

Tobacco addiction case study



Nick is a thirty-year-old Caucasian male who recently enrolled in your patient panel. He comes in today because he desires to “kick the habit” of tobacco use. He had tried to quit before and succeeded twice, only to start up again. He denies any health problems but has a strong family history of COPD and lung cancer. His father died of lung cancer three months ago, and he has been dreaming of him since then. He does not want to end up the same way.

Past medical history

The patient denies medical problems. He had a vasectomy four years ago at his ex-wife's request, no other surgeries. He has noticed a recurrent morning cough and increased production of mucus over the past two months or so.

Medications- none

Allergies- none

Stage of change- contemplation

Diagnosis- tobacco abuse and addiction

Patient education

Through the use of tobacco, nicotine is one of the most heavily used addictive substances and the leading preventable cause of disease, disability, and death in the United States (Brunton, Chabner, & Knollman, 2011). According to the Center for Disease Control and Prevention, cigarette smoking accounts for around one of every five deaths in the United States (Center for Disease Control and Prevention).

When a person is addicted to a substance, they have a compulsive urge to seek out and use the substance, even when they understand the harmful effects it can have (Brunton, Chabner, & Knollman, 2011). Tobacco products are addictive. With each inhalation of a cigarette the smoker pulls nicotine and other harmful substances into the lungs, where it is absorbed into the blood stream (Brunton, Chabner, & Knollman, 2011). Nicotine is shaped like the natural brain chemical acetylcholine. Acetylcholine is a chemical called a neurotransmitter; this carries messages between the brain cells or neurons (Brunton, Chabner, & Knollman, 2011). These brain cells or neurons have specialized proteins called receptors, into which specific neurotransmitters fit. Nicotine locks into acetylcholine receptors. Nicotine attaches to acetylcholine receptors that release a neurotransmitter called dopamine. Dopamine is released normally when a person experiences something pleasurable. Smoking causes neurons (brain cells) to release excess dopamine, which is the cause of feelings of pleasure when smoking (Brunton, Chabner, & Knollman, 2011). This effect wears off quickly, causing the smoker to get the urge to light up another cigarette for another dose of the drug (Brunton, Chabner, & Knollman, 2011).

Nicotine is the primary addictive component in tobacco, but it is not the only important ingredient (Brunton, Chabner, & Knollman, 2011). People who smoke have a reduction in the level of an enzyme called monoamine oxidase (MAO) in the brain and body. Lower levels of MAO in the brain may lead to higher dopamine levels and this leads to the reason people continue to smoke and continue to get the pleasurable effects from smoking (Brunton, Chabner, & Knollman, 2011).

Long-term use of nicotine products leads to addiction. The way nicotine is absorbed and metabolized by the body enhances its addictive potential (Brunton, Chabner, & Knollman, 2011). Each inhalation brings rapid distribution of nicotine to the brain, but it quickly disappears along with the pleasurable feelings. This triggers the smoker to seek that same pleasurable sensation throughout the day (Brunton, Chabner, & Knollman, 2011). Over the course of the day tolerance develops, requiring more frequent doses or higher doses to get the same effect. Nicotine, heroin, and cocaine have similar effects on the brain (Brunton, Chabner, & Knollman, 2011).

Many people who have a nicotine addiction are in denial. They may be social smokers, meaning they only smoke when out with friends, or they believe they can stop when they are ready (Center for Disease Control and Prevention, 2008). Recognizing the signs of addiction is important for the getting over the addiction. Common signs of addiction include requiring increased use of tobacco to get the same satisfaction, experiencing withdrawal when nicotine levels are low, having the desire to quit but not being able to, experiencing cravings and urges to smoke, and continuing to smoke despite being aware of the health risks (Center for Disease Control and Prevention, 2008).

The physical symptoms of nicotine addiction are caused by withdrawal. Withdrawal occurs because the brain can no longer naturally produce adequate levels of dopamine. Nicotine withdrawal symptoms include anxiety, frustration, irritability, depression, difficulty concentrating, increased appetite, and weight gain (Brunton, Chabner, & Knollman, 2011).

Some of the health risks associated with nicotine use include chronic obstructive lung disease (COPD), lung cancer, asthma, gum disease, mouth and esophageal cancer, heart disease, and stroke. The carcinogens in tobacco products cause abnormal cell growth that can develop into cancer (Brunton, Chabner, & Knollman, 2011).

Deciding to quit smoking is the first step toward becoming a non-smoker and better health (Center for Disease Control and Prevention). After quitting, the risk of stroke can be reduced to that of a non-smoker in as little as two years after quitting (Center for Disease Control and Prevention). Heart rate and blood pressure return to the non-smoker levels after only two hours of not smoking. The rate of heart disease related to smoking is decreased to fifty percent and the rate of lung cancer is substantially reduced (Center for Disease Control and Prevention).

Steps to nicotine abuse and addiction recovery that may help are to set a date to quit; this allows the person to get in the mindset to stop (Center for Disease Control and Prevention, 2008). Knowing the triggers that make the person want to smoke is another important factor. Some triggers commonly observed that increase the desire to smoke are after a meal, while driving, drinking alcohol, boredom, stress, coffee, and being around other people that smoke (Center for Disease Control and Prevention, 2008). Having a strong support system is another important factor in quitting. Informing the people around the smoker of the decision to quit may help to support the decision as well as holding the smoker accountable for the goal of quitting. It is easier to stop smoking if the people around support the effort to stop smoking (Center for Disease Control and Prevention, 2008).

If the smoker is thinking about quitting, or has made the decision to quit, there are several products to help in the process of quitting and prevent many of the withdrawal symptoms. Nicotine replacement is an alternative to stopping cold. Many people find it easier to use a replacement therapy such as the nicotine patch, inhaler, or nicotine gum. This may make the transition easier and more comfortable for the person trying to quit (Center for Disease Control and Prevention, 2008).

Tobacco dependence is a chronic disease that often requires repeated interventions and multiple attempts to quit. Effective treatments exist; however, that can significantly increase the rate of long-term abstinence. Counseling and medications are effective when used by themselves. The combination of counseling and medications, however, is more effective than either alone (Center for Disease Control and Prevention, 2008).

Products designed to help quit tobacco abuse and addiction

Bupropion SR treatment should begin one to two weeks before the quit date. The starting dose for tobacco cessation is 150mg orally every morning for three days, then 150mg orally twice daily. This dosage should be continued for seven to twelve weeks. For long-term dosage, use of bupropion SR 150 mg for up to six months post-quit may be used (Center for Disease Control and Prevention, 2008).

Common side effects include insomnia and dry mouth. Insomnia may be addressed by taking the evening pill at least eight hours before bedtime, with at least eight hours between doses (Center for Disease Control and Prevention, 2008).

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Nicotine gum is available in both regular and flavored forms. The gum dosage is available in two milligrams and four milligram doses. Smokers should use at least one piece every one to two hours for the first six weeks (Center for Disease Control and Prevention, 2008). The gum should be used for up to twelve weeks with no more than twenty-four pieces to be used per day. Common side effects of the gum include mouth soreness, hiccups, dyspepsia, and jaw ache. These effects are generally mild and transient, often caused by the patient's chewing technique (Center for Disease Control and Prevention, 2008). This can be alleviated by correct chewing techniques. The gum should be chewed slowly until taste emerges, then parked between the cheek and gum line to facilitate absorption. The gum should be slowly and intermittently chewed and parked for around thirty minutes or until taste dissipates from the gum (Center for Disease Control and Prevention, 2008).

Nicotine Inhalers-A dose from the nicotine inhaler consists of a puff or inhalation. Each cartridge delivers a total of one milligram of nicotine over eighty inhalations (Center for Disease Control and Prevention, 2008). Recommended dosage is six to sixteen cartridges per day. Duration of the therapy is up to six months. Side effects include local irritation in the mouth and throat, coughing, and rhinitis. The severity of the irritation is mild and the frequency of symptoms decline with continuous use (Center for Disease Control and Prevention, 2008).

Nicotine lozenges are available in two milligrams and four milligram doses (Center for Disease Control and Prevention, 2008). Generally, smokers should use at least nine per day in the first six months of therapy, and should be used for up to twelve weeks, with no more than twenty lozenges used per

day (Center for Disease Control and Prevention, 2008). The two milligram is recommended for smokers that have the first cigarette more than thirty minutes after waking. The four milligram is used for patients that have the first cigarette within thirty minutes of waking (Center for Disease Control and Prevention, 2008). The most common side effects include nausea, dry mouth, hiccups, and heart burn. Use of the four milligram lozenges may also cause increased rates of headaches and coughing. The lozenge should be allowed to dissolve in the mouth rather than chewing or swallowing it (Center for Disease Control and Prevention, 2008).

Nasal spray-The nicotine nasal spray produces higher peak nicotine levels than other nicotine replacement therapies (NRT) and has the highest dependency potential (Center for Disease Control and Prevention, 2008). A dose of the nasal spray consists of one 0.5 mg dose delivered to each nostril (1mg total). Initial dosing should be one spray per hour, increasing as needed for symptom relief (Center for Disease Control and Prevention, 2008). Minimum dosage is eight doses daily with a maximum of forty doses per day. Each bottle contains around one hundred doses. Recommended duration of therapy is three to six months (Center for Disease Control and Prevention, 2008). Patients should not sniff, swallow or inhale through the nose while administering doses, as this increases irritation. The spray is best delivered with the head slightly tilted back. Users report moderate to severe nasal irritation in the first two days of use. Nasal congestion and transient changes to taste and smell are also reported (Center for Disease Control and Prevention, 2008).

Nicotine patches- treatment of eight weeks or less have been shown to be as effective as longer treatment periods (Center for Disease Control and Prevention, 2008). Patches of different doses are available. Dosing regimens should be based on patient characteristics such as amount smoked and degree of dependence (Center for Disease Control and Prevention, 2008). The step down dosage includes four weeks of twenty-one milligram per day patches, then two weeks of the fourteen milligram per day patches, then two weeks of the seven milligram per day patches (Center for Disease Control and Prevention, 2008). There is a single dose regimen available in twenty-two and eleven milligram per day patches for other step down regimens. Up to fifty percent of patients using the patch will experience a local skin reaction. These skin reactions are usually mild and self-limiting, but may be worsened during the course of therapy (Center for Disease Control and Prevention, 2008). Local treatment with a one percent hydrocortisone cream or a five percent triamcinolone cream, and rotation of patch sites may ease the skin irritation. Other side effects of the patches include insomnia and vivid or strange dreams. At the start of each day the patient should place a patch in a relatively hairless area, typically between the neck and waist, rotating the site daily to reduce irritation (Center for Disease Control and Prevention, 2008). The patch should be applied as soon as the patient wakes on the quit day. If insomnia is a problem, the patient should remove the patch prior to going to bed (Center for Disease Control and Prevention, 2008).

Varenicline is an approved non-nicotine agent for smoking cessation (Center for Disease Control and Prevention, 2008). The FDA added a warning

regarding the use of this agent. Depressed mood, agitation, changes in behavior, suicidal ideation, and suicide have been reported in patients attempting to quit smoking when using Varenicline (Center for Disease Control and Prevention, 2008). Any history of psychiatric illness should be discussed before using this medication. Side effects of the medication include nausea, trouble sleeping, and abnormal or vivid dreams (Center for Disease Control and Prevention, 2008).

The patient should start Varenicline one week before the quit date, with a dose of 0.5 milligram daily for three days followed by 0.5 milligram twice daily for four days, followed by one milligram twice daily for three months. Varenicline is approved for maintenance therapy for up to six months (Center for Disease Control and Prevention, 2008). The patient should quit smoking on day eight, when the dosage is increased to one milligram twice daily. To reduce the insomnia problem, the second dose should be taken at dinner time rather than bedtime. To reduce the nausea, the medication should be taken on a full stomach (Center for Disease Control and Prevention, 2008).

Varenicline is a non-nicotine medication. The mechanism of action is due to its partial nicotine receptor agonist and antagonistic effects (Center for Disease Control and Prevention, 2008). Because Varenicline is eliminated almost entirely unchanged in the urine it should be used with caution in patients with severe renal dysfunction. It is not recommended to be used with other nicotine replacement therapies because of its nicotine antagonistic properties (Center for Disease Control and Prevention, 2008).

Plan of treatment

Patient will be advised that the increased cough and mucus production is related to the use of tobacco products and that once he no longer smokes the frequency of cough and mucus production will decrease as this is related to irritation in the lungs caused by tobacco use. A smoker's cough is a persistent cough that develops in long-term smokers. At first it may be dry, but over time it usually produces phlegm. The cough is usually worst upon awakening and improves throughout the day. The airways are lined with tiny hair like cells called cilia, which catch toxins in inhaled air and move them upward toward the mouth to be expelled. Smoking paralyzes these cells. Instead of toxins being caught in transit, toxins enter the lungs and create inflammation. This leads to coughing as the lungs attempt to clear these toxins. As the Cilia begins to repair themselves during the night and attempt to remove the accumulated substances from the lungs, the result is coughing upon arising. This cough will usually fade as the Cilia is allowed to repair themselves from the abstinence of cigarette smoking.

Treatment will consist of smoking cessation counseling and support, Varenicline 0.5 mg daily, starting immediately, orally once daily for three days, then 0.5 mg orally twice daily for four days, followed by one mg orally twice daily for three months. Follow up should be in three days to evaluate side effects and patient response. The next follow-up will be dependent on patient progress and response to medication. The patient will be instructed on the community resources for smoking cessation support groups and how to cope with the stress of not smoking and how to manage daily frustrations related to smoking cessation. Dietary counsel will be offered for possible

nutrition advice and weight management. The patient will be encouraged to enroll in an exercise program or to increase physical activities during the initial phase of smoking cessation. A chest x-ray will be ordered, at the patient's convenience, to rule out COPD or other lung issues.

References

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