



## NICOTINE REPLACEMENT THERAPY- EFFECTIVE TOOL IN SMOKING CESSATION: A SHORT REVIEW

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**ABSTRACT**

Cigarette smoking, a leading cause of morbidity and mortality, is associated with cardiovascular and respiratory diseases, cancer and stroke. Smokers are often neglected and not offered effective assistance with quitting their habits. Among treatment available in society, pharmacotherapeutically nicotine replacement therapy (NRT) is an important component of efficacious tobacco use interventions. NRT is available in many formulations, helps smokers during the withdrawal process by replacing a proportion of the nicotine formerly obtained from cigarettes. Here we focus a small review for the use of NRT in smoking cessation.

**KEYWORDS** : Smoking,Cessation,Nicotine Replacement Therapy**INTRODUCTION**

Today tobacco use is the single greatest preventable cause of death in the world. Tobacco use is often incorrectly perceived to be solely a personal choice. Nicotine is the main active ingredient in tobacco products that reinforces individual to tobacco addiction behavior, it is tobacco's other components which cause widespread mortality and morbidity.<sup>1,2</sup> The World Health Organization (WHO) reported that cigarette smoking presently kills up to four million people annually and that, by the year 2030, up to 10 million smokers will die annually worldwide.<sup>2</sup> Although almost all of the toxicity of smoking is attributed to other components in cigarettes, it is the pharmacological effects of nicotine that lead to tobacco addiction.<sup>1</sup> Patients who smoke cigarettes are at increased risk for development of complications both during and after surgical procedures, including respiratory, cardiac, and healing-related complications.<sup>2,3</sup> Nicotine is the main alkaloid of tobacco smoke and the principal modulator of the psychopharmacological effects associated with addiction.<sup>1</sup> Hence, pharmacological interventions for tobacco cessation continue to emerge with new inventions to our knowledge of the neurochemical basis of nicotine addiction.<sup>1,2,3</sup> Nicotine replacement therapy(NRT) aims to motivate to reduce the consumption of Tobacco, helps to stop smoking and the physiological and psychomotor withdrawal symptoms through delivery of nicotine.<sup>1,2,3,4</sup>

**MECHANISM OF ACTION AND PHARMACOKINETICS**

Nicotine inhaled from cigarette smoke is easily absorbed over the

large surface area of the lungs and is transported directly to the brain via the pulmonary venous system in 10–20 seconds. Nicotine acts as a full agonist on nicotinic acetylcholine receptors in the autonomic ganglia and CNS.<sup>4,5</sup> It has stimulant properties and enhances rewarding effects by increasing downstream release of dopamine in the ventral tegmentum of the midbrain. Nicotinic acetylcholine receptors become desensitized when nicotine levels in the brain are high and then resensitize, leading to withdrawal effects, as nicotine levels fall. Nicotine replacement therapies assist with smoking cessation by stabilizing nicotine levels in the blood, thereby reducing both the positive and negative reinforcing effects nicotine.<sup>3,4,5</sup>

**NICOTINE REPLACEMENT THERAPY**

Nicotine-replacement therapy (NRT) acts as a first-line treatment for smokers seeking pharmacological treatment to stop smoking.<sup>5,6,7</sup> Nicotine-replacement therapy NRT helps smokers to alleviate withdrawal symptoms associated with smoking cessation by replacing a proportion of the nicotine formerly obtained from cigarettes.<sup>6,7,8</sup> Various forms of NRT are available in market such as chewing gum,transdermal patches, nasal sprays, an inhaler, sublingual tablets and lozenges.<sup>8,9,10</sup> NRT can be started without any guidance but the dose of NRT required for individual smokers depends on the nicotine consumption amount and the form and strength of nicotine content. NRT formulations are described below [Table-1].<sup>2,4,6,7,8</sup>

**Table -1 : Various formulations of NRT and their doses**

NRT formulation	Dose	Side effect
Nicotine gum	2-mg or 4-mg per piece 4-mg gum is for patients smoking $\geq 25$ cigarettes daily Use at least one piece every 1–2 hours as needed up to 12 weeks. Maximum: 24 pieces per day	<ul style="list-style-type: none"> <li>• Mouth soreness,</li> <li>• Hiccups,</li> <li>• Dyspepsia,</li> <li>• Jaw ache.</li> </ul>
Transdermal patches	7mg ,14mg, and 21mg as per requirement	<ul style="list-style-type: none"> <li>• Local skin reaction</li> <li>• Insomnia</li> </ul>
Nasal sprays	0.5-mg dose delivered to each nostril (1 mg total) Start at 1–2 doses per hour, increasing until symptom relief Recommended range of 8–40 doses per day for 3–6 months	<ul style="list-style-type: none"> <li>• Nasal irritation</li> <li>• Nasal congestion</li> <li>• Alter sense of smell</li> </ul>
Inhalers	A cartridge delivers 4 mg of nicotine over approximately 80 inhalations Recommended dosage is 6–16 cartridges/day Recommended duration up to 6 months, with taper over in the final 3 months	<ul style="list-style-type: none"> <li>• Local irritation to oral cavity</li> <li>• Coughing</li> <li>• Rhinitis</li> </ul>
Lozenges	2-mg or 4-mg per piece 4-mg lozenge is recommended for patients who smoke their first cigarette within 30 minutes of waking Use at least nine lozenges per day in the first 6 weeks and up to 12 weeks Maximum: 20 per day	<ul style="list-style-type: none"> <li>• Nausea</li> <li>• Hiccups</li> <li>• Heartburn</li> <li>• Coughing</li> <li>• Irritation to oral cavity</li> </ul>
Nicotine sublingual tablet	2mg min of 12 weeks	<ul style="list-style-type: none"> <li>• Irritation of oral cavity</li> </ul>

**ACQUIESCENCE OF NICOTINE REPLACEMENT THERAPY**

Nicotine replacement therapy increases the efficacy of tobacco use interventions; increasing the likelihood that patients can maintain abstinence from smoking.<sup>3,4</sup> Most of NRT users discontinue treatment prematurely. Various factors are responsible for poor acquiescence of NRT, such as safety, addiction to NRT, lack of self confidence, side effects of NRT formulations, cost of NRT formulations and negligence towards treatment. To overcome this problem and to create awareness, proper medical information about NRT by health professionals should be given to patient and society at regular intervals.<sup>9,10</sup>

**CONCLUSION**

In today's era smoking is major harmful weapon to human health; therefore various efforts are needed in society to stop smoking and to treat smokers. Behavioral support to smokers is much needed along with medicinal support to cure. Nicotine Replacement Therapy (NRT) has been available, to cure nicotine dependency of smokers and emerge as a safe and effective tool for stopping smoking.

**REFERENCES**

1. Wadgave U, Nagesh L. Nicotine Replacement Therapy: An Overview. International Journal of Health Sciences, Qassim University 2016; 10(3): 425-435.
2. Robson N. Nicotine-replacement therapy: a proven treatment for smoking cessation. SA Fam Pract 2010;52(4):298-303.
3. Nolan MB, Warner DO. Safety and Efficacy of Nicotine Replacement Therapy in the Perioperative Period: A Narrative Review. Mayo Clin Proc. 2015;90(11):1553-1561.
4. Flowers L. Nicotine Replacement Therapy. The American Journal of Psychiatry Residents Journal 2017;4-7.
5. <https://www.cancerouncil.com.au/wp-content/uploads/2016/04/CAN-3373-Nicotine-Replacement-Therapy-FAQs-1-5e.pdf>.
6. Stead LF et al. Nicotine replacement therapy for smoking cessation (Review). <http://cochranelibrary-wiley.com/doi/10.1002/14651858.CD000146.pub4/epdf>
7. <https://www.health.govt.nz/system/files/documents/publications/guide-to-prescribing-nicotine-replacement-therapy-nrtv2.pdf>
8. [http://www.who.int/tobacco/health\\_impact/en/ch3.pdf](http://www.who.int/tobacco/health_impact/en/ch3.pdf)
9. Green G. Nicotine Replacement Therapy for Smoking Cessation. American Family Physician 2015;92(1):24 A-B.
10. <http://www.buckshealthcare.nhs.uk/Downloads/Patient-leaflets-smoking-cessation/Nicotine%20Replacement%20Therapy.pdf>