Nicotine Addiction

A Burning Issue in Addiction Psychiatry

George Kolodner, MD, DLFAPA, FASAM[a,*],
Carlo C. DiClemente, PhD, ABPP[b,1],
Michael M. Miller, MD, DLFAPA, DFASAM[c,d,2]

KEYWORDS

• Nicotine • Addiction • Tobacco • Cigarettes • NRT • SUD • Addiction treatment
• Recovery support services

KEY POINTS

- Nicotine use is of significant importance, not just an incidental issue, when it is used along with other substances by persons with substance use disorders (SUDs).
- Addressing nicotine addiction is given relatively low priority by both the addiction treatment field and the recovery support community.
- Effective treatment of nicotine addiction is available and can be delivered without endangering overall SUD treatment outcomes.

INTRODUCTION

How does one account for the deadliest of the substance use disorders (SUDs)—nicotine addiction—still being given the least attention by many clinicians in the addiction treatment community?

Why did the documentation of the damaging effect of nicotine addiction have much less impact on reducing tobacco use in the SUD patient population than it did in the general population?

The authors wish to thank Lori Karan, William White, Neil Grunberg, Annie Kleykamp, and Joel Guydish for their generous contributions to the content of this article and also Lisa Ilium for formatting the references.

Note on terminology: In this article, the term "nicotine addiction" is used rather than the term "tobacco use disorder" because non-tobacco nicotine delivery devices (ie, electronic cigarettes) emerged after the new substance use disorders (SUDs) nomenclature was established in DSM-5.

[a] Georgetown University School of Medicine, Washington, DC, USA; [b] University of Maryland Baltimore County, Baltimore, MD, USA; [c] University of Wisconsin School of Medicine and Public Health, Madison, WI, USA; [d] Medical College of Wisconsin, Wauwatosa, WI, USA
[1] Present address: 9728 Starling Road; Ellicott City, MD 21042.
[2] Present address: 22 Settler Hill Cir, Madison, WI 53717.
* Corresponding author. 3204 Klingle Road Northwest, Washington, DC 20008.
E-mail address: georgekolodner@gmail.com

Psychiatr Clin N Am ■ (2022) ■–■
https://doi.org/10.1016/j.psc.2022.04.003 **psych.theclinics.com**

One way to start to answer these questions is by asking you, the reader, if you are unfamiliar with any of the following statements about the problems associated with nicotine addiction in the United States?

- Nicotine addiction kills as many people *every year* (approximately 480,000) as COVID-19 did in 2021 (476,433).[1] In addition, secondhand tobacco smoke annually kills 50,000 nonsmokers—15,000 more than annual deaths from alcohol impaired driving.[1]
- Even with the huge surges in opioid and other drug overdose deaths, nicotine addiction kills more than twice as many people as do all other SUDs combined.
- More people in recovery from alcohol use disorder die of nicotine addiction-related illnesses than from any other cause.[2]
- The leading cause of death among persons with an alcohol use disorder is not alcohol-related injuries and illnesses—it is medical complications (cardiovascular and pulmonary) of nicotine addiction.[3]
- SUD treatment programs rarely include nicotine addiction in their treatment plans.
- Effective medications have been approved by the FDA for nicotine addiction but are not consistently offered to patients in SUD treatment programs.
- Addiction rehabilitation programs do not permit the continued addictive use of other substances but make an exception for nicotine with patients as well as staff.

How about any of these more hopeful statements?

- Two-thirds of tobacco smokers want to quit their use,[4] and many have made multiple actual attempts at quitting. An average of 6 attempts is necessary to achieve stable abstinence, which has been achieved by more than 60% of smokers.[5–7]
- Addiction treatment programs that treat nicotine on the same basis as other substances have found either improvement or no decrease in long-term abstinence for all other addictive substances.[8,9]
- Stopping tobacco smoking leads to reduced symptoms of depressed mood and anxiety in people with or without psychiatric diagnoses.[10]

The pioneers of addiction treatment in America in the late nineteenth and early twentieth centuries were quite clear about the danger posed to overall SUD recovery by continued nicotine addiction.[11] How and why did this awareness change? In an era when clinicians aspire to practice evidence-based medicine, how is it that they commonly hold nonevidenced-based beliefs and biases such as the following:

1. Patients with SUD are not interested in stopping their use of nicotine.
2. Overall SUD recovery outcomes would be reduced by including nicotine in the treatment plan for abstinence.

This article argues that beliefs and biases such as these contribute significantly to the low priority currently being given to nicotine addiction by many addiction treatment professionals. The persistent segregation of nicotine addiction away from the treatment of all other SUDs persists despite a growing scientific literature supporting the availability of effective treatment options for nicotine addiction. This article builds on these efforts by examining some of the persistent obstacles to change and by making suggestions for ways in which they can be addressed.

A further argument will be made that treatment outcomes for nicotine addiction and cooccurring SUDs could be improved by fully integrating nicotine addiction interventions into the mainstream of addiction treatment programs. This would involve applying clinical interventions regarded as being effective for other SUDs and in which the addiction treatment workforce is already skilled.

The focus of the article is at a clinical level. Because of space limitations, the important policy level of change will only be briefly addressed. Readers interested in learning more broadly about nicotine addiction would benefit from reading a recent review by Prochaska and Benowitz.[12] For a review of treatment, the recent JAMA review by Rigotti and colleagues is recommended.[13]

SELECTED ASPECTS OF NICOTINE ADDICTION

People Exposed to Nicotine Are Highly Likely to Progress to Problematic Use

"Social" tobacco use is much less common than addicted use—the opposite of what occurs with alcohol use. This is consistent with the extensive distribution of nicotine receptors throughout the nervous system. Furthermore, because the most common route of administration is inhalation, thus providing access to the brain even more rapidly than by injection, the addictive potential of nicotine is maximized.

Nicotine Enhances the Rewarding Effect of Other Substances

Although individuals with SUD frequently use more than one substance at a time, this association is particularly common with the use of nicotine. The neurobiological explanation for this clinical finding may be an amplification effect by nicotine on other substances. Recent studies have found that the impact of cocaine on mice was increased if nicotine was given to the animals *before* the cocaine. This did not occur if the nicotine was given *after* the cocaine. The action of histone deacetylase on chromatin is inhibited by nicotine, which allows the cocaine to remain active for a longer period of time.[14–16] In addition, extensive research documents the synergistic interaction between alcohol and nicotine.[17]

Substance Use Disorder Patients Often Downplay the Importance of Their Nicotine Use

Patients focus primarily on the problems created by their "drug of choice." Clinicians are usually able to convince patients to abstain as well from what they regard as a "nonproblem" drug, such as alcohol in a patient with a cocaine use disorder, cannabis for a patient with an alcohol use disorder, and benzodiazepines for a patient with an opioid use disorder. By contrast, when clinicians suggest that nicotine be included in the abstinence treatment plan, the common patient response is "I'm not ready to do that right now." Frequently, there is no follow-up, and many addiction treatment programs fail to explore nicotine use by patients at all.

Strikingly, although the prevalence of tobacco use has fallen to 14% in the general population, rates of use in the SUD population range from 30% to 70% and in some subpopulations reach 90%.[18]

The Contribution of Nicotine Withdrawal Symptoms to Unsuccessful Quit Attempts is Underappreciated

The nicotine withdrawal syndrome is very uncomfortable for most nicotine users but it is not as physiologically debilitating and dangerous as the withdrawal syndromes for most other addictive substances. The intensity of physical and psychological withdrawal symptoms, however, result in an inability of the individual to establish and sustain abstinence. What also distinguishes nicotine from other classes of addictive drugs is the persistence of cravings for years after last use. Over time, these cravings erode determination, especially for those who attempt to quit without the use of symptom-relieving medications. (See "Using Medications More Effectively" section below on medication.)

Most People with Nicotine Addiction Recognize Nicotine to be a Problem for Them and Want to Quit Their Use

In the language of the Transtheoretical Model of the Stages of Change, many people with nicotine addiction would be considered to be in Precontemplation because they are "not seriously considering modifying addictive behavior" in the next 6 months.[19] This disinclination, however, is often due to feelings of hopelessness and helplessness because of past unsuccessful quit attempts. In contrast to people with other SUDs, denying that nicotine is a problem is less frequently the obstacle. Up to 80% of them have not only expressed a desire to quit but have actually made multiple attempts to do so.[8] They might, in fact, be better be described as being in the contemplation or preparation rather than the Precontemplation stages of change. This difference has significant clinical implications as will be discussed in section "Enhancing Psychosocial Interventions."

WHAT IS ALREADY BEING DONE

Outside of the Addiction Treatment Field

Most of the progress being made in reducing the addictive use of nicotine is attributable to the work of behavioral health experts outside of the traditional addiction treatment field. In the United States and the developed world, efforts to intervene have created a wealth of services, strategies, and products that have been successful in reducing initiation of nicotine use and promoting abstinence. A broad array of effective interventions has been developed, largely by psychologists and others, under a framework of "smoking cessation"—language that is not used in addiction treatment toward other SUDs. These interventions range from telephone Quitlines (1–800-QuitNow) to websites, from Screening, Brief Intervention, and Referral to Treatment (SBIRT)[20] to individual and group treatments, as well as support services and mutual help programs. Resources include the following:

a. For clinicians, state-of-the-art smoking cessation treatment protocols can be found at "RX for Change" [https://rxforchange.ucsf.edu/]
b. For smokers and vapers, useful support and suggestions are available at "BecomeAnEX" [https://www.becomeanex.org/]
c. Guidelines for addressing nicotine addiction have been developed by many medical groups such as the American College of Chest Physicians [https://foundation.chestnet.org/wp-content/uploads/2021/06/Tobacco_Dependence_Treatment_Toolkit_CHEST_Foundation.pdf]. Substantial resources have also been developed by public education and advocacy organizations such as the American Lung Association [https://www.lung.org/quit-smoking] and the American Cancer Society [https://www.cancer.org/cancer/cancer-causes/tobacco-and-cancer.html].

A series of groundbreaking reports from the US Surgeons General from 1964 to 2020, documenting the toxic and addictive properties of tobacco, have had a powerful effect in preventing and reducing tobacco use in the general adult and adolescent populations. In addition, significant and successful policy initiatives have increased cessation on a population basis and deterred initiation, especially among youth. These include the following:

a. Laws protecting exposure to secondhand smoke and restrictions on where and when individuals can smoke
b. Tax increases that discourage use, especially among youth
c. Restrictions on advertising, media, and depiction in movies

d. Regulations on commercial tobacco-containing products (prohibition of menthol and other flavorings in cigarettes, small cigars, and cut/smokeless tobacco) and on the quantity of nicotine in tobacco products

Within the Addiction Treatment Field

The American Society of Addiction Medicine (ASAM)—the largest professional society in America that focuses on addiction—has long assumed a leadership role regarding nicotine addiction. Beginning with the pioneering efforts of the late John Slade and Richard Hurt and in the mid-1980s, ASAM pressed for increased attention from clinicians and action from policy makers. More details are available in a recently compiled book titled *Treat Addiction Save Lives: The History of ASAM* [*In Press*]. In 2022, in collaboration with the Smoking Cessation Leadership Center of UCSF [*https://smokingcessationleadership.ucsf.edu/*], ASAM issued the guidance "Integrating Tobacco Cessation Interventions in Addiction Treatment" [*https://www.asam.org/quality-care/clinical-guidelines/tobacco*].

Two examples of policy change at a state level to bring nicotine addiction treatment into traditional addiction treatment have occurred recently. In New York State, the Office of Alcohol and Addiction Services adopted regulations that required residential addiction treatment programs to integrate nicotine addiction into diagnostic evaluations at intake and into individualized treatment plans. In 2021, the California Society of Addiction Medicine helped to craft a law that required SUD treatment programs in that state to integrate into their care plans the treatment of nicotine addiction [https://a24.asmdc.org/press-releases/20210901-governor-newsom-signs-bill-integrate-tobacco-treatment-substance-use].

ADDRESSING OBSTACLES TO CHANGE

Addiction Treatment Field

Studies are minimal that would explain the exception usually made for nicotine by SUD rehabilitation programs to the standard requirement for abstinence from the addictive use of all substances during treatment. This section is, therefore, based on the personal observations of the authors.

The reluctance of SUD patients to discontinue nicotine use is frequently reinforced by the recommendation from their 12-step supporters that doing so would be dangerous to their recovery efforts (see "12-Step Mutual Help Community" section below). Clinicians are likely to defer to this combination of forces if they do not know of the well-done studies documenting better treatment outcome for all substances when nicotine use is also stopped.[21] Other studies indicate that continued addictive nicotine use is associated with increased SUD relapse risk.[22] One of the goals of this article is to increase awareness of these studies.

In addition, clinicians sometimes lack confidence in dealing effectively with nicotine addiction, despite the reality that the interventions with which they are already familiar about other SUDs, such as motivational interviewing and CBT, are fully applicable to nicotine addiction. Furthermore, lack of experience with the medication protocols described in "Using Medications More Effectively" section below leaves them unaware of how effective these medications can be.

Vignette 1

A 52-year-old woman, who was admitted to an intensive outpatient addiction treatment program for an alcohol use disorder, smoked her first cigarette in 20 years during a smoking break in that program's daily treatment schedule.

This particularly unfortunate consequence of the nicotine exception is familiar to many clinicians who work in outpatient and inpatient rehabilitation programs. Breaks during the treatment schedule are important opportunities for patients to have informal social interactions with each other. Because these times are used by many patients to smoke cigarettes, nonsmokers wanting to be included socially are at risk to begin or resume their nicotine use during these breaks. Staff smoking—particularly staff smoking with patients—further increases the difficulty for patients who are attempting to abstain from smoking.[23]

Most states have adopted indoor Clean Air Acts, which prohibit smoking in public indoor facilities. Although some states initially enacted such laws with specific exceptions for addiction and psychiatric treatment facilities, such exceptions are now rare. The Joint Commission, which accredits many health-care organizations, has standards that address tobacco use among patients. Some organizations find that the goal of tobacco-free grounds is still difficult to implement and enforce. A recent study, however, indicated that tobacco-free grounds in SUD programs in California demonstrated more use of nicotine replacement therapy (NRT) and a significant decrease in smoking prevalence by patients.[24]

Optimally, these types of initiatives are linked to a comprehensive approach to patients' use of nicotine. This could include screening, identification of high-risk use situations, referral for counseling, access to nicotine replacement and other appropriate medications, eliminating "smoking" breaks in the daily schedule, and enforcement of policies regarding smoking. Efforts to help staff to quit smoking could also be included.[25]

If total smoke-free efforts are not feasible, creating welcoming spaces comparable to "smoking areas" with alternative activities and smoke-free opportunities for socialization for those trying to become or remain abstinent would support those efforts.

12-Step Mutual Help Community

Vignette 2

A 55-year-old man, who was 10 years in recovery from an alcohol use disorder, decided to enter a nicotine addiction treatment program because he had returned to smoking cigarettes after having a lobe of his lung removed due to cancer. He followed through on this decision despite being warned by his sponsor that stopping his tobacco use could jeopardize his alcohol recovery.

Why do so many of the members of the 12-step recovery community advise delaying addressing tobacco use despite the fact that it was responsible for the death of the cofounders of Alcoholics Anonymous as well as other pioneers of the recovery movement?

One source of the widely held belief that addressing nicotine addiction presents a threat to alcohol recovery can be found at the end of "The Family Afterward" chapter in "The Big Book" of Alcoholics Anonymous.[26] That section describes a man who, although successfully abstaining from alcohol, continued heavy use of tobacco and coffee:

"His wife believed that 'there is something rather sinful about these commodities, so she nagged, and her intolerance finally threw him into a fit of anger. He got drunk.'" The vignette concludes that the man had to "painfully admit" that he was wrong and "Though he is now a most effective member of Alcoholics Anonymous, he still smokes and drinks coffee, but neither his wife nor anyone else stands in judgment. She sees that she was wrong to make a burning issue out of such a matter when his more serious ailments were being rapidly cured."

Written by AA cofounder Bill Wilson,[27] this anecdote is still influential with AA members. Tobacco use was equated with coffee and was considered as not germane to the person's efforts to stop drinking. Wilson's own life provides a contrast to his assertion that nicotine addiction was not a "burning issue." His cigarette use resulted in severe Chronic Obstructive Pulmonary Disease (COPD). He also suffered from major depression, which he was able to relieve by taking long walks. When his COPD became too severe for him to exercise, he lapsed back into a painful depression that lasted to the end of his life.[28] He was not alone; other

pioneers such as AA co-founder Dr Bob Smith and Marty Mann, the founder of the National Council on Alcoholism, died of medical consequences of their nicotine addiction.

Although indoor smoking bans have eliminated smoke-filled 12-step meetings, outdoor smoking is common during meeting breaks. Suggestions that "sobriety dates" be determined by the last use of nicotine are unpopular and can be met with hostility.

The critical element of support from mutual help organizations has largely been missing for people struggling with nicotine addiction, meetings of Nicotine Anonymous being less available than those for other substances.

Health Insurance Coverage

Why do insurance companies exclude coverage for psychological interventions for nicotine addiction despite their willingness to pay for treatment later for the extensive medical consequences of tobacco use?

The cost for effective treatment of SUDs is usually beyond the means of the typical patient, making third party coverage essential. Insurance coverage has lagged for all SUDs—a problem addressed by the Mental Health Parity and Addiction Equity Act.[29] Regarding nicotine addiction, however, the payers continue to refuse to provide the coverage for "tobacco use disorder" that is afforded to other SUDs. Brief counseling interventions are sometimes reimbursed but not more substantial counseling or psychoeducational group activities that are necessary for better treatment outcomes.

Almost all plans include coverage for prescription medications but not for over-the-counter patches, lozenges, and gum. Initially, however, even medication coverage was resisted by some health insurance companies. When bupropion was granted an FDA indication for smoking cessation in the late 1990s,[30] it was marketed for that purpose as "Zyban." Some insurance companies not only refused to pay for Zyban but also required any clinician prescribing brand name "Wellbutrin" to certify that it was being used for depression and not for "smoking cessation."

Broader access to NRT is limited because the inhaler and nasal spray are only available by prescription. However, the requirement to self-pay for over-the-counter products can create financial obstacles. In some states, fortunately, the cost is covered by Medicaid or state-subsidized programs.

MORE THAT CAN BE DONE CLINICALLY

Some clinical interventions that are basic to the treatment of other SUDs have not been consistently applied to the treatment of nicotine addiction. Applying the following interventions could improve treatment outcomes.

Enhancing Psychosocial Interventions

Focusing on patient feelings of resignation regarding addressing their addiction to nicotine

When a patient is in Precontemplation because of discouragement about past failed quit attempts, a different treatment strategy would be in order than if the patient doubted that nicotine was a problem. For example, the clinician could point out that multiple quit attempts are the norm and that as the number of quit attempts increases, the probability of success at achieving and sustaining abstinence from nicotine use also increases. Furthermore, if previous attempts were not well organized and did not incorporate the proper use of medication, appropriate instructions from the clinician can increase the likelihood of a successful attempt.

Understanding the underlying obstacle as being resignation rather than "denial" may help clinicians to be more hopeful about the prognosis of these patients. As a result, they would be more likely to incorporate interventions addressing nicotine addiction into their regular repertoire of addiction treatment interventions.

Intensifying patient ambivalence about their nicotine use

Within the motivational interviewing approach, a clinical intervention that intensifies the ambivalence that characterizes the Contemplation stage of change can facilitate progression to the Preparation stage. Patients often downplay the importance of their nicotine addiction by focusing on the danger that accompanied being intoxicated by alcohol or obtaining illegal drugs. A useful way to address this tendency is to ask a patient "What is the wildest thing you have done to get a cigarette or a vape?" (Lori Karan, Personal Communication, 2022). The sometimes-startling answer can elevate patients' awareness of the significant role that nicotine has assumed in their lives.

Using more intensive levels of treatment

Increased intensity and structure of psychosocial interventions have been essential to improving outcomes in traditional SUD treatment. A chapter in the current edition of the ASAM Criteria[31] reviews what these traditional levels of addiction treatment might look like if the addiction treatment delivery system were reengineered to address nicotine addiction. Residential treatment (ASAM Criteria Level 3) is rarely available for nicotine addiction and intensive outpatient and partial hospitalization (ASAM Criteria Level 3) are nonexistent.[32] Providing a remedy for this vacuum, however, would require a change in insurance coverage as mentioned in "Health Insurance Coverage" section above.

Using Medications More Effectively

Medications are available to substantially reduce or eliminate nicotine withdrawal symptoms, including craving. Most people with nicotine addiction, however, attempt to quit without using any medications, thereby decreasing the likelihood of success. Many patients have not had positive experiences using medications and are, therefore, highly skeptical that their withdrawal symptoms can be adequately relieved. They tend, at the same time, to be accepting of exaggerated reports about the side effects of medication or the prospect of medication causing nicotine toxicity. In addition, some patients try to use the gum or lozenges without proper instructions and get discouraged with the disappointing results.

Anticipation of the expected discomfort of withdrawal is a significant deterrent to patients' willingness to address their nicotine addiction. Patients who are informed about the effectiveness and safety of properly dosed medications and then personally witness the relative comfort of well-medicated patients may be more willing to use these medications.

Some considerations are as follows:

a. *Dosing*. These medications are often used in inadequate doses. Regarding the nicotine patch, for example, 1 mg of patch is approximately equivalent in nicotine content to one cigarette. Therefore, if a patient is smoking 1 1/2 packs per day, the appropriate initial patch strength would be to use 2 patches—one of 21 mg and one of 14 mg. These initial doses can be adjusted higher or lower depending on the patient response.

Medication combinations. Many clinicians continue to use only a single medication despite randomized studies demonstrating the effectiveness of using a combination of longer-acting and shorter-acting medications[33–37] as well as by

recommendations in a recent JAMA review.[13] One example of this approach, developed at the Mayo Clinic (Dr Taylor Hays, Personal Communication, 2022), suggests that patients using more than 10 cigarettes daily take varenicline for 2 weeks and then use a patch daily, beginning on the evening before the first day of stopping cigarette use. If cravings persist, a short-acting agent such as gum or lozenges can be added. Variations include omitting varenicline, just using the patch and short-term agents. However, if outcomes have been poor, bupropion and varenicline can be given concurrently.

b. *Proper use of oral products*. Patients need education about oral NRT. Nicotine is a nitrogen-containing molecule with a basic pH. For optimum absorption across the membranes of the oral mucosa, the oral cavity must not be an acidic pH environment because the nicotine will ionize and not cross the membranes. Patients need to be educated on avoiding acidic products such as carbonated beverages, fruit juices, tea, and dairy products immediately before using the gum or a lozenge.

   Patients also need to keep nicotine-containing saliva in their mouth for 30 seconds, to "feel the tingling," and allow for oral absorption. If they swallow the nicotine-containing saliva, instead of the nicotine being absorbed and reaching the bloodstream then the brain, it will enter the stomach where hydrochloric acid will completely ionize it—but often not without some gastric irritation and dyspepsia from the nicotine itself.

c. *Duration of use*. Medications tend to be discontinued prematurely. Package inserts for patches recommend tapering doses at a rate that might not match individual differences. Furthermore, the common practice in SUD treatment of using medications for months or years for relapse prevention is not done in the treatment of nicotine addiction. Although gum and lozenges are used as needed for extended periods of time, varenicline is rarely used for more than several months. Interestingly, the one study looking at longer term use of varenicline found improved outcomes.[38] A substantial change in this clinical practice would probably require changing the FDA packaging, which is not worded in the same way as it is for longer term use in OUD and AUD.

Expanding Newer Interventions

Effective SUD treatment using virtual technology has become routine since regulatory barriers were lowered during the Spring of 2020 because of the COVID-19 epidemic. For nicotine addiction, treatment outcomes equivalent to in-person settings have been achieved by using telehealth interventions that incorporated contingency management.[39] Devices to measure breath carbon monoxide remotely are available and can be used effectively to motivate current smokers as well as to provide accountability for those in treatment.

MORE THAT CAN BE DONE IN THE MUTUAL HELP COMMUNITY

1. Within the 12-step recovery community, signs of a change in culture are emerging. Written largely by people in long-term personal recovery, "A Time to Lead: The Case for Integrating Treatment of Tobacco Use Disorder in the Treatment of Other Substance Use and Mental Health Disorders"[40] is a comprehensive analysis and a "call to action" for members of the mutual help community, as well as for professional organizations.
2. Non-12-step recovery support programs, such as Self-Management and Recovery Training (SMART) Recovery, explicitly include nicotine in the array of other

addictive substances and have specific interventions described on their websites [https://www.smartrecovery.org/addiction-recovery/stop-smoking; https://www.smartrecovery.org/tips-to-quit-smoking]
3. A large recovery community in Iran, "Congress 60," initially limited its focus to opioid addiction. When the founder—a heavy cigarette smoker—experienced a near fatal heart attack, he stopped using cigarettes and has been working with some success to convince all members of his organization to follow suit.[41]

ELECTRONIC CIGARETTES

This topic is included, despite the limited consensus that surrounds it, because it has already assumed a significant role in the issue of nicotine addiction and will likely play an even larger role in the future. E-cigarettes, also known as electronic nicotine delivery systems or "vapes," arrived in the United States in 2007 and were promoted by manufacturers, with no evidence, as a possible tool to exit from nicotine addiction. There is considerable controversy about whether e-cigarettes are in fact helpful or whether they will exacerbate the problem of nicotine addiction. Differences in their use by youth, with no history of tobacco use, versus by older cigarette smokers, who are already addicted to nicotine, further complicate the debate.

Supporters argue that e-cigarettes:

1. Lack the toxic products from tobacco combustion, making them safer than cigarettes
2. Have a potential for helping people abstain entirely from tobacco use (an approach explicitly endorsed by the National Health Service in the United Kingdom)

Critics, including the regular reports of AMA Council on Science and Public Health on e-cigarettes, argue that e-cigarettes:

1. Contain toxic chemicals of unknown kind and quantity in the vaping fluid and the long-term health effects of these are unknown
2. Are introducing young people to nicotine, leading to addiction and transition to tobacco use
3. Are often used in combination with cigarettes instead of as an alternative.

One response to patients who ask about the advisability of shifting from tobacco cigarettes to e-cigarettes would be to emphasize the importance of making a total shift while being clear that the safety of the e-cigarettes has not been established.

Adolescents who vape are 3 times more likely to initiate cigarette smoking than do adolescents who do not vape.[42] A familiar tension point around underage use has developed between regulators and manufacturers. With adolescents and young adults providing an eager market, manufacturers strive to satisfy those demands. A nicotine delivery system has been designed which is as addictive or perhaps more addictive than cigarettes. Some brands of e-cigarettes deliver high-nicotine content in chemical forms that maximize delivery deep into the lungs where the nicotine is readily carried by the pulmonary vascular circuit to the brain. By adding flavorings and reducing the harshness of the inhaled aerosol, manufacturers have succeeded in making e-cigarette use very popular with teenagers and young adults.

Their success has led to a dramatic increase in vaping by high school students. Fortunately, the sharp increases seen between 2017 and 2019 leveled off in 2020 and decreased significantly in all grades in 2021, according to the NIDA-sponsored Monitoring the Future survey. Nevertheless, vaping continues to be the predominant

method of nicotine consumption among young people—more teens vape than smoke.[43] A recent study found that for adolescents, stopping the use of e-cigarettes is even more difficult than stopping traditional cigarettes.[44]

Interventions by government regulators in response to this use have included restricting the flavorings for nondisposable devices. E-cigarette manufacturers responded by finding loopholes that allow them to maintain the popular flavorings in disposable devices.

The trend for workplaces and schools to establish "tobacco-free" grounds creates an incentive for the clandestine use of e-cigarettes.[45] Devices are designed to not resemble cigarettes but rather to look like objects such as flash drives, watches, or pens and to emit small amounts of visible material—mostly water vapor.[46] They are small enough to be hidden in a sleeve or concealed within the palm of the hand and brought out in a way that avoids detection. Videos are available online with instructions about how youthful users can hide vapor by swallowing or exhaling it surreptitiously.

The complexity of this issue is illustrated by a recent authorization decision by the FDA to allow the marketing of a few e-cigarette products [https://www.fda.gov/news-events/press-announcements/fda-permits-marketing-e-cigarette-products-marking-first-authorization-its-kind-agency]. Although not declaring the product to be safe, they judged that the products "could benefit addicted adult smokers who switch to these products" without unduly endangering youth.

Because of how rapidly this field is changing, research data is limited, and references are quickly outdated. For a summary of the most recent developments, readers are referred to these websites:

- NIDA [https://www.drugabuse.gov/publications/research-reports/tobacco-nicotine-e-cigarettes/what-are-electronic-cigarettes]
- CDC: https://www.cdc.gov/tobacco/basic_information/e-cigarettes/about-e-cigarettes.html
- NIOSH [https://www.cdc.gov/niosh/topics/tobacco/electronicnicotinedeliverysystems.html].

SUMMARY

SUD patients with nicotine addiction discourage clinicians from addressing their nicotine use for at least 2 reasons. First, they are in, or have returned to, a Precontemplative stage of change because, discouraged by their previous unsuccessful attempts to stop using nicotine, they are resigned to the idea that no effective treatment exists. Second, they accept warnings of other members of the recovery community that to stop their use of nicotine would jeopardize their overall recovery.

Addiction clinicians tend to focus their therapeutic efforts in directions where they believe they can make a difference. They would perhaps be more perseverant in addressing nicotine addiction if they were more aware of the evidence that contradicts the inaccurate cultural beliefs within the recovery community. Furthermore, clinicians would achieve better treatment outcomes if their motivational strategy was directed toward patient discouragement, and they used a more aggressive protocol with medications. Support by the insurance community of higher-intensity treatment would lead to even better clinical results.

The recent emergence of e-cigarettes has complicated the issue of nicotine addiction and reinforced the importance of increasing professional attention to this problem.

CLINICS CARE POINTS

- Part of any treatment plan for SUD patients with cooccurring nicotine addiction should include a concrete plan for when and how the nicotine addiction will be addressed.
- Inaccurate beliefs in the recovery community about the danger of addressing nicotine addiction need to be energetically addressed.
- Efforts to motivate patients to address their nicotine addiction should be directed toward patient discouragement about unsuccessfulpast abstinence attempts.
- Better outcomes could be achieved by:
  - Using psychosocial interventions that have been effective in the treatment of other SUDs.
  - Using medications in adequate doses and in combinations for withdrawal management, as well as continuing their use for months or years if necessary for relapse prevention.
- Better treatment outcomes could increase the likelihood that addiction medicine specialists would address nicotine addiction.

DISCLOSURE

The authors have no commercial relationships related to the content of this article.

REFERENCES

1. National Center for Chronic Disease Prevention and Health Promotion (US) Office on Smoking and Health. The health consequences of smoking—50 Years of progress: a report of the Surgeon general. Atlanta (GA): Centers for Disease Control and Prevention (US); 2014.
2. Hurt RD, Offord KP, Croghan IT, et al. Mortality following inpatient addictions treatment. Role of tobacco use in a community-based cohort. JAMA 1996;275(14): 1097–103.
3. Bandiera FC, Anteneh B, Le T, et al. Tobacco-related mortality among persons with mental health and Substance Abuse problems. PLoS One 2015;10(3). https://doi.org/10.1371/journal.pone.0120581.
4. Babb S, Malarcher A, Schauer G, et al. Quitting Smoking Among Adults - United States, 2000-2015. MMWR Morb Mortal Wkly Rep 2017;65(52):1457–64.
5. Chaiton M, Diemert L, Cohen JE, et al. Estimating the number of quit attempts it takes to quit smoking successfully in a longitudinal cohort of smokers. BMJ open 2016;6(6):e011045.
6. Hughes JR, Solomon LJ, Naud S, et al. Natural history of attempts to stop smoking. Nicotine Tob Res 2014;16(9):1190–8.
7. Creamer MR, Wang TW, Babb S, et al. Tobacco Product Use and Cessation Indicators Among Adults - United States, 2018. MMWR Morb Mortal Wkly Rep 2019;68(45):1013–9.
8. Prochaska JJ, Delucchi K, Hall SM. A meta-analysis of smoking cessation interventions with individuals in substance abuse treatment or recovery. J Consult Clin Psychol 2004;72(6):1144–56.
9. Thurgood SL, McNeill A, Clark-Carter D, et al. A Systematic Review of Smoking Cessation Interventions for Adults in Substance Abuse Treatment or Recovery. Nicotine Tob Res 2016;18(5):993–1001.
10. Taylor G, McNeill A, Girling A, et al. Change in mental health after smoking cessation: systematic review and meta-analysis. BMJ 2014;348:g1151 [published correction appears in BMJ. 2014;348:g2216].

11. White W. Slaying the dragon: the history of addiction treatment and recovery in America. 2nd edition. Bloomington: Chestnut Health Systems; 2014.
12. Prochaska JJ, Benowitz NL. Current advances in research in treatment and recovery: Nicotine addiction. Sci Adv 2019;5(10):eaay9763.
13. Rigotti NA, Kruse GR, Livingstone-Banks J, et al. Treatment of Tobacco Smoking: A Review. JAMA 2022;327(6):566–77.
14. Kandel E. Investigating the Paradigm that Nicotine Boosts the Effects of Cocaine (66/80) [Video]. YouTube. 2017. Available at: https://www.youtube.com/watch?v=Yz34-3H6TJo&t=16s. Accessed February 20, 2022.
15. Levine A, Huang Y, Drisaldi B, et al. Molecular mechanism for a gateway drug: epigenetic changes initiated by nicotine prime gene expression by cocaine. Sci Transl Med 2011;3(107):107ra109.
16. Kandel ER, Kandel DB. Shattuck Lecture. A molecular basis for nicotine as a gateway drug. N Engl J Med 2014;371(10):932–43.
17. Morel C, Montgomery S, Han MH. Nicotine and alcohol: the role of midbrain dopaminergic neurons in drug reinforcement. Eur J Neurosci 2019;50(3):2180–200.
18. Chou SP, Goldstein RB, Smith SM, et al. The Epidemiology of DSM-5 Nicotine Use Disorder: Results from the National Epidemiologic Survey on Alcohol and Related Conditions-III. J Clin Psychiatry 2016;77(10):1404–12.
19. DiClemente CC. Addiction and change: how addictions develop and addicted people recover. 2nd edition. New York: The Guilford Press; 2018.
20. Screening, Brief Intervention, and Referral to Treatment (SBIRT): An Efficacious Public Health Approach to Substance Use Prevention and Treatment. In: Ciminni D, Martin J, editors. Screening, brief intervention, and referral to treatment for substance use: a practitioner's guide. Washington, DC: American Psychological Association; 2020.
21. Schroeder SA, Clark B, Cheng C, et al. Helping Smokers Quit: The Smoking Cessation Leadership Center Engages Behavioral Health by Challenging Old Myths and Traditions. J Psychoactive Drugs 2018;50(2):151–8.
22. Weinberger AH, Platt J, Esan H, et al. Cigarette Smoking Is Associated With Increased Risk of Substance Use Disorder Relapse: A Nationally Representative, Prospective Longitudinal Investigation. J Clin Psychiatry 2017;78(2):e152–60.
23. Guydish J, Le T, Hosakote S, et al. Tobacco use among substance use disorder (SUD) treatment staff is associated with tobacco-related services received by clients. J Subst Abuse Treat 2022;132. https://doi.org/10.1016/j.jsat.2021.108496.
24. McCuistian C, Kapiteni K, Le T, et al. Reducing tobacco use in substance use treatment: An intervention to promote tobacco-free grounds. J Subst Abuse Treat 2022;135:108640.
25. Marynak K, VanFrank B, Tetlow S, et al. Tobacco Cessation Interventions and Smoke-Free Policies in Mental Health and Substance Abuse Treatment Facilities - United States, 2016. MMWR Morb Mortal Wkly Rep 2018;67(18):519–23.
26. Anonymous. Alcoholics anonymous: the Big book. 4th edition. New York: Alcoholics Anonymous World Services, Inc; 2001.
27. Schaberg W. The writing of the Big book. Las Vegas: Central Recovery Press; 2020.
28. Cheever S. My name is Bill: Bill Wilson: his life and the creation of Alcoholics anonymous. New York: Simon & Schuster; 2004.
29. Centers for Medicare and Medicaid Services. The Mental Health Parity and Addiction Equity Act (MHPAEA). Available at: https://www.cms.gov/CCIIO/

Programs-and-Initiatives/Other-Insurance-Protections/mhpaea_factsheet. Accessed January 29, 2022.
30. Hurt RD, Sachs DP, Glover ED, et al. A comparison of sustained-release bupropion and placebo for smoking cessation. N Engl J Med 1997;337(17):1195–202.
31. Mee-Lee D. The ASAM Criteria : treatment for addictive, substance-related, and Co-occurring conditions. 3rd edition. Chevy Chase (MD): American Society of Addiction Medicine; 2013.
32. Williams JM, Steinberg ML, Kenefake AN, et al. An Argument for Change in Tobacco Treatment Options Guided by the ASAM Criteria for Patient Placement. J Addict Med 2016;10(5):291–9.
33. Lindson N, Chepkin SC, Ye W, et al. Different doses, durations and modes of delivery of nicotine replacement therapy for smoking cessation. Cochrane Database Syst Rev 2019;4:CD013308.
34. Steinberg MB, Greenhaus S, Schmelzer AC, et al. Triple-combination pharmacotherapy for medically ill smokers: a randomized trial. Ann Intern Med 2009;150(7):447–54.
35. Koegelenberg CFN, Noor F, Bateman ED, et al. Efficacy of Varenicline Combined With Nicotine Replacement Therapy vs Varenicline Alone for Smoking Cessation. A Randomized Clinical Trial. JAMA 2014;312(2):155–61.
36. Jon O, Ebbert JO, Dorothy K, et al. Combination Varenicline and Bupropion SR forTobacco-Dependence Treatment in Cigarette Smokers. A Randomized Trial. JAMA 2014;311(2):155–63.
37. Baker TB, Piper ME, Smith SS, et al. Effects of Combined Varenicline With Nicotine Patch and of Extended Treatment Duration on Smoking Cessation: A Randomized Clinical Trial. JAMA 2021;326(15):1485–93.
38. Evins AE, Cather C, Pratt SA, et al. Maintenance treatment with varenicline for smoking cessation in patients with schizophrenia and bipolar disorder: a randomized clinical trial. JAMA 2014;311(2):145–54.
39. Kurti AN, Tang K, Bolivar HA, et al. Smartphone-based financial incentives to promote smoking cessation during pregnancy: A pilot study. Prev Med 2020;140:106201.
40. Wrich JT, Macmaster D. The Case for integrating treatment of tobacco use disorder in the treatment of other substance use and mental health disorders. 2nd ed 2008. Available at: https://archive.hshsl.umaryland.edu/bitstream/handle/10713/14004/A%20TIME%20TO%20LEAD%20SECOND%20EDITION%20FINAL%20PDF%20%20NOVEMBER%201%202018._%20%283%29.pdf?sequence=1&isAllowed=y. Accessed January 29, 2022.
41. White WL, Daneshmand R, Funk R, et al. A Pilot Study of Smoking Cessation within an Iranian Addiction Recovery Community. Alcohol Treat Q 2016;34(1):15–29.
42. Chaffee BW, Watkins SL, Glantz SA. Electronic Cigarette Use and Progression from Experimentation to Established Smoking. Pediatrics 2018;141.
43. National Institute on Drug Abuse. Monitoring the Future. December 15, 2021. Available at: https://nida.nih.gov/drug-topics/trends-statistics/monitoring-future. Accessed January 23, 2022.
44. Miech R, Leventhal AM, O'Malley PM, et al. Failed Attempts to Quit Combustible Cigarettes and e-Cigarettes Among US Adolescents. JAMA 2022;327(12):1179–81.

45. Russell AM, Yang M, Barry AE, et al. Stealth Vaping Among College Students on Four Geographically Distinct Tobacco-Free College Campuses: Prevalence and Practices. Nicotine Tob Res 2022;24(3):342–8.
46. Edwards E. Vaping illness epidemic shows no sign of slowing. 2019. Available at: https://www.nbcnews.com/health/vaping/vaping-illness-epidemic-shows-no-sign-slowing-n1064546. Accessed January 5, 2022.