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TOBACCO CESSATION STRATEGIES FOR 21ST CENTURY

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Abstract

The nicotine supply received from tobacco was considered to be a major contributing factor in creating and maintaining a smoking habit. The hypothesis that nicotine has pharmacological effects that a smoker might desire is supported by reports in the literature of both animal experiments and human observations. Hence, it was thought that smoking withdrawal would be easier if the ex-smoker can supply himself with suitable doses of nicotine while avoiding the dangers of tar and carbon monoxide in the smoke.

To help smokers quit smoking, a chewing gum containing nicotine bound to an ion exchanger was developed. The advantage of this preparation are that it allows administration in a

convenient way of nicotine ad libitum, it precludes intoxication of the preparation if swallowed and it allows reducing the nicotine content for withdrawal purposes while keeping other properties unchanged. The preparation is now undergoing clinical trials.

Key words: Smoking, NRT, Withdrawal, Nicotine, Tobacco.

INTRODUCTION

Tobacco is a plant originally indigenous to America which is now grown across the world. Cigarette smoke contains over 7,000 chemicals, with 70 chemicals reported to cause cancer. Tobacco products are made up of 28 carcinogens, known to increase the risk of developing oral cancers.[1] The chemical composition of smoke at different stages of cigarette consumption depends on the frequency, intensity, volume, and duration of puffs.[2] Tobacco raises the risk of cancer, heart attack, stroke, peripheral vascular disease, osteoporosis, chronic obstructive pulmonary disease, diabetes, and reproductive adverse outcomes.[3]

According to the Manual for Tobacco Cessation 30-40% of 2.3 billion children and teenagers in the world would become tobacco users in early adult life.[4] By the year 2030 tobacco will annually kill more than 10 million people based on current trends used.[3] There are 91.58 deaths from smoking per 1, 00,000 population in India in 2017. Recent estimates indicate that 10% of tobacco consumers globally reside in India.[5,6]

GATS Fact Sheet for Uttar Pradesh (2016-17) showed that 23.1% of men, 3.2% of women, and 13.5% of all adults who actively smoke tobacco. The prevalence of tobacco use among people aged 15-17 has dropped from 8.0 percent in GATS-1 to 18.7 in GATS-2. The mean age at the beginning of tobacco use increased from 18.0 years in GATS-1 to 18.7 years in

GATS-2. The health care provider advised quitting smoking in 36.5% and smokeless tobacco in 25.5% of users.[7]

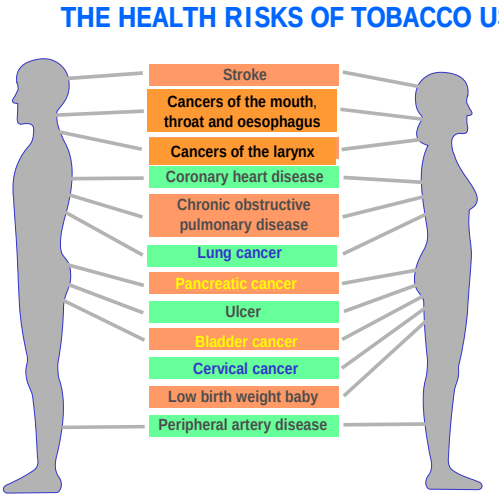
When a person tries to stop, nicotine can cause painful withdrawal symptoms.[8] Nicotine replacement therapy (NRT) products were developed to help smokers quit, and are free of abundant toxicants and carcinogens in tobacco and cigarette smoke.[9] NRT give you nicotine in the form of gum, patches, sprays, inhalers, or lozenges - but not the other harmful chemicals in tobacco. The need for taking this topic because there are many methods for quitting the habit, there are recent strategies was discussed in a single place.

HEALTH CONSEQUENCES

Tobacco has a very harmful effect on general and oral health:

General Health: Tobacco use has been considered a potential risk factor with significant deleterious effects for chronic conditions such as cancer, cardiovascular and respiratory diseases. Research by Doll et al found that cigarette smoking is strongly associated with lung cancer, chronic obstructive lung disease, and cardiovascular diseases.[10] Smoking is a major tuberculosis risk factor in India, some research findings suggest.[11]

During pregnancy, smoking raises baby's risk of low birth weight, miscarriage, premature birth, Sudden Infant Death Syndrome (SIDS) and etc.[12,13] Tobacco use can also induce oxidative damage, increased inflammation, increased levels of inflammatory markers, cataracts, and macular degeneration associated with ageing.[14] During pregnancy, smoking has six times greater chances of developing cleft palates.[10] Maternal tobacco use recently was linked to the production of primary caries in their children[15] Tobacco suppresses the immune system’s response to oral infections.[10]



Not a single part of the body is spared from the harmful effects of tobacco

Oral Health: People who are addicted to smokeless tobacco often use it for many years, which may lead to significant issues with oral health, which included:[16,17]

Tooth stains

• Smoker's melanosis

• Acute Necrotizing Ulcerative Gingivitis (ANUG), oral keratosis

• Nicotinic stomatitis, keratotic patches, black hairy tongue, palatal erosions

• Gingival recession and loss of bone in the jaw

• Tooth abrasion

• Chronic bad breath

• Yellowing of teeth, gum and tooth disease, leading to cavities, lost teeth, and painful sores

• Leukoplakia (white, leathery, pre-cancerous patches that may develop where tobacco is held in the mouth, such as the cheeks, gums, or tongue, and may become cancerous)

• Oral carcinoma (including the lip, tongue, cheek, and floor and roof of the mouth) and throat.

ROLE OF DENTAL PROFESSIONALS

The World Dental Federation (FDI) established the World Dentistry Section against Tobacco in 1996 and adopted the FDI position statement on Tobacco[18] at the early stage of use, dental practitioners can identify adverse effects of tobacco use in the oral cavity.[19]

To adopt a tobacco-free lifestyle, dentists can influence the children and youth. Treat women of childbearing age and can educate them about the hazards of using tobacco during pregnancy. Research by Brothwell DJ revealed that oral health practitioners are effective in increasing the number of patients who quit smoking successfully.[20] The Oral Health Network and Tobacco Use Prevention and Cessation (OHNTPC), founded with the first European Workshop in 2005, facilitate the ongoing support and future collaborations among all oral health professionals.[21]

Dental Professionals

- Dentists are particularly concerned about the adverse effects that tobacco practices cause in the oropharyngeal area of the body.
- Dentists have access to children, youth, and their families and they can therefore influence individuals to delay, postpone, or stop using cigarettes before becoming heavily dependent on them.
- Dentists have more time with their patients than other physicians and can therefore integrate education and intervention methods.
- Dentists also treat women of childbearing age and can warn them about the potential harm that tobacco use could bring to their children.

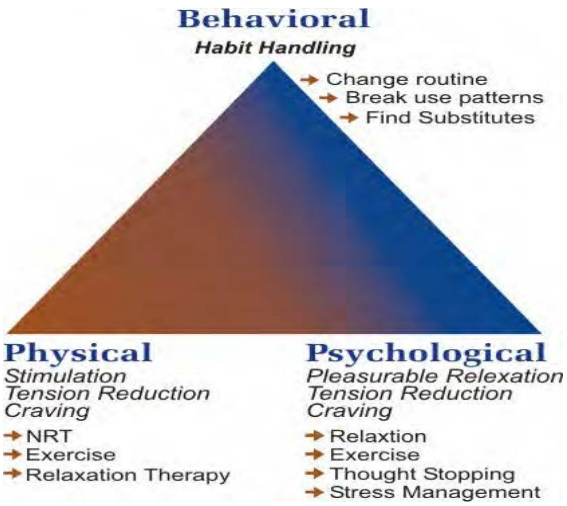
- Dentists will create and maintain the patient's interest in stopping the use of tobacco by showing him examples of how tobacco can damage the teeth.
- Follow-up is easier with dental patients as treatment is spread over multiple appointments.
- Tobacco intervention is an excellent practice builder. It expands the dentist's professional skills and strengthens the doctor-patient bond, leading to increased patient referrals.[22]

TOBACCO CESSATION

Tobacco Cessation Clinic is an initiative of both the World Health Organization and India's Ministry of Health. Formal cessation activities began with the opening in 2002 of 13 tobacco cessation clinics in Anand, Bhopal, Bangalore, Chandigarh, Chennai, Cuttack, Delhi, Goa, Jaipur, Lucknow, Mumbai, and Patna.[23] In 2005, tobacco cessation clinics were changed as cessation centers. Five more cessation centers for tobacco have been developed in Mizoram, Guwahati, Kolkata, Hyderabad, and Trivandrum, making a total of 18 centers. The cessation of tobacco is important in reducing mortality and morbidity related to tobacco. This is an insufficient effort taking into account the existing 250 million tobacco consuming populations.[24]

Methods of cessation of cigarettes are commonly categorized into: [25]

a) Cognitive Behavioural Therapy (CBT) includes methods such as self-help and brief interventions that can be provided by health professionals.
b) Pharmacological methods like Nicotine Replacement Therapy (NRT) and bupropion-like antidepressants.



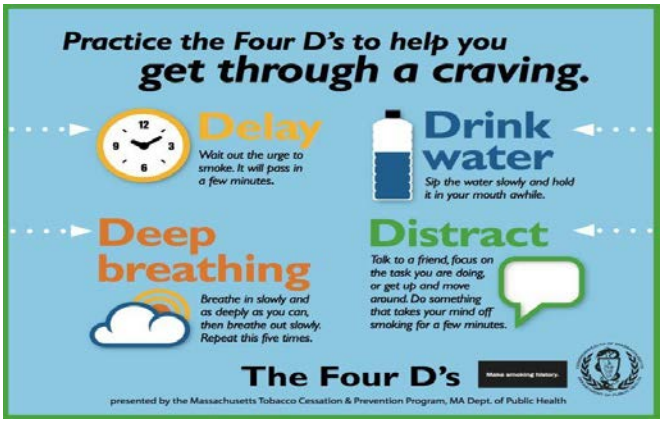
The Addiction Triangle to assess Treatment Needs

A. BEHAVIOUR INTERVENTIONS (Non-Pharmacological Cessation Strategies):

A variety of coping strategies for dealing with triggers and high-risk situations could be suggested. Ideally, the client should suggest his/her alternatives and substitute activities.[26]

The 4D's are about behavioral coping strategies:

- **Delay:** Acting on the urge to smoke. Five minutes later the desire to smoke weakens and the determination to quit.
- **Deep breathing:** Take in a long slow breath, and release it again slowly. Repeat three times.
- **Drink water:** Slowly hold it up in your mouth to savor the taste a little longer.
- **Distract:** To take smoking off your mind. A good alternative is doing some exercise.

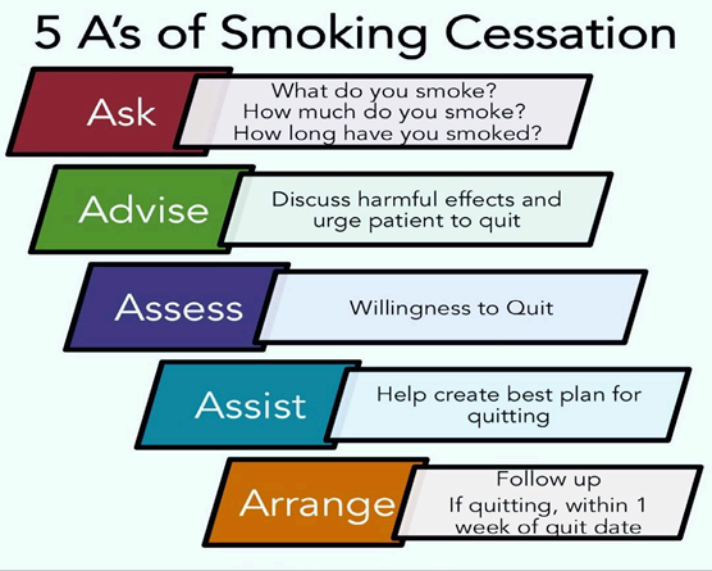


Common Cessation Aids are:

- **Cold Turkey** - Abruptly stopping all tobacco use. Cold turkey is the simplest and easiest way to quit for some people.
- **Tapering -** Cut down the number of smoked cigarettes/bidis (or smokeless tobacco consumed) every day until the consumer realizes they no longer are using it. This method involves setting a quit date by which the client will have tapered down to the point that they are no longer using tobacco.

Strategies for Tobacco Cessation - Clinical Practice Guidelines: The 5 "A's" and 5 "R's":

- **The Five A's:** Ask, Advice, Assess, Assist, and Arrange, and **five R's**: Relevance, Risk Rewards, Repetition, Roadblocks is a five-to-fifteen-minute strategy that has proven successful globally. Such telephone-based programs have shown a higher degree of abstinence from the smoking of about 30-50 percent than usually achieved. Fiore et al (2000) suggested that while the 5'A's are useful for individuals who are ready to quit, the 5'R's should be used for those who are not ready to quit.[18,27]



The 5 major steps in this intervention are: **ASK - ADVISE - ASSESS - ASSIST - ARRANGE**[28]

STRATEGY 1 (about tobacco use) **Ask**- Systematically identify all tobacco users at every visit. Implement an office-wide system t allows for inquiry and documentation of tobacco use for every patient at every visit
STRATEGY 2 (to quit) **Advice**- Urge all smokers to quit clearly, forcefully, and personally.
STRATEGY 3 (commitment and barriers to change) **Assess**- Access the tobacco dependence in every smoker if he or she is willing to make a quit attempt at this time
STRATEGY 4 (users committed to change) **Assist**- Aid the patient in quitting. Help patients with the development of a quit plan. Encourage nicotine replacement therapy and/or bupropion if there are no contraindications. Give key advice on successful quitting techniques. Provide supplementary materials
STRATEGY 5 (follow-up to monitor progress) **Arrange**- Schedule follow up contact in person or via telephone

RELEVANCE - RISK - REWARD - ROADBLOCK - REPEATITION

STRATEGY 1 **Relevance**- Personal relevance is highly motivating. Everything related to the patient's oral condition, age, gender, other health issues, and familial circumstances. Ask the patient to show that it is personally relevant to quit. Enlighten the patient about what he/she does not know.

STRATEGY 2 (of continuing tobacco use)
Risks

a) **Acute risks:** Oral wounds are not healing well, periodontal disease is increasing and blood cholesterol is rising, pregnancy, impotence and infertility (in males), and increased levels of carbon monoxide in the blood (in smokers) may be harmful.
b) **Long-term risks:** Tooth loss, OSMF in consumers of products containing areca nut (supari), oral and other cancers; heart attack and stroke; lung disease (in smokers); disability; financial loss due to prolonged healthcare needs.
c) **Environmental risks:** Among smokers, the spouse's risk of developing lung cancer and heart disease is increased. Women may give birth to children with low birth weight; and children exposed to tobacco smoke, among others, are at risk for developing sudden infant death, respiratory infections, asthma, and middle ear disease. Chewers scatter germs and spit a mess.

STRATEGY 3 (to be emphasized)
Rewards of quitting

- Improved oral health: Healthier gums and teeth, better-smelling breath
- Feel better/perform better
- Increased energy levels
- Food tastes better
- Money is saved
- Sets a good example to children
- Worry about quitting stops
- A longer and healthier life

STRATEGY 4 (to quitting)
Roadblocks

- Fear of withdrawal symptoms
- Fear of failure
- Lack of support
- Enjoyment of tobacco
- Fear of weight gain
- Depression

STRATEGY 5 (these messages at each visit)
Repeat

- Each time an unmotivated patient visits, repeat the motivational messages.
- Nicotine consumers who have tried to quit and failed need to learn that most people make repeated attempts before they succeed.

STAGES OF READINESS TO CHANGE

Prochaska and Di Clemente (1983) have described a series of stages in which people go through making changes in behavior. A person thinks and feels differently about the problem behavior at each stage, and discovers that different processes and strategies are helping them move on to the next level. The model can be imaged as a circle in a diagram.

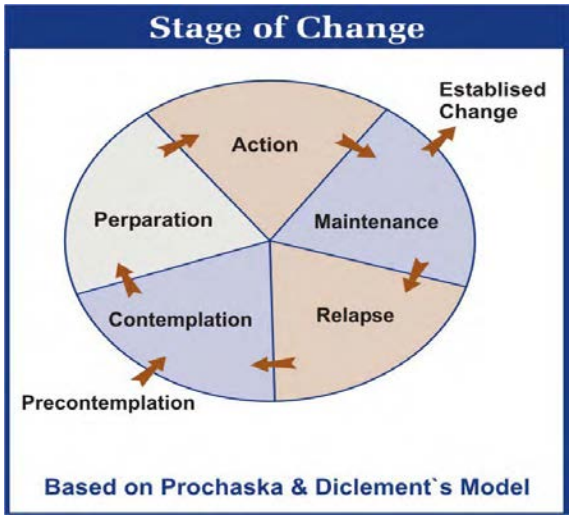
a) **Pre-contemplation (Not ready) -** Such tobacco consumers don't take stopping seriously over the next 6 months. They just see the positive aspects of tobacco and don't want to recognize the disadvantages. Encourage such a person to think about his/her tobacco use and make an offer of help. Offer them written information on the harms of using and benefits of quitting.

b) **Contemplation (Unsure) -** Such tobacco users are considering quitting seriously in the next 6 months. This community is particularly suitable for brief motivational interviews. Explore relevant health effects of tobacco use and barriers to cessation. Provide them the written information and inform them about support services.

c) **Preparation (Ready) -** Most cigarette consumers plan to quit in the next 30 days and have usually made a 24-hour quit attempt over the last year. This group is motivated to quit soon and is the group most likely to attempt to quit shortly. This is the best opportunity, which may be available for a short time, and is the group most likely to ask for help with quitting.

d) **Action -** They are registered consumers of cigarettes who have quit within the last 6 months. This is when the risk of relapse is highest in the first week, with about 75 percent of relapses occurring at this stage. It is a time where support and relapse prevention strategies are important. If relapse occurs, this must be should not be seen as a failure, but considered as a learning experience and as part of the quitting process.

e) **Maintenance -** There are tobacco users who have quit for more than 6 months. The behavior of non-tobacco use is established, and the threat of tobacco use is gradually decreasing. Over time the chances of relapse decrease. Only about 4 percent of those who have quit using tobacco for more than two years have ever resumed.



Prochaska Model 1983

B. PHARMACOTHERAPY[29]

Two lines of drugs in pharmacological interventions available to prevent smoking have been demonstrated with behavior support.

First Line of Drugs

- Nicotine Replacement Therapy
- Bupropion
- Varenicline

Second Line of Drugs

- Nortryptiline
- Clonidine

NICOTINE REPLACEMENT THERAPY

There are 5 types of nicotine replacement therapy (NRT) have been approved by the US Food and Drug Administration (FDA):

- Patch
- Gum
- Patches
- Nasal spray
- Inhalers
- Lozenges

Mechanism of Action of NRT:

NRT's main mode of action is thought to be the stimulation of nicotinic receptors in the brain's ventral tegmental area, and the consequent release of dopamine in the accumbens nucleus. This and other peripheral nicotine actions lead to a reduction in the effects of nicotine withdrawal in regular smokers who abstain from smoking.[30] Nevertheless, it does not eliminate the withdrawal symptoms, likely because none of the nicotine delivery systems available reproduce the rapid and high levels of arterial nicotine achieved when cigarette smoke is inhaled. All medicinal nicotine products available rely on systemic venous absorption and therefore do not achieve such rapid systemic arterial delivery. A high dose of a cigarette's nicotine takes a few seconds to enter the brain; medicinal drugs achieve lower levels over minutes (for nasal spray or oral products such as gum, inhaler, sublingual tablet, or lozenge) and hours (for transdermal patches).

CHOOSING AND USING THE RIGHT NICOTINE REPLACEMENT THERAPY FOR YOU

Here are some important points to think about as you decide:

a) Nicotine gums, lozenges, and inhalers are alternatives that you can place in your mouth so you can monitor your intake and help keep your cravings more under the monitor.
b) Nicotine gums and lozenges are usually sugar-free but consult with the manufacturer if you are diabetic and have any doubts.
c) Nicotine nasal spray works quickly when it's needed.
d) Nicotine inhalers allow you to mimic cigarette use by puffing the inhaler and holding it. It works quickly too.
e) Patches of nicotine are convenient and should only be placed on once a day.
f) Inhalers and nasal sprays both require a prescription from a doctor.
g) Due to allergies or other disorders, some people may not be able to use patches, inhalers, or nasal sprays.
h) The nicotine gum can stick to dentures or dental work which makes it difficult to chew before "parking."
i) Take your NRT at the recommended dose, whatever form you use, and only use it for as long as recommended.
j) Nicotine replacement therapy (NRT) is meant for use for a limited period. Before NRT is stopped, use should be tapered down. Studies have not shown that extending the use of NRT longer than the prescribed period significantly impacts performance.

a) NICOTINE GUM

It is available since 1984[18] the use of nicotine gum increases the rate of cessation by 50 to 70 percent.[31] Chew in one day, no more than 24 pieces of gum. Nicotine gum is generally recommended for 6 to 12 weeks, but no more than 6 months.

Patient Instructions for Nicotine Gum

1. Do not smoke while you are using gum.
2. Use one piece of gum at a time and use 1 piece/hour on a fixed schedule.
3. Chew the gum gradually until the gums get a peppery taste or tingling. Then, stop chewing and place the gum between the gums and cheek until it stops tingling. Start chewing gum again, and repeat about 30 minutes of parking and chewing process.
4. The gum needs to be stored to absorb the nicotine through the buccal mucosa. If individuals don't park the gum, more nicotine would be swallowed resulting in side effects including nausea and vomiting.
5. Never eat or drink or anything 15 minutes before and during gum use. Nicotine absorption via the buccal mucosa is reduced by an acidic environment; thus, patients should not use drinks (e.g., coffee, soda, juice) immediately before, during, or after use of nicotine gum.

Precautions: Pregnancy, Lactation, CVD, Peripheral Vascular Disease, Endocrine disorders, Oral or pharyngeal inflammation or esophagitis, Gastric ulcers.

Possible side effects of nicotine gum include: Significant side effects of the nicotine-gum are very rare. Bad taste, irritation of the throat, sores of the mouth, hiccups, nausea and discomfort of the jaw, heartbeat racing, nausea, and gum can also stick to and damage the dentures and dental work.

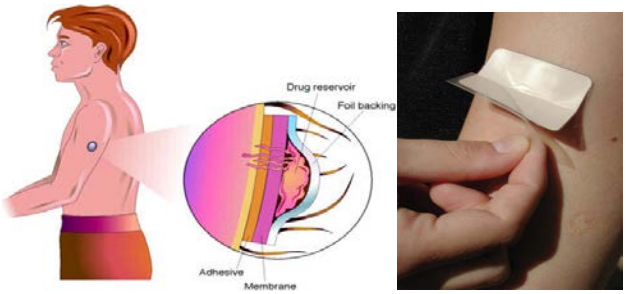
b) NICOTINE PATCH[32,33,34,35,36]

Nicotine Transdermal patches are available since 1991. It is planned to gradually and steadily release the nicotine. Patches can be purchased with or without a prescription. Patches give nicotine a measured dose through the skin. By switching to lower-dose patches over weeks you are weaned off nicotine.

The 16-hour patch works well if you are a light-to-average smoker. It has less chance of triggering side effects. But during the night it does not deliver nicotine, so if you have symptoms of early morning withdrawal it may not be correct.

The 24-hour patch provides a steady dose of nicotine, avoiding highs and lows. It helps with the withdrawal early in the morning. However, there could be more side effects.

The majority of smokers will start using a full-strength patch (15-22 mg nicotine) daily for 4 weeks, depending on body size and smoking habits, then use a weaker patch (5-14 mg nicotine) for 4 weeks.



Possible nicotine patch side effects include skin irritation (redness and itching), dizziness, heartbeat racing, sleep problems or unusual dreams, headache, nausea, muscle aches, and stiffness.

What to do about side effects

- Try another patch brand, if your skin gets irritated.
- Reduce the nicotine content by using a lower-dose patch.
- Problems with sleep can go away within 3 or 4 days. If not, try switching to a 16-hour patch and you are using a 24-hour patch.
- Avoid using the patch, and try another NRT type.

c) NASAL SPRAYS[37,38,39]

Nicotine nasal spray is available by prescription only. The nasal spray quickly delivers nicotine to the bloodstream, as it is absorbed through the nose. It is the quickest delivery of all nicotine replacement drugs and the highest nicotine levels. And the long term cessation roughly doubles.[40]

How to use nicotine nasal spray

The easy spray contains 0.5 mg of nicotine, and each nostril contains a single dose (1 mg) of spray. Absorption occurs through the nasal mucosa, and peak concentrations of plasma nicotine are reached within 10-15 minutes. Give 1-2 doses per hour, and then titrate the dose to a maximum of 40 mg per day per person requirement. The FDA suggests prescribing the spray for 3-month periods and not uses it for longer than 6 months.

Possible side effects of nicotine spray: The spray's most common side effects get better in about 1 to 2 weeks and can include: nasal irritation, runny nose, watery eyes, sneezing, inflammation of the throat, and coughing. Many side effects are smoking-related: heart racing, nervousness, and headache. Nobody has all the side effects and certain individuals have none. Any side effects, such as heart pounding, may occur because you have had too much nicotine.

d) NICOTINE INHALER[41,42,43]

Nicotine inhaler released in 1998 is more of a "puffer" composed of a plastic tube containing a nicotine cartridge than an inhaler. Inhalers are available by prescription only.

How to use the nicotine oral inhaler: You puff on the inhaler and the cartridge sends into your mouth a pure nicotine vapor. You could use the cartridge all at once for about 20 minutes, or only puff it up at a time for a few minutes. The recommended dosage ranges from 4 to 20 cartridges a day, tapering gradually over 6 months.

Possible side effects of the nicotine inhaler: The most common side effects including coughing, mouth and/or throat irritation, runny nose, and upset stomach, particularly when first use the inhaler.

e) NICOTINE SUBLINGUAL TABLETS AND LOZENGES[33,34,44,45]

Nicotine is given in a micro tablet compared to nicotine gum; thus, a daily dose of 80 mg/day should be taken more regularly. On the other side, lozenges more than the nicotine gums, it offers 25-27% of nicotine. This will require at least 7-8 lozenges a day with no more than 25 lozenges a day.

Nicotine lozenges can be bought without a prescription. The lozenge is available in 2 strengths: 2mg and 4mg. Smokers choose their dose based on how long they usually take their first cigarette after they wake up, 4 mg of nicotine lozenges were used if you smoke your first cigarette within 30 minutes of waking, and 2 mg of nicotine lozenges, if you smoke your first cigarette more than 30 minutes after waking up.

How to use nicotine lozenges: The prescribed dosage is 1 lozenge for 6 weeks every 1 to 2 hours, then 1 lozenge every 2 to 4 hours for 7 to 9 weeks, and finally, 1 lozenge every 4 to 8 hours for 10 to 12 weeks.

The lozenge makers also recommend:

- Do not eat or drink a lozenge at least 15 minutes before using it or while using a lozenge. (Some drinks will make the lozenge function better)

- Do not eat or drink at least 15 minutes before you use a lozenge or while you use a lozenge.
- Suck on the lozenge for about 20 to 30 minutes before it is fully dissolved. Shift it up in your mouth from side to side. Don't chew or bite like a hard treat, and don't cough. The nicotine is absorbed through oral mucous membranes.
- Using no more than 5 lozenges in 6 hours or 20 lozenges a day.
- Quit 12 weeks after using the lozenge. Consult your doctor if you ever feel like using the lozenge.

Possible side effects of the nicotine lozenge include nausea, hiccups, sore throat, coughing, heartburn, headache, acidity, trouble sleeping, and a racing heart.

f) NICOTINE VACCINE[46,47,48]

A new approach to assist with the cessation of smoking is the production of a vaccine specific to nicotine. The binding of nicotine to a sufficient antigenic protein stimulates the production of antibodies (Nic-IgG), which have a high affinity and nicotine specificity. Those blood antibodies sequester nicotine that inhibits it from reaching the brain. It can be administered 2-4 times, with results that last several months. Nicotine vaccines are at an advanced stage of clinical evaluation and are still not approved for individual care. Those are the NicVAX vaccine, vaccine NIC 002, vaccine TA-NIC, vaccine Niccine, and vaccine SEL-068.

NICVAX VACCINE

3’-aminomethyl nicotine conjugated to Pseudomonas aeruginosa r-exoproteinA (3’-AmNic-rEPA) vaccine designed by Nabi Pharmaceuticals/GlaxoSmithKline, was initially developed as an aid in smoking cessation. Several doses are given before the scheduled quit date, resulting in a

steady rise in anti-nicotine antibodies that help smokers slowly decrease the number of cigarettes and finally achieve full abstaining. Nicotine vaccinations can also be used to prevent relapse.

Therefore, vaccinated ex-smokers who relapse (i.e. take a cigarette puff, have a positive smoking status for 1 week after an abstinence period) are likely to experience a decreased benefit from nicotine inhalation that may avoid a full-blown relapse (i.e., a positive smoking status for at least 2 weeks after an abstinence period).[49]

g) E-CIGARETTES

Electronic cigarettes (grouped into e-cigarettes) are nicotine delivery devices operated by batteries. These come in many variations but can typically be classified into three categories: cigalikes, which are models in shape and size similar to conventional cigarettes; eGos, which are larger than cigalikes, usually with a removable 'tank' that can be replenished with e-liquid containing nicotine; and mods, which are usually larger than eGos and almost endlessly customizable. E-cigarette use among adults and youths is growing. Most e-cigarettes are unregulated. Few countries have placed bans on the selling of some types of e-cigarettes, but compliance has been difficult due to the availability of e-cigarettes of all varieties on the Internet.

The US Food and Drug Administration (FDA) have suggested that e-cigarettes should be considered a tobacco product. The new regulations would ban the selling of e-cigarettes to minors.[50]

FIRST LINE OF DRUGS

Bupropion

Bupropion therapy influences smoking cessation before and after pregnancy; however, further research is required into the possible benefit/risk ratio of bupropion therapy to cessate smoking during pregnancy. Bupropion has benefits in terms of effectiveness compared to NRT which are relevant to pregnant women. A well-conducted, randomized study found that treatment with bupropion in non-pregnant individuals resulted in higher abstinence levels than placebo and nicotine patch alone. The introduction of nicotine did not increase the abstinence levels substantially relative to bupropion care alone. Bupropion and its active metabolites, however, cross the placenta to the foetal circulation, and hence there is high exposure to the foetus. The hydroxybupropion and threohydrobupropion concentrations in the venous plasma of the umbilical cord are higher than those of bupropion. Besides, threohydrobupropion levels in the amniotic fluid are higher than those in the venous plasma of the umbilical cord, indicating that those enzymes are most likely present in the foetus. Placental transfer and recirculation of amniotic fluid have yet to determine the biological effects of foetal exposure to maternally administered bupropion and/or its active metabolites. A review[26] through 2008 of all available data (prospective and retrospective) suggested a low probability of teratogenicity. A review of two subsequent studies found that in infants exposed to bupropion in the first trimester (alone or in combination with other antidepressants) the prevalence of left ventricular outflow tract obstruction increased relative to infants exposed to other antidepressants, but the limited number of cases precluded drawing a clear conclusion about this association. In light of these results, we suggest waiting until the second trimester before starting bupropion therapy.[51]

Bupropion (Zyban) with its dopaminergic activity significantly reduces the symptoms of withdrawal and nicotine cravings can thus be used to stop smoking. It can be used in abstinent

smokers to avoid relapse and weight gain attenuation. A meta-analysis of several trials showed that bupropion almost doubles cessation levels, an efficacy similar to NRT.[51]

Possible side effects of the Zyban include 1 in 1000 chance of a seizure. Other side effects include dry mouth, sleeping problems, and a skin rash.

VARENICLINE

Tobacco smoking during pregnancy is associated with a higher risk of several adverse outcomes including spontaneous abortion, mortality, premature delivery, restriction of intrauterine growth, placental abruption, congenital malformation, sudden infant death syndrome, childhood cancer, behavioral and neurodevelopmental disorders, asthma, obesity, and diabetes. Healthcare professionals encourage cessation of smoking among patients who failed to quit smoking before pregnancy.

SECOND LINE OF DRUGS

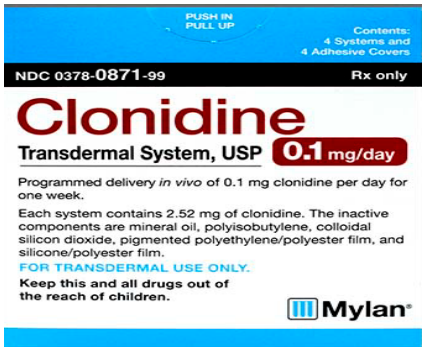
Nortriptyline

Nortriptyline was also used as a tricyclic antidepressant and found to have similar quit rates as bupropion. Recommended dosage is 0.15mg – 0.75mg per day for 3-10 weeks.

Clonidine

Clonidine, an alpha-2 adrenoceptor antagonist used in opiate and withdrawal of alcohol, has also shown some of the symptoms of withdrawal from tobacco diminished. In six trials of oral or transdermal clonidine versus placebo the combined odds ratio for effectiveness was 1.89. The recommended dosage is 75-100 mg per day for 12 weeks can be prescribed.

Withdrawal symptoms: Irritability, tiredness, insomnia, anxiety, frustration, cravings, restlessness, decreased heart rate, increased appetite or weight gain, anger, cough, dizziness, constipation, hunger, headache, depressed mood, lack of concentration.[52]



Nicotine Replacement Therapy (NRT

Method	Availability	Description
Nicotine Patches	Over-the-Counter	The nicotine patch is positioned on the skin and offers a low, steady amount of nicotine for users.
Nicotine Gum	Over-the-Counter	It chews the nicotine gum to absorb nicotine. The user chews the gum until a tingling sensation is created, then places it between their cheek and gums.
Nicotine Lozenges	Over-the-Counter	Nicotine lozenges are like hard candy and put in the mouth. The lozenge of nicotine absorbs nicotine, as it dissolves gradually in the mouth.
Nicotine Inhaler	Prescription	A nicotine inhaler is a mouthpiece fixed cartridge. Through inhaling through the mouthpiece, the patient is given a certain amount of nicotine.
Nicotine Nasal Spray	Prescription	Nicotine nasal spray is a nicotine-containing pump tube that is inserted into the nose and then sprayed.

Other Quit Smoking Medications

Method	Availability	Description
Bupropion	Prescription	Bupropion, also called Zyban, helps to reduce the withdrawal of nicotine and encourage smoking. Bupropion is safe to use with NRT.
Varenicline	Prescription	Varenicline also has known as Chantix ® helps to reduce the withdrawal of nicotine and the urge to smoke. It also blocks the effects of cigarette nicotine if the user starts smoking again.

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BENEFITS OF QUITTING[52]

The deleterious effects on oral and systemic health are diminishing slowly over time. There are many benefits of quitting tobacco:

- The risk of repeated heart attacks and cardiovascular deaths following cessation of smoking is substantially decreased (50 percent or more).
- Pulse and blood pressure drop to normal.

- Risk of mouth, throat, esophagus, bladder, kidney, and pancreatic cancer decreases. Short-term advantages include reducing the breathlessness.[53]

Benefits of quitting tobacco-Giving up tobacco have some immediate and long-term benefits

After	
20 minutes	• Blood pressure and pulse drop to a normal rate • Temperature increases to normal for hands and feet
8 hours	• Carbon monoxide levels drop to normal in the blood • Blood oxygen levels go up to normal
24 hours	• Heart attack risks continue to go down
48 hours	• Nerve endings start to develop again • Taste and smell skills continue to improve
2 Weeks to 3 months	• Circulation improves • Walking gets easier • Lung function improves up to 30%
1 month to 9 months	• Coughing, sinus congestion, respiratory fatigue, and chest tightness • Cilia (small hairs) grow back in the lungs to handle mucus better, cleanse the lungs and reduce infection
1 year	• Coronary heart disease risk is half that of smokers
5 years	• Mortality risk for lung cancer decreases by half • The risk of stroke becomes the same as a non-smoker • The risk of cancer of the mouth, throat, oesophagus, bladder, kidney, and pancreas goes down

CONCLUSION

Tobacco use remains a serious public health problem leading to the globally preventable cause of morbidity and mortality. Implementation of tobacco control measures should be strictly pursued to minimize the incidence of tobacco use and thereby increased the burden of illness and

deaths caused by tobacco use. The clear link between oral disease and tobacco use offers oral health professionals an ideal opportunity to participate in tobacco control initiatives and cessation programs. They should encourage their patients not to smoke, and reinforce the message about anti-tobacco and refer the patients to cessation services.

The government should arrange Tobacco Cessation Clinics at peripheral health centers, district hospitals, and local health centers. Ban on any form of tobacco advertisement, promotion, and sponsorship is a powerful tool for protecting people and curbing the epidemic of tobacco use. Besides, posters, brochures, and continuing patient education materials about the cessation of tobacco should be available.

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