



Combining the nicotine patch with other nicotine replacement products can significantly increase success rates for those who want to quit smoking.

Image Source: Pexels user Redd Angelo

No one ever says they're happy they started smoking. In fact, 70% of smokers report that they want to stop and each year nearly half of all smokers make at least one attempt to quit tobacco.¹ Unfortunately, only about 4-7% of people are able to quit on their own, a testament to the addictive power of cigarettes.² However, when nicotine replacement therapy is used to help smokers quit, that success rate jumps to approximately 30%.

Nicotine replacement therapy (NRT) work by providing nicotine in controlled amounts, minimizing the withdrawal symptoms associated with physical dependence while the user makes behavioral changes to fortify recovery. While historically, users have typically been instructed to pick one type of nicotine replacement product and use it for a short duration—often only up to 12 weeks—new research is providing strong evidence that extended use of NRT and combining nicotine replacement products can significantly increase success rates.

A 2010 study, for example, found that smokers who wore a 21mg nicotine patch for 24 weeks as opposed to 8 weeks were 63% more likely to remain smoke-free at the end of the 24 weeks.³ “There’s nothing magical about 24 weeks,” says Jonathan Foulds, director of the Tobacco Dependence Program at the University of Medicine and Dentistry of New Jersey. “The point is that staying on [NRT] helps you stay off cigarettes—and, it seems, the longer the better.” Researchers have also found that combining the nicotine patch with short-acting products such as the nicotine lozenge, gum, or spray augment success rates. According to a study conducted at the University of Wisconsin’s Transdisciplinary Tobacco Use Research Center, combination therapy led to abstinence rates as high as 40% at the six-month follow-up interviews.⁴ This rate was higher than even bupropion used in combination with the lozenge.

Nicotine patches—the most popular type of NRT—form the foundation of combination therapies due to their unique delivery system. Optimizing user success rates, however, requires close quality control monitoring by manufacturers and rapid, repeatable methods for the determination of nicotine levels.

The Unique Qualities of Nicotine Patches

Why does the nicotine patch form such an ideal base for NRT combination therapy? The answers are found in its mode of action. By delivering a steady level of nicotine transdermally over the course of 16 to 24 hours, former smokers are able to avoid acute withdrawal and end the cycle of highs and lows that typically characterize the smoking experience as well as the experience of those using short-acting NRT. As a result, users are less likely to experience fewer and less intense cravings and are more likely to be able to cope with the cravings they do experience. If cravings are overwhelming, users can top up their nicotine level using an additional product such as the lozenge, gum, or spray. However, the patch forms the underlying foundation for the therapeutic course.

One of the most important benefits of the nicotine patch is that it allows users to gradually wean themselves off nicotine altogether with minimal physical and psychological discomfort. Because the patch is applied once every 24 hours, provides slow release of nicotine, and doesn't require constant decision-making throughout the day, users may be more likely to accept lower nicotine levels without having to make behavioral changes.



Spectrophotometric determination of nicotine levels in nicotine patches is paramount to helping smokers kick the habit and recover safely.

Image Source: Unsplash user Andrew Pons

Spectrophotometric Determination of Nicotine Levels

Pharmaceutical manufacturers have a special obligation to their customers to [create safe, effective products that perform as expected](#) to enhance health and well-being. In the case of nicotine patches, manufacturers must take great care to ensure that the patches both contain and predictably deliver the amount of nicotine expected in order to provide therapeutic benefit to users while avoiding overdose.

[UV-Vis spectrophotometry](#) provides a rapid method of determining nicotine levels both in new patches and during use. In 2010, researchers at the University of Copenhagen, for example, used UV-Vis spectrophotometers as a form of UV imaging to create “a platform for performing in vitro

release studies using Nicorette nicotine patches as a model drug delivery system.”⁵ Nicotine levels were quantified using a double-beam spectrophotometer at 254 nm and used to create nicotine release profiles that show the behavior of the nicotine patches over time. By objectively determining how nicotine was released over the course of wear, pharmaceutical companies are able to refine their products to meet the complex needs of former smokers and help them recover from their powerful addictions.

HunterLab Quality

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