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### Nicotine replacement therapy: A blessing in disguise

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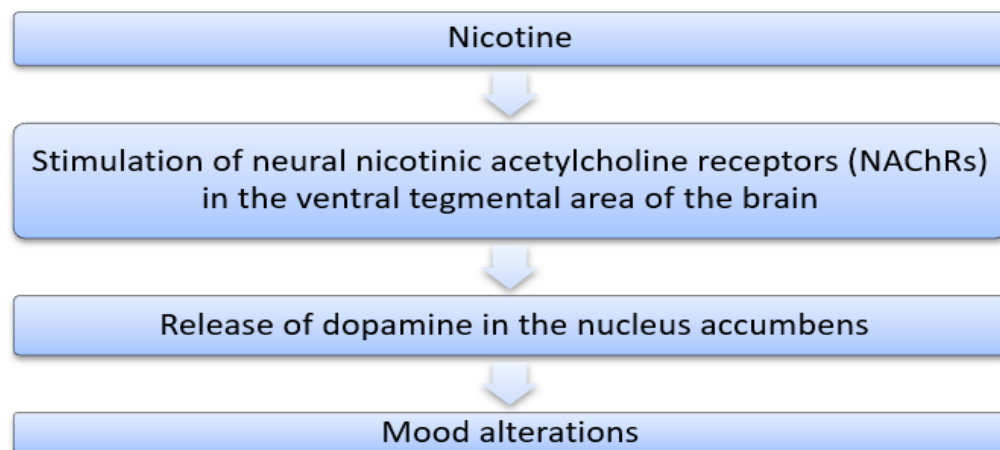
#### Abstract

For much of the 20th century, smoking was regarded as a socially learned habit and as a personal choice. It is only in the past decade or so that the fundamental role of nicotine in sustaining smoking behaviour has begun to be more widely accepted. It is now recognized that cigarette smoking is primarily a manifestation of nicotine addiction and that smokers have individually characteristic preferences for their level of nicotine intake. Smokers regulate the way they puff and inhale to achieve their desired nicotine dose. The link with nicotine addiction does not imply that pharmacological factors drive smoking behaviour in a simple way and to the exclusion of other influences. Social, economic, personal, and political influences all play an important part in determining patterns of smoking prevalence and cessation. Therefore, the aim of this review was to emphasize information about the nicotine replacement therapy.

**Keywords:** Nicotine replacement, 20th century, smoking behaviour

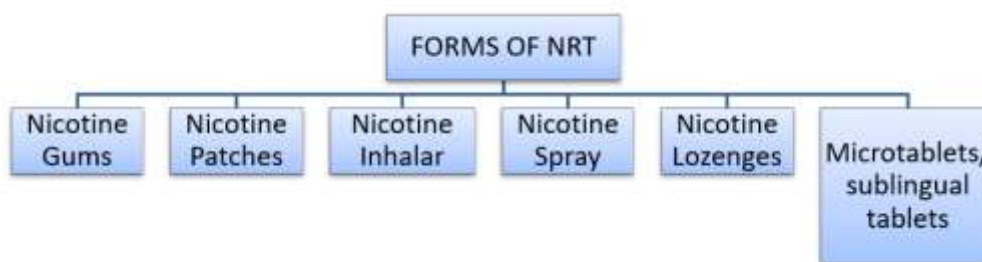
#### Introduction

Nicotine is the highly addictive substance present in tobacco which makes the individuals dependent on tobacco products. Tobacco consumption and withdrawal symptoms associated with nicotine can be reduced with the help of nicotine replacement therapy <sup>[1]</sup>. NRT is also recommended as first line treatment and is very useful in cases of individuals seeking pharmacological measures to stop smoking. In NRT, nicotine is provided in such doses that is not harmful or addictive. Tobacco use is the most prevalent practice followed in rural and urban areas of India. Quitting tobacco is not only beneficial for general health but also improves quality of life further decreasing the rate of morbidity and mortality <sup>[2]</sup>. So, awareness and use of NRT should be promoted and encouraged.



**Fig 1:** Mechanism of action of Nicotine

## Forms of NRT

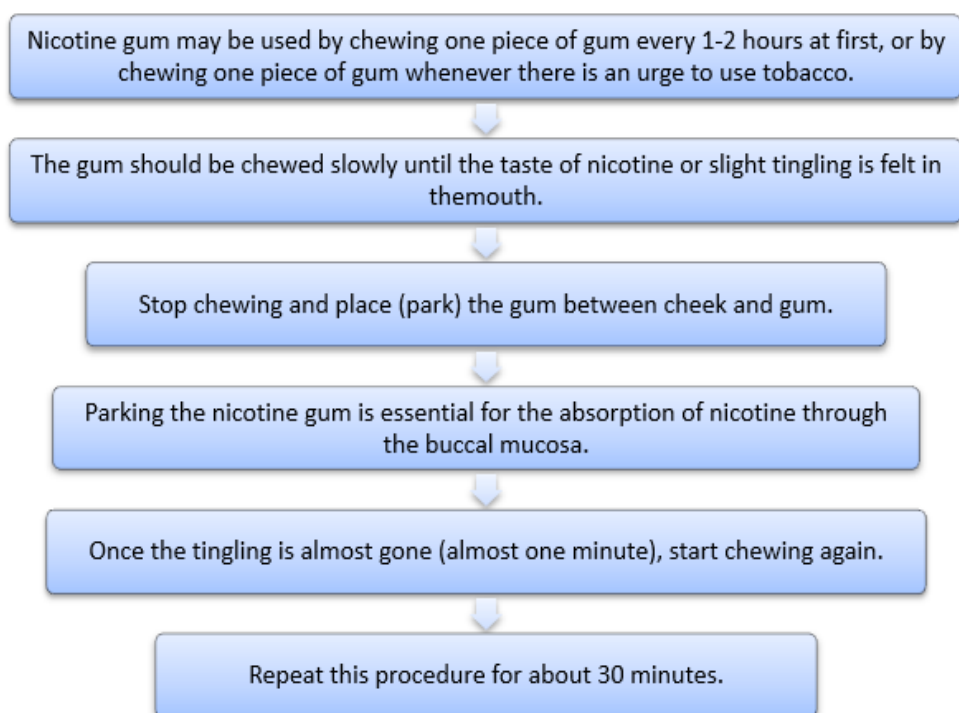


### Nicotine Gums

Nicotine gums are first type of NRT that is widely available and mostly used. The gums are available in 2mg and 4mg doses. 2mg gums are recommended for usual smokers while

4mg are used in cases of heavy smokers<sup>[3]</sup>. The gum is not swallowed but chewed intermittently and held in mouth for about 30 minutes, as required.

Steps to use:



### Nicotine Patches

It is also known as transdermal patch. The nicotine patches are applied over skin to deliver nicotine at relatively steady rate. The nicotine is absorbed through skin and circulated into the bloodstream. The patch is placed mostly during the morning hours rather than actively throughout the day<sup>[4]</sup>. The side effects of these may be local skin reactions which can be overcome by changing the site of application of patches. The advantage of this method is it's easy application and regular release of nicotine. The doses are decreased over time and whole therapy lasts for complete duration of three months<sup>[5]</sup>.

### Nicotine Inhalers

Nicotine in the form of nicotine vapour is inhaled with the help of nicotine inhalation system consisting of plastic cylinder, cartridge and mouth piece. These inhalers provide buccal absorption instead of lung absorption of nicotine<sup>[6]</sup>. The inhaler resembles cigarette in appearance and mode of use. 10mg nicotine is contained in each inhaler in which 4mg is delivered while 2mg can be absorbed following frequent puffing.

### Nicotine Spray

The method which delivers nicotine at fastest rate compared

to other methods. A bottle with pump fitted with a nozzle delivers 0.5 mg of nicotine per 50 uL single spray. Maximum of 40doses/day should not be exceeded. Each dose consists of two sprays, one in each nostril<sup>[7]</sup>.

### Nicotine Lozenges

Lozenges contain nicotine bitartrate dihydrate and are available in 2mg and 4mg doses. These are completely liquefied in oral cavity in 30 minutes. The nicotine is slowly but continuously absorbed in the oral mucosa and is further incorporated into systemic circulation. These are indicated in cases where nicotine gums are not acceptable<sup>8</sup>. The lozenges should not be chewed or swallowed, it should be only sucked until and unless it completely dissolves in mouth. Tablets and lozenges were created for people who do not prefer chewing-gum.

### Microtablets/ Sublingual Tablets

The tablets are placed sublingually and absorbed. The maximum recommended daily dose is 80 mg for 3 months, followed by a gradual reduction in use over the next 3 months for a treatment period of 6 months. These tablets are also available in two forms of 2mg tablets and 4mg tablets<sup>[9]</sup>. Use of carbonated or acidic drinks should be contraindicated

before 15 mins or during the use of lozenges. Minimum duration for use of this product is 3 months<sup>[10]</sup>.

### **NRT and Oral Health**

Dry mouth is one of the most common side effects associated with use of NRT which further alters the buffering capacity of saliva. Other conditions that are associated with implication of NRT are candidiasis, oral mucositis, mouth soreness, taste impairment, dryness, and cracking of the vestibular tissue, and multiple issues for denture wearers as a result of a dry oral cavity including difficulty in speech<sup>[11]</sup>. Due to alteration in saliva, caries status and susceptibility of individual is increased. Nicotine delivered orally may also produce other forms of oral changes leading to discomfort, including numbness and tingling, hyperkeratosis, oral lichenoid reactions, burning mouth syndrome, and localized mucosal irritation<sup>[12]</sup>. Nicotine is a carcinogen and has been shown to modify the progression of oral cancer. Its consumption through an NRT product orally may place a patient at risk of oral neoplastic changes.

### **Role of Dental Professionals**

The dental professionals should have vast and accurate knowledge on NRT and its implications on oral health so that they can plan their treatment likewise and moreover risk factors should be minimized or eliminated<sup>[13]</sup>. As use of tobacco in both the forms, smoking as well as chew/dip forms (smokeless tobacco) is injurious to general health as well as oral health. There are numerous oral lesions associated with tobacco consumption. So dentists play a major role in identifying such lesions and counseling the patients to quit tobacco and further encourage them to follow with the treatment of NRT which will not only help them improve their general as well as oral health but would also have beneficial effects on the quality of life<sup>[14]</sup>. Dentists can play as role models by educating the public about this NRT and its beneficial effects, they can also set an example of themselves by quitting tobacco and encourage the patients to do the same.

### **Patient Compliance with Nrt**

Poor compliance of patient is due to the misinformation about NRT. Most of the patients think of quitting the therapy prematurely which leads to poor compliance of NRT<sup>[15]</sup>. After few doses when the craving and withdrawal symptoms seems to be in control the patients quit this therapy thinking no more treatment is required. The other reasons that lead to poor compliance are cost effectiveness, less awareness and knowledge about NRT<sup>[16]</sup>. Many patients do also have attitude and belief that they will be able to quit tobacco on their own, this also adds to one of the major reason for poor compliance of patients with NRT.

### **Conclusion**

NRT causes minimal adverse effects and proves to be very beneficial method in cessation of tobacco. The clinicians should be well-versed with all the forms of NRT so that appropriate methods should be indicated based on person's need, tolerability and cost considerations<sup>[17]</sup>. Furthermore, choice of NRT should be based on the tobacco consumption habit and patient's preferences. It is believed that there's 50% to 60% increased rate of quitting with the use of NRT. The systemic nicotine load in individuals undergoing replacement therapy is generally lower than during active smoking<sup>[18]</sup>. Nicotine is only one of many thousands of constituents of tobacco smoke<sup>[19]</sup>. Furthermore, nicotine replacement is

usually delivered over the short term (a matter of weeks). Therefore, nicotine replacement is recognized as a relatively safe and effective aid to smoking cessation.

### **Public Health Benefit of NRT**

Tobacco dependence is a menace. It causes a huge toll on health (dental as well) and resources of the nation. It is a global epidemic and poses a substantial threat health burden and costs.

NRT can go a long way in decreasing the deaths due to tobacco. Its positive effects on cessation rate in smokers dependent on nicotine have been well documented as well as cost-effectiveness of its use, leading also to a reduction in cigarette sales.

NRT aids in reducing the withdrawal symptoms experienced on quitting tobacco and is proven as a cost-effective and relatively faster means of tobacco cessation. It is a boon for heavy smokers and is widely recommended due to its wide availability and low price<sup>[20]</sup>.

It is considered a relatively safer drug to be used in all age groups and even in people having psychiatric problems.

### **Recommendations**

An unplanned strategy to quit tobacco leads to low success rates of NRT. The benefits of NRT should be advertised and people should be made aware of the all the NRT products available. The products should be easily available to the community. The problem of tobacco consumption should be ruled out at both the individual level and community level. Though the prices of some of the products are high so it should be brought down by collaborating the work of public and private sectors. Free samples of NRT products must be made available at Tobacco cessation centres and cancer hospitals. Cessation plan or strategies should be made.

### **References**

1. Jarvis MJ. ABC of smoking cessation. Why people smoke. *BMJ* 2004;328(38):277-79.
2. Tobacco Dependence Treatment Guidelines. National Tobacco Control Programme Directorate General of Health Services Ministry of Health & Family Welfare Government of India.
3. Davis, Ronald M *et al.* (eds.) *The Health Consequences of Smoking: Nicotine Addiction: A Report of the Surgeon General*, US 1988 <http://profiles.nlm.nih.gov/NN/B/B/Z/D/> Accessed 14January, 2011).
4. Hatsukami DK, Hughes JR, Pickens RW, Svikis D. Tobacco withdrawal symptoms: an experimental analysis. *Psychopharmacology* 1984;84:231-36.
5. Benowitz NL. Pharmacologic aspects of cigarette smoking and nicotine addiction. *New Engl J Med* 1988; 319(20):1318-30.
6. Shapiro JA, Jacobs EJ, Thun MJ. Cigar smoking in men and risk of death from tobacco-related cancers. *J Natl Cancer Inst* 2000;92:333-7.
7. Jacobs EJ, Thun MJ, Apicella LF. Cigar smoking and death from coronary heart disease in a prospective study of US men. *Arch Intern Med* 1999;159:2413-8.
8. Gupta PC, Ray CS. Smokeless tobacco and health in India and South Asia. *Respirology* 2003;8:419-31.
9. Stratton K, Shetty P, Wallace R, *et al.* *Clearing the smoke*. Washington DC: Institute of Medicine 2001.
10. Fagerstrom *et al.* Aiding reduction of smoking with nicotine replacement medications: hope for the

- recalcitrant smoker. *Tobacco Control* 1997;6:311-6.
11. Shiffman *et al.* Public Health Benefit of over the counter nicotine medications. *Tobacco Control* 1997;6:306-10.
  12. Hughes JR, Hatsukami DK, Skoog KP. Physical dependence on nicotine in gum. A placebo substitution trial. *JAMA* 1986;255:3277-9.
  13. Leischow SJ. Nicotine vaporiser: review of results. Future directions in nicotine replacement therapy. Chester, UK: Adis 1994, 99-103.
  14. Schneider NG, Olmstead RE, Franzon MA *et al.* The nicotine inhaler: clinical pharmacokinetics and comparison with other nicotine treatments. *Clin Pharmacokinet* 2001;40:661-84.
  15. Benowitz NL. Nicotine replacement therapy: what has been accomplished-can we do better? *Drugs* 1993;45:157-70.
  16. Fiore MC, Jorenby DE, Baker TB *et al.* Tobacco dependence and the nicotine patch: clinical guidelines for effective use. *JAMA* 1992;268:2687-94.
  17. Hatsukami D, Mooney M, Murphy S, LeSage M, Babb D, Hecht S. Effects of High Dose Transdermal Nicotine Replacement in Cigarette Smokers. *Pharmacol Biochem Behav* 2007;86(1):132-39.
  18. Kraiczi H, Hansson A, Perfekt R. Single-dose pharmacokinetics of nicotine with a novel mouth spray form of nicotine replacement therapy. *Nic Tob Res* 2011;13:1176-82.
  19. Etter JF, Perneger TV. Attitudes toward nicotine replacement therapy in smokers and ex-smokers in the general public. *Clin Pharmacol Ther* 2001;69:175-83.
  20. Silagy C, Lancaster T, Stead L, *et al.* Nicotine replacement therapy for smoking cessation. The Cochrane Library, Issue 4. Oxford: Updated Software 2002.