to patients treated on surgical and medical

wards, excluding critically ill patients and those unable to read and/or write. The survey was completed in four waves, each one month apart. Six medical wards accommodating a maximum of 120 patients and nine surgical wards with a maximum capacity of 180 beds participated in the study; thus, during each wave, approximately 300 patients were screened, of which 16.7% were not found eligible for study participation (critically ill or unable to read/write). Based on a pilot study assessing questionnaire comprehensibility and patient eligibility rates, our goal was to approach a total of 1000 eligible patients (400 medical, 600 surgical). Questionnaire distribution was terminated as soon as this goal was met.

Questionnaires were collected from patients on the same day they had been distributed. They were scanned with full-text answers being entered manually. Data analysis was performed using SPSS 14.0 (SPSS Inc., Chicago, Illinois). Data are presented as proportions or median (range), respectively. Patient response rates are expressed as the proportion of eligible patients who volunteered to complete the questionnaire. Between-group comparisons of dichotomous and continuous variables were performed using χ^2 tests and Mann-Whitney-U tests, respectively. The study protocol was approved by the local Institutional Review Board of the University Hospital Göttingen (proposal no. 15/3/06).

Results

Response rates and subject characteristics

A total of 77 physicians (medical = 32; surgical = 45) returned a completed questionnaire (overall response rate: 48.4%). One in three physicians (31.2%) was female; age ranged from 27–61 with a median of 34.0 years. Patient participation rates differed substantially between medical (54.0%; N = 216) and surgical wards (76.5%; N = 459). While there was no difference in the proportion of female patients in both samples (45.8% and 50.6%, respectively), patients treated on medical wards were significantly older (median 62.5 years; range 18–90 years) than those on surgical wards (median 47.0; range 18–91 years; $p < 0.001$).

Only seven doctors (9.1%) identified themselves as smokers. Overall smoking prevalence among patients was 33.0% (medical wards: 23.6%; surgical wards: 37.5%; $p < 0.001$). Just over half (50.6%) of all 223 smoking patients scored an FTND value > 5 , indicating a high level of nicotine dependence; a similar proportion (50.2%) stated that they wished to give up smoking. One in five (19.3%) had made previous quit attempts.

Table 1. Substances in tobacco smoke believed to cause coronary heart disease. Participants' replies to the open-ended question 'In your opinion, what component of tobacco smoke is mainly responsible for the increased risk of coronary artery disease in smokers?' were grouped into six categories which were mutually exclusive

Substance	Percentage and number of entries	
	Physicians (%) (N = 77)	Patients (%) (N = 675)
Nicotine	36.4 (28)	32.7 (221)
Tar	20.8 (16)	39.6 (267)
Nicotine + tar	0	13.0 (88)
Carbon monoxide	3.9 (3)	1.5 (10)
Mixture of numerous substances	14.3 (11)	1.2 (8)
Other single substances	6.5 (5)	4.1 (28)
No entry (missing values)	18.2 (14)	7.9 (53)

Tobacco toxins and smoking-related morbidity and mortality

The number of substances contained in tobacco smoke (>4,000) was underestimated by most physicians (median 100, range 10–5000) with 85.8% providing an estimate below 3,000. Some 31.2% of physicians underestimated the annual number of smoking-related deaths in Germany (100,000–140,000⁹). When asked about the tobacco smoke constituent causing coronary artery disease, both physicians and patients explicitly mentioned tar, carbon monoxide and other single substances (see Table 1). More physicians (36.4%) than patients (32.7%; $p=0.522$) volunteered the erroneous notion that smoking-attributable coronary artery disease is caused by nicotine alone.

Patients' and physicians' estimates of smoking-attributable fractions of various diseases are displayed in Figure 1. While significantly more patients than

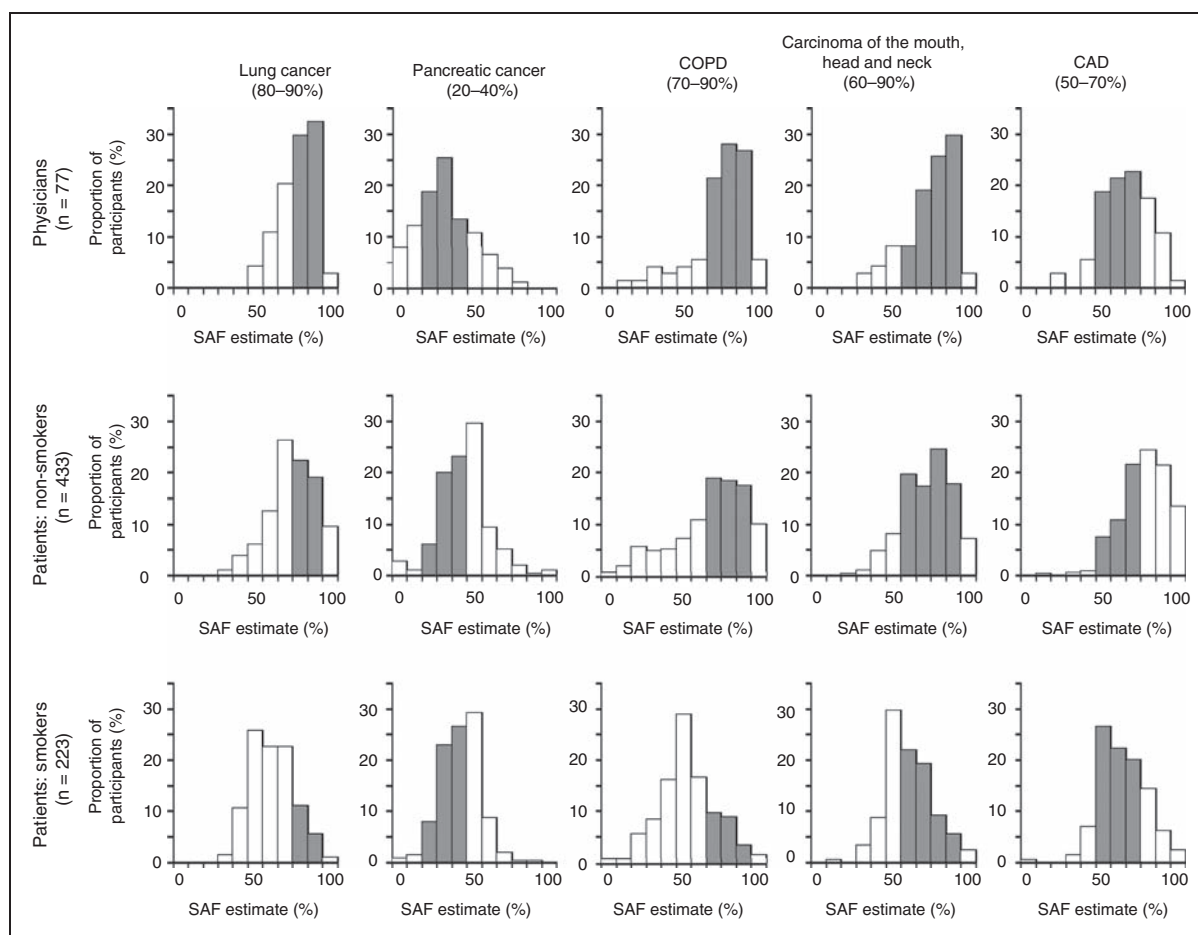


Figure 1. Patients' and physicians' estimates of smoking-attributable fractions of various diseases.

Figures given in brackets and grey columns within histograms refer to reference ranges derived from the literature^{12,13} for each disease. COPD = chronic-obstructive pulmonary disease; CAD = coronary artery disease; SAF = smoking-attributable fraction. 19 patients did not indicate their smoking status.

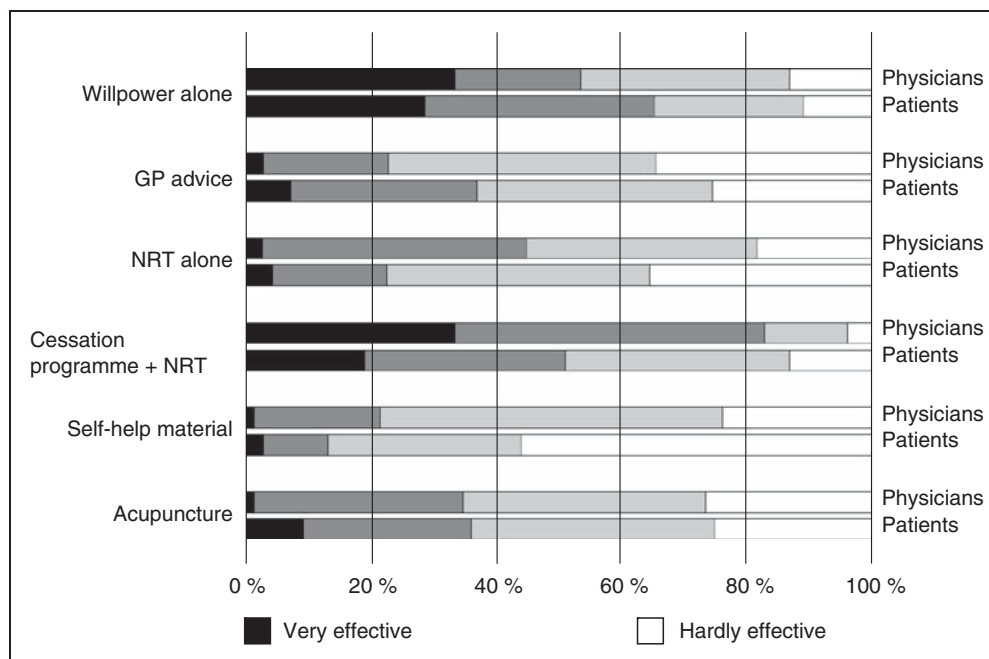


Figure 2. Hospital physicians' and patients' perceptions of the long-term effectiveness of different approaches to smoking cessation. Survey participants rated effectiveness on a four-point Likert scale with high effectiveness being defined as a continuous abstinence rate of 30% after one year. Black bars = high effectiveness; white bars = low effectiveness. NRT = nicotine replacement therapy; GP = general practitioner.

physicians underestimated the smoking-related risk of developing lung cancer and chronic-obstructive pulmonary disease, patients' views were more realistic than physicians' SAF estimates for pancreatic cancer. Proportions of patients underestimating smoking-related disease risk were similar on medical and surgical wards except for chronic-obstructive pulmonary disease: SAF was underestimated by significantly more surgical than medical patients (54.3% vs. 40.8%; $p < 0.001$).

Perceived effectiveness of cessation interventions

Physicians' and patients' beliefs about the long-term effectiveness of various cessation methods are displayed in Figure 2. The majority of both groups believed that 'willpower' was an effective way to give up smoking for good. Although most physicians were aware of the increased effectiveness of comprehensive smoking cessation programmes including pharmacotherapy, they believed that counselling provided by GPs was less effective than acupuncture although the latter has never been found to increase long-term quit rates.¹⁴ Patients' views were more realistic than their physicians' estimates regarding the limited effectiveness of self-help material. On the other hand, patients severely underestimated the effectiveness of nicotine replacement therapy and comprehensive cessation programmes. As noted in Table 2, patients on medical

wards and smoking patients were most pessimistic about the effectiveness of GP advice, pharmacological treatment and comprehensive cessation programmes.

Guideline adherence and treatment barriers

The vast majority of physicians (98.7%) agreed that a patient's smoking status should be captured at every visit, and 93.5% stated that they routinely adhered to this guideline recommendation.² Accordingly, 89.5% of the patients surveyed remembered having been asked about their smoking status during their current in-hospital treatment. However, while 93.5% of physicians thought that all smokers should be advised to quit, the proportion of doctors reporting doing so was only 27.3%. Among smoking patients, 38.6% remembered having been advised to stop smoking during their current hospital stay. This proportion was significantly lower among patients admitted to medical wards than those on surgical wards (21.6% vs. 43.6%; $p = 0.009$). Perceived barriers against advising every smoking patient to quit as indicated by physicians are given in Table 3.

Discussion

Assisting smoking patients with cessation is among the most powerful clinical interventions to reduce cardiovascular morbidity and mortality. The benefit of

Table 2. Proportion of patients ascribing high or very high effectiveness (options 1 and 2 on a 4-point Likert scale) to various smoking cessation methods

Intervention	Percentage and number of patients			
	Medical wards (%) (N = 216)	Surgical wards (%) (N = 459)	Smokers (%) (N = 223)	Non-smokers (%) (N = 433)
Willpower alone	56.9 (123)	64.7 (297)	42.6 (95)	72.7 (315) [§]
GP advice	20.8 (45)	41.6 (191)*	30.9 (69)	37.9 (164)
NRT alone	13.0 (28)	25.3 (116)*	16.6 (37)	23.3 (101) [§]
Cessation programme + NRT	46.3 (100)	49.5 (227)	38.1 (85)	54.3 (235) [§]
Self-help material	4.2 (9)	16.1 (74)*	8.1 (18)	14.5 (63) [§]
Acupuncture	28.7 (62)	36.8 (169)*	27.8 (62)	38.1 (165) [§]

GP, general practitioner; NRT, nicotine replacement therapy. Some 19 patients did not indicate their smoking status. * $p < 0.05$ for comparisons between patients on medical and surgical wards; $§ p < 0.05$ for comparisons between smokers and non-smokers.

Table 3. Perceived barriers against advising smoking patients to quit

Statement	Percentage of entries	Number of entries
I have not received adequate training.	20.0	11
I do not receive adequate reimbursement.	3.6	2
I do not have enough time.	32.7	18
I am not interested.	9.1	5
It is not my responsibility.	32.7	18
no entry (missing values)	30.9	17

Physicians (N = 55) reporting not to counsel every smoker were asked to choose one or more items from a list of five statements derived from the literature.^{3,10,11}

treating hypertension and hyperlipidaemia on cardiovascular risk is outweighed by continued smoking.^{15,16} Stopping smoking reduces platelet aggregation,¹⁷ improves lipid profile¹⁸ and endothelial function,¹⁹ reducing mortality in patients with cardiovascular disease by 36%.²⁰ Primary care and hospital physicians are not only in an ideal position to advise their patients about, and assist with cessation but, from a professional point of view, are also obliged to advise their smoking patients on interventions that will help them quit.²¹ Surveys have repeatedly identified crucial barriers to the implementation of current guidelines on managing smoking patients as perceived by general practitioners; other studies have assessed patient misperceptions of smoking-related disease risk.^{22,23} This is the first study to report attitudes and perceptions towards smoking and cessation methods in a sample of hospital physicians and hospitalized patients in one large teaching hospital. As a result, four central barriers

to the effective implementation of guidelines were identified:

1. an under-estimation of smoking-related disease risk (patients and physicians alike);
2. misperceptions regarding the harmful potential of nicotine (patients and physicians alike);
3. an under-estimation of the effectiveness of various methods to achieve long-term abstinence (patients and physicians alike);
4. a lack of time and sense of clinical responsibility regarding smoking cessation (physicians).

A surprising finding in this study was the relatively large proportion of physicians underestimating the smoking-attributable risk of developing lung cancer, chronic-obstructive pulmonary disease, pancreatic cancer and malignancies of the head and neck. These fundamental misperceptions might hinder physicians from providing appropriate cessation counselling to smoking patients. The present findings confirm earlier reports of smokers underestimating tobacco-related disease risk.²³ While smoking-attributable fractions of coronary artery disease were adequately estimated by most patients in this survey, we detected considerable misperceptions of the risk for developing smoking-related respiratory disorders among both smoking and non-smoking patients. Thus, more intensive and strategic campaigns to raise awareness in the general public as well as more adequate coverage of smoking and smoking-related disease in medical training would seem advisable.

While both patients' and physicians' estimates of smoking-related cardiovascular risk were favourable, their beliefs regarding the harm potential of pure nicotine (Table 1) are surprising. It can be hypothesized that doctors who might inadvertently blame nicotine for the initiation and progression of coronary artery disease

would be likely to withhold nicotine replacement therapy; patients wary of cardiovascular side-effects might reject the use of this effective cessation medication even though its use has been shown to be safe in cardiac patients.²⁴

A recent meta-analysis of studies assessing general and family physicians' views¹⁰ regarding smoking cessation identified specific negative beliefs and attitudes concerning discussing smoking with their patients. In addition to perceiving counselling as being too time-consuming, a substantial number of physicians believed that helping smokers quit was 'not effective'. Our investigation is the first study to obtain patients' and physicians' estimates of the actual effectiveness of various cessation methods. More than 50% of patients and physicians alike ascribed high or very high effectiveness to 'willpower' alone, thus ignoring, or sadly unaware of, the addictive nature of smoking² which, in many cases, necessitates proven behavioural and pharmacological interventions. A reliance on 'willpower' alone may encourage physicians to assign the task of quitting smoking to their patients alone, thereby missing a chance of providing effective counselling. Although physicians acknowledged the effectiveness of comprehensive smoking cessation programmes, they underestimated the effectiveness of such interventions – a similar finding was recently obtained in a sample of 1400 German medical students.⁸ Physicians' low estimates of the effectiveness of nicotine replacement therapy may serve to discourage them from prescribing effective treatments.

The patients surveyed tended to underestimate the effectiveness of GP advice, pharmacotherapy and smoking cessation programmes while overestimating the value of acupuncture and 'willpower' alone. This finding was more pronounced in smokers and patients admitted to medical wards. If these patients receive care from physicians adhering to the same misperceptions, adequate treatment is unlikely to occur.

An encouraging finding of our present study was the strong support of guideline recommendations expressed by the physicians surveyed. More than 90% stated that every patient's smoking status should be obtained, and all hospitalized smokers should be advised to quit. In contrast, the latter recommendation was applied by less than a third of physicians. While lack of reimbursement and training may play a major role in outpatient care,¹¹ the present study suggests that physicians working in a large university clinic suffer from more severe time constraints and – more importantly – do not regard counselling smokers as their responsibility. This misconception needs to be urgently addressed.

Since smokers admitted for a medical as opposed to a surgical condition are least likely to be advised on how to quit and, at the same time, hold most

pessimistic views towards cessation methods of proven effectiveness, this patient group appears to be in greatest need of more thorough education regarding smoking cessation. Physicians caring for patients on medical wards need to be aware of these misperceptions and should seek to improve their skills and to ensure that best-practice approaches to smoking cessation become part of their daily professional practice.²⁵

Limitations of the study

Interpretation of our data is limited by a number of factors: first, smoking status was assessed by means of self-report. The fact that smoking rates found in our patient sample resembled average smoking prevalence in the German population²⁶ renders a substantial underestimation of smoking rates unlikely. The low proportion of smokers found in patients on medical wards which has been observed before in a German sample²⁷ might be due to the fact that patients on medical wards were substantially older than patients on surgical wards and thus might have already stopped smoking. This was an anonymous survey, and patient records were not screened at any point. As a consequence, no information on the type and magnitude of a possible non-response bias is available.

Response rates observed in our patient sample compare favourably to participation rates reported in a recent survey among hospitalized patients.²⁸ However, the percentage and number of physicians returning the questionnaire were rather small, raising doubts about the representativeness of the data obtained from this sample. Although no current data on smoking rates among German hospital physicians are available, smoking prevalence in our physician sample appeared extremely low. Thus, selection bias favouring non-smokers and those interested in the topic of the survey may have occurred. Accordingly, it can be hypothesized that knowledge gaps and misperceptions might be even greater among non-respondents than respondents. Previous studies have shown that hospital physicians' smoking behaviour is associated with smoking-related knowledge, attitudes, and counselling practices.²⁹ The small sample size in the physician survey did not permit a comparison between smokers and non-smokers. Likewise, the sample was too small to assess any differences between physicians associated with medical or surgical departments.

Finally, data obtained from a convenience sample of physicians and patients in one German teaching hospital are unlikely to be representative of Germany as a whole. However, given the paucity of research addressing smoking in hospitalized patients, the data presented here should stimulate further research on this topic.

Conclusion

In order to ensure the implementation of current recommendations for the management of hospitalized smokers,⁴ both patients and physicians need to be better educated about the consequences of smoking, its addictive nature, and effective ways to achieve cessation. Advising smokers to quit and offering effective cessation therapy should be part of every hospital physician's daily routine. The introduction of systematic approaches to the identification and treatment of all smokers admitted to a hospital setting can greatly facilitate such practice.³⁰ The introduction of such approaches to care and the training of physicians and other health professionals in cessation practice can significantly contribute to enhanced patient and community health.

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Conflict of interest

T Raupach and S Andreas have been reimbursed for attendance and lecturing at several Pfizer® symposia on smoking cessation from 2006 through 2010. A Pipe has received research support from, and served as a consultant to, Pfizer®.

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