

The 'Not-a-Puff' rule

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Authors: Lion Shahab and Jennie Kenyon

Editor: Andy McEwen

Reviewers: Susan Michie, Robert West, Jennifer Potts and Melanie Mcllvar

Executive summary

- The 'not-a-puff' rule involves assisting smokers to stop smoking abruptly, commit to not smoking any further cigarettes after the quit date and also to promise to not taking even a single puff on a cigarette from that day forwards
- This briefing provides the rationale and the theoretical and empirical evidence behind this clinical intervention
- The traditional definition of a four-week quit used for stop smoking service returns to the Department of Health is 'continuous abstinence from smoking from day 14 to the four-week follow-up point'. This means that occasional smoking is *permitted* in the first two weeks of the quit attempt but should NOT be interpreted clinically that this is a strategy that is encouraged. Better long-term results are obtained from abrupt cessation and adoption of the 'not-a-puff' rule
- Continued smoking following the quit date prevents resolution of the neuroadaptive changes in the brain that take place upon quitting and leads to prolonged withdrawal symptoms
- The 'habit' element of smoking is not broken whilst a smoker continues to have occasional puffs
- Smoking following the quit date reduces the client's self-efficacy, which only increases through continued abstinence. Self-control, also valuable in quitting, is similarly related to the length of time a client abstains and will not build up if the client continues to smoke
- Empirical studies have shown that lapses are commonly followed by relapses, in up to 95% of cases
- The 'not-a-puff' rule is associated with better outcomes than gradual cessation, in both supported and unsupported quit attempts
- Harm reduction, where continued smoking is permitted with concomitant use of pharmacotherapy (i.e. nicotine replacement therapy; NRT) to reduce consumption, can be recommended for smokers who are unwilling or unable to stop

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1. Introduction

The 'not-a-puff' rule of smoking cessation encourages smokers to quit in an abrupt manner and to not have a single puff on a cigarette following their quit day. This is particularly important given that any smoking after the quit date seriously hampers a client's chances of successfully stopping.

The evidence for abrupt cessation is strong, however alternative models of smoking cessation are emerging, including gradual reduction approaches (with or without accompanying pharmacotherapy) leading to a quit date or those that do not require a specific quit date to be set. Whilst it is important to note that smokers who try to reduce the number of cigarettes that they smoke are more likely to go on and make a quit attempt than those smokers not trying to cut down,¹ it is worth emphasising that this is only a strategy which can lead to a quit attempt and is not a strategy for the quit attempt itself. A review of the evidence on 'nicotine assisted reduction to stop' or 'cut down to quit' can be found elsewhere.^{2,3}

It is also important not to conflate this issue with the harm reduction debate that aims to improve the health of smokers who would not otherwise contemplate cessation.

This review looks at the evidence surrounding the 'not-a-puff' rule in the context of this changing field, considers implications for local data reporting, and makes practice recommendations based on this.

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2. The evidence for the 'not-a-puff' rule

2.1 Background

2.1.1 Definition and prevalence of 'not-a-puff' rule

National guidelines and manuals on smoking cessation⁴⁻⁸ often stress the importance of abrupt over gradual cessation. Meaning that smokers should be encouraged to stop smoking completely rather than be advised to cut down cigarette consumption leading to complete cessation over a period of time. The 'not-a-puff' rule represents the most exact form of abrupt cessation whereby smokers attending stop smoking services are asked not only to commit to not smoking any further cigarettes after the quit date but also to refrain from taking even a single puff on a cigarette from that day onward. This is in contrast to somewhat more lenient definitions that allow smokers up to five cigarettes post quit day to be counted as continuously abstinent.⁴ Whilst direct data on the prevalence of the 'not-a-puff' rule are not available, over a third of English Stop Smoking Service (SSS) explicitly emphasise abrupt cessation in their treatment manuals,⁵ which is likely to include reference to the 'not-a-puff' rule.

2.1.2 Emerging evidence for gradual cessation

In general, abrupt cessation is favoured over gradual cessation for a number of reasons. First, there is good evidence to suggest that cutting cigarette consumption leads to 'compensatory smoking'.⁹ This means that smokers adjust the way they smoke cigarettes, smoking them more intensely and for longer in order to maintain a constant level of nicotine,¹⁰ and thereby remaining exposed to similar levels of toxins.¹¹⁻¹³ Second, data on the impact of gradual reduction on eventual smoking cessation in unaided quit attempts is rather mixed, with only some studies finding a positive effect¹⁴⁻¹⁶ whereas others do not.¹⁷⁻¹⁹ However, there is growing evidence that smokers not intending to stop smoking, who use aids such as nicotine replacement therapy (NRT) whilst reducing cigarette consumption, are more likely to stop smoking than those who do not.²⁰ This group of smokers is unlikely to attend stop smoking services however; for those smokers who do engage with SSS (generally those who have decided to quit) then there is no benefit in advocating cutting down or deferring the quit date.

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2.2 Evidence base

2.2.1 Theoretical research

There are good theoretical reasons why following the 'not-a-puff' rule should be more effective than a more permissive approach to smoking cessation.

At the most basic level, neurobiological research into nicotine addiction has shown that nicotine binds to nicotinic acetylcholine receptors in the mesocorticolimbic dopaminergic system²¹ leading to the release of the reward transmitter dopamine in the nucleus accumbens and the associated extended amygdala,²² both of which influence the acute rewards experienced after ingesting a drug (in this case nicotine).²³ Chronic exposure to nicotine quickly leads to molecular and neurochemical changes in this reward pathway, including a decrease in dopamine release due to desensitisation, which results in the smoker experiencing unpleasant withdrawal symptoms during periods of abstinence.²⁴ However, neuroadaptive changes are reversed following smoking cessation²⁵ and most withdrawal symptoms disappear within a month.²⁶ These neurobiological effects underpin behaviour and can be understood in terms of 'operant learning theory' which involves both positive and negative reinforcement. Smoking leads to the experience of pleasant feelings or reward (positive reinforcement) and the relief of aversive withdrawal symptoms (negative reinforcement). Abstinence is *punished* due to the occurrence of withdrawal symptoms and over time these processes result in dependence.²⁷ In order to overcome this dependence, this cycle of reinforcement and punishment needs to be broken so as to unlearn the behaviour and to allow the neurobiological substrate to revert to its initial state.

In addition, smoking has all the trademarks of a habit; it is frequently performed, mostly automatic and cued by context. Habits are particularly hard to break when there are confounding cues, as is the case with smoking.²⁸ Consistent with this, research suggests that habitual behaviours can lead to unintentional 'slips' in the presence of cues such as other people smoking.²⁹ Thus, everything else being equal, any continued smoking, even a single puff, would risk undermining a quit attempt according to both neurobiological and learning theories.

This conclusion is supported by general psychological and social cognition theories. For instance, it is often observed that when a particular self-imposed rule (e.g. not smoking) is broken once (e.g. having a cigarette), people tend to abandon their behavioural aims (i.e. the quit attempt) rather than carry on trying to stick to the rule. This 'abstinence violation effect' is thought to be the result of the negative emotions, such as guilt and reduced self-efficacy,^{30,31} that the person experienced on breaking their rule. These cognitive changes have been shown to occur in smokers who lapse³² and there is some evidence that this may be associated with progression to relapse,³³ though findings are not always consistent.³⁴

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According to social cognitive theory,^{*35} and dynamic feedback models,^{**36,37} self-efficacy (the belief that somebody has in their ability to carry out a given behaviour) is a pre-requisite for successful behaviour change, and variation in self-efficacy has been shown to predict relapse.³⁸ One way to increase self-efficacy is through mastery experience – the successful engagement in the target behaviour.³⁹ It follows that the longer the behaviour change can be enacted (e.g. going without a cigarette), the greater the resultant perceived self-efficacy for that behaviour and the more the person believes in their ability to make that behaviour change. The inverse is observed for lapses in the behaviour, as has been shown for smoking cessation where self-efficacy has been found to fall following a lapse.⁴⁰ These findings therefore favour complete abstinence, with not a single puff on a cigarette, as an approach which should maintain smoking cessation and to avoid the possibility of the 'abstinence violation effect' which may lead to a full relapse.

Allowing oneself a puff on a cigarette also predicts consequences for self-control. Models of self-regulation and ego-depletion suggest that self-control works like a muscle drawing from common limited resources within the individual. Since smoking cessation is effortful, this model predicts that complete cessation is likely to deplete these resources in the short-term but through repeated exercise (continued abstinence), these resources will be restored and self-control will increase.⁴¹ For this reason, having even a single puff on a cigarette is likely to weaken this 'muscle' and erode self-control, eventually increasing the risk of relapse.

Looking at the bigger picture, integrative theories of motivation such as PRIME theory (www.primetheory.com) also consider the importance of identity, which in turn provides the foundation of personal norms that shape and set boundaries on an individual's behaviour.⁴² It is argued that a sense of self or identity is an important source of motivation. This identity leads to the adoption of rules (e.g. I must not smoke) and the stronger the identity the more likely it is that the individual will overcome competing wants and needs (i.e. going back to smoking).⁴³ It follows that embracing a clear 'not-a-puff' rule enables the formation of a deep non-smoker identity that should be more effective in preventing relapse than a weaker rule such as 'I'm trying not to smoke'. This rationale is supported by research showing that a substantial proportion of quit attempts fail because of the smoker's perception that abstinence can be briefly suspended and resumed again.⁴⁴

* A theory of social learning that explains how people acquire and maintain certain behaviour patterns and the basis for intervention strategies

** Psychological simulation that uses outcome data from prior experience to influence and predict future behaviour

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2.2.2 Empirical research

These theoretical considerations are in part borne out by research evidence. However, it should be noted that there have been no direct comparisons of the 'not-a-puff' rule with other approaches to quitting. Best available evidence mainly derives from trials comparing the efficacy of a gradual approach to smoking cessation with an abrupt approach. Given that abrupt cessation is largely analogous to adopting the 'not-a-puff' rule (as both emphasise complete abstinence, from cigarettes and puffing respectively) this provides a basis for extrapolation.

Research investigating the natural progression of quit attempts from lapse to relapse suggests that a first lapse, such as puffing on a cigarette, almost inevitably progresses to a relapse. This has been found to occur in unsupported as well as supported quit attempts and is not limited to those following a 'not-a-puff' rule.⁴⁵⁻⁴⁸ Estimates can be as high as 95%,⁴⁹ and a first lapse is very quickly followed by a second lapse (Figure 1). Few people are able to overcome this momentum and manage to return to abstinence. This finding is corroborated by reviews of the progression to relapse in unaided quit attempts which suggest that the majority of smokers relapse within a week.⁵⁰ These findings suggest that adopting a strict 'not-a-puff' rule is particularly important for the early part of a quit attempt, as it is early rather than late lapses that are most detrimental to a quit attempt.

Figure 1:
Progression from first to second lapse and relapse

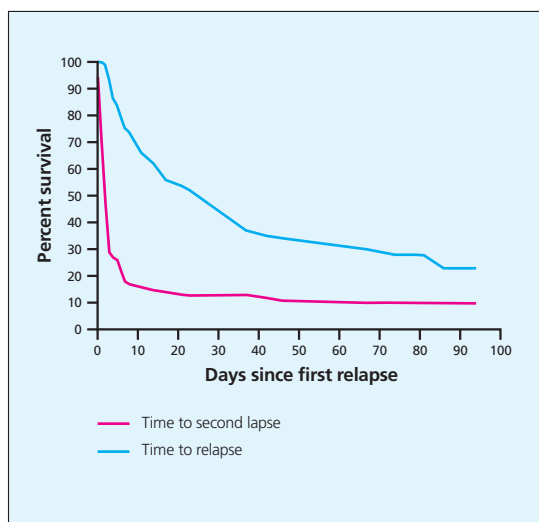
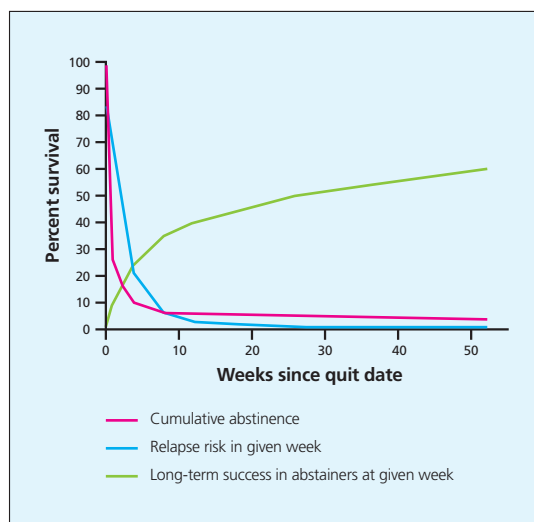


Figure 2:
Relapse and abstinence during unaided quit attempts

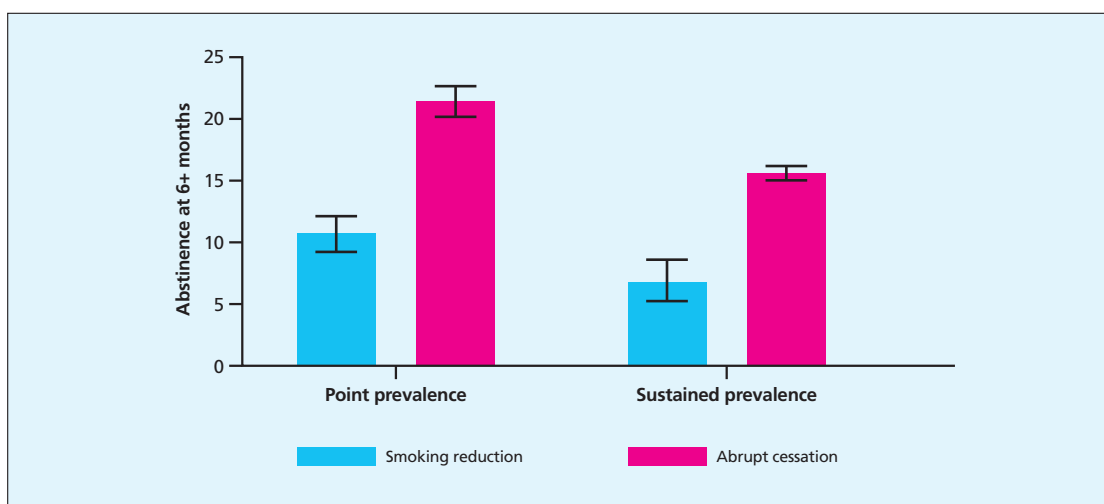


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Studies that have compared the relative efficacy of gradual and abrupt cessation within the context of both aided and unaided quit attempts provide another source of evidence for the 'not-a-puff' rule. Surveys of smokers from the general population who have stopped without any particular pharmacological or behavioural support, have shown that abrupt cessation is nearly twice as likely to lead to long-term abstinence as gradually working towards cessation by cutting down.^{51,52} By contrast, there is no evidence that reducing consumption prior to a set quit date has a detrimental effect on smoking cessation compared with abrupt cessation, irrespective of whether prior reduction is unaided or supported by pharmacotherapy.⁵³ However, even in this scenario, smokers are still encouraged to stop smoking completely following the target quit date.

This differs from where smokers are instructed to reduce their cigarette consumption without being required to set a target quit date. A number of recent reviews have evaluated this approach when provided in conjunction with support.^{20,54,55} The evidence suggests that smokers not motivated to quit who reduce cigarette consumption using NRT are more likely to stop smoking successfully than those who engage in unassisted smoking reduction. However, abstinence rates obtained in these trials are significantly lower than those observed in studies in which NRT is provided to assist abrupt cessation (Figure 3).⁵⁶ It is difficult to compare these results directly due to the different characteristics of smokers included in the studies, in particular their motivation to stop. However, in the absence of randomised controlled trials that assign smokers to smoking reduction or abrupt cessation, these results favour the use of abrupt cessation or a 'not-a-puff' rule over gradual reduction. This interpretation is supported by observational studies of smokers attending stop smoking services that provide attendees with a choice between gradual and abrupt cessation. Results suggest that smokers who opt to stop smoking abruptly are nearly twice as likely to be abstinent at follow-up than smokers choosing gradual cessation.⁵⁷

Figure 3: Abstinence rates using NRT by quit route



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3. Local interpretation of national definitions of quitting and the not-a-puff rule

3.1 Definitions of quitting

3.1.1 The Russell Standard (clinical)

The Russell Standard⁵⁸ sets out the English national standard for monitoring the throughput and success rates of local stop smoking services, allowing meaningful direct comparisons between services. It is based on key definitions:

3.1.1.1 Treated smoker

A 'Treated Smoker' (TS) is a smoker who attends at least one session with a stop smoking practitioner on or prior to the quit date and sets a firm (non-movable) quit date. Smokers who attend an initial appointment but fail to attend thereafter would not be counted, neither would smokers who do not set a quit date. Smokers who have already stopped smoking at the time they first contact the services are similarly not counted.

Note that the latest Department of Health Service and Monitoring Guidance allows data for those who have stopped smoking for less than 48 hours to be submitted as 'spontaneous quitters'.⁴ This was in recognition of certain smoking populations such as hospital inpatients and pregnant women where, in many cases, their first contact with the service will fall after they have stopped smoking.

3.1.1.2 Self-reported four-week quitter

A treated smoker is counted as a self-reported 4-week quitter (SR4WQ) if s/he is assessed (face-to-face, by post, email or telephone) four weeks after the quit date (minus three days or plus 14 days; 25–42 days post quit date) and states that s/he has not smoked even a single puff on a cigarette in the past two weeks.

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3.1.1.3 CO-verified four-week quitter

A treated smoker is counted as a 'CO-verified 4-week quitter' (4WQ) if s/he is a self-reported 4-week quitter and additionally has her/his expired carbon monoxide (CO) measured four weeks after the designated quit date (minus three days or plus 14 days; 25–42 days post quit date) and it is found to be less than 10ppm.

The data required for the local stop smoking service quarterly data submissions to the NHS Information Centre, as described in the Department of Health Service Delivery and Monitoring Guidance,⁴ are based on the Russell Standard. Data needs to be submitted for all treated smokers and clients whose follow-up data fall outside the 25–42 day time span cannot be counted in the stop smoking service return. CO-verification should be conducted face-to-face and should be carried out in at least 85% of self-reported four-week quitters. Cotinine (a metabolite of nicotine) levels can be assessed using postal sample collections if needed.

3.2 Local interpretation

The definition of four-week quitter, where smokers only need to report not smoking even a single puff on a cigarette in the two weeks leading up to their four-week follow-up appointment, is open to confusion and misinterpretation.

Anecdotal evidence indicates that some practitioners, and commissioners and managers of stop smoking services have interpreted this rule as meaning that clients are 'allowed' to smoke in the first two weeks of their quit attempt. This is in direct contrast to the evidence supporting the adoption of the 'not-a-puff' rule and where this is regular practice, the published four-week quit rates of stop smoking services will be misleadingly high as they are really reporting on two-week quit rates.

Additionally, this rule has led to the possibility that some stop smoking practitioners might wait until a client has not smoked for two weeks and then 'backdate' the client's quit date; this is not permitted according to current Department of Health guidance.

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4. Conclusion

The best available theoretical and empirical evidence suggests that the adoption of a strict 'not-a-puff' rule following a set quit date is likely to be more successful than a more lenient rule, where smokers cut down more gradually or are 'allowed' to smoke in the first two weeks of their quit attempt. Theories agree that breaking behavioural goals by having even a puff on a cigarette increases the risk of reinforcing engrained behavioural patterns, maintaining physical dependence and nicotine-dependent changes in the brain as well as undermining cognitive resources and identity formation as a non-smoker.

Whilst direct data assessing the 'not-a-puff' rule are not available, empirical studies show that initial lapses commonly result in relapses and indicate that abrupt cessation, and consequently the 'not-a-puff' rule, is associated with better outcomes than either gradual cessation in unaided quit attempts or gradual reduction in supported quit attempts.

It is important not to conflate this issue with the harm reduction debate that aims to improve the health of smokers who would not otherwise contemplate cessation.⁵⁹ In this case, evidence suggests that smokers may benefit adopting a more lenient approach to cessation if they are also encouraged to use pharmacotherapy, something which is now possible due to recent changes to NRT licensing.⁶⁰ However, this approach is only justified in smokers who are unwilling or unable to stop, in order to reduce their likely risk of continued smoking; it should not be recommended to smokers who are already motivated to quit. For this reason current evidence would support the view that, in the first instance, smokers attending stop smoking services should be encouraged to adopt the 'not-a-puff' rule, stopping smoking completely after the quit date, so as to give themselves the best chance to succeed.

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