



# **Behavioral Health Population**

# Mental Illness/Mental Health Issues/Serious Mental Illness

Despite advances in lowering the rate of tobacco use and its health consequences, certain groups have not benefitted from this progress. Chief among them have been persons with mental illness and/or substance use disorders, collectively known as the behavioral health population.<sup>1</sup>

The facts and resources cited below are sorted by:

- Mental Illness/Mental Health Issues
- Addiction/Alcoholism/Illicit Drug Use Disorder/Substance Use Disorder
- Opioid Use Disorders

Many of the resources and information can be used across these sometimes distinct and sometimes overlapping populations.

In addition, a table of prescription behavioral health medications that are impacted by nicotine is included at the end of the document.

Within this document the nomenclature used for the priority population reflects the original source material.



## Why it Matters

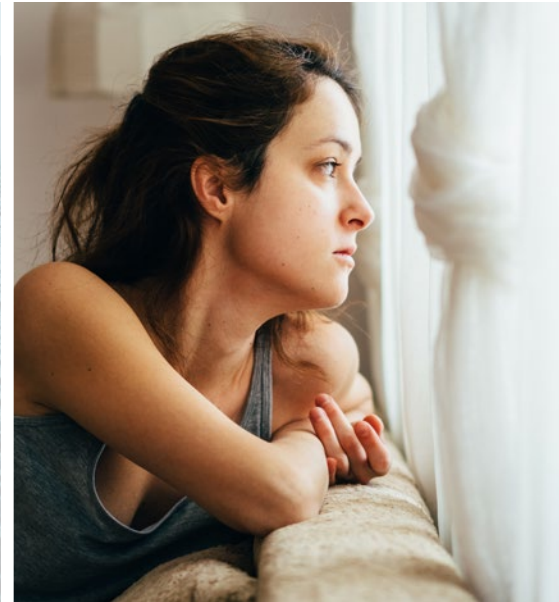
- In 2017, despite the national cigarette smoking rate being 14% overall among adults, it was 23% for individuals with a behavioral health disorder.<sup>2</sup>
- Approximately one in four adults in the U.S. has some form of behavioral health condition, and these adults consume almost 40% of all cigarettes smoked by adults.<sup>3</sup>
- Mental illness not only is an independent risk factor for smoking but is associated with a number of smoking-related risk factors, including experiencing higher poverty, lower educational attainment, and lower levels of employment.<sup>4</sup>
- Lifetime smoking rates are higher in patients who are diagnosed with major depressive disorder (59%), bipolar disorder (83%), or schizophrenia and other psychotic disorders (90%) compared to 32% among adults with no diagnosis of mental illness.
  - Individuals with a diagnosis of post-traumatic stress disorder (PTSD) are about 22% more likely to be current smokers than individuals without PTSD.

- Current smokers with a lifetime history of experiencing depression, anxiety, anxiety with depression or major depression smoke more cigarettes, smoke more frequently and have a higher level of dependence.
- Individuals with social anxiety are more likely to engage in heavy smoking and are less likely to quit successfully compared to individuals who are not experiencing social anxiety, depression, and substance use disorders.
- The presence or history of depression is associated with greater smoking severity and poorer smoking outcomes. Major depressive disorders are associated with an earlier age of cigarette smoking, greater dependence on nicotine, higher nicotine withdrawal scores, greater cravings, and higher carbon monoxide levels during cessation treatment<sup>5</sup>
- People with schizophrenia have the highest prevalence of smoking (70%–80%)—with rates up to five times higher than the general population.<sup>6</sup>
- Reasons people with mental illness smoke more:
  - The way cells and circuits work in the brains of people with mental illness may increase the likelihood of using and becoming addicted to nicotine, making it more difficult to quit.
  - Nicotine affects brain chemicals, like dopamine, and may cause some people to experience fewer symptoms of mental illness (particularly the negative symptoms of schizophrenia).
  - Nicotine helps concentration which may appeal to people whose experience with mental illness or medications affects their ability to think.
  - The act of smoking may help people feel relaxed or relieve stress and anxiety (although science points to the contrary).
  - Being around other people receiving mental health treatment who smoke may make it seem like a normal or popular thing to do and make a person feel like they are part of a group.
  - People with mental health problems often have difficulty accessing resources to quit smoking<sup>7</sup>
- Within behavioral health treatment facilities, approximately 80%–90% of clients smoke cigarettes. In addition, there is a 25-year mortality gap between people with behavioral health conditions and the general population.<sup>8</sup>
- People who have a serious mental illness are twice as likely to live in a neighborhood with more tobacco retailers and more advertisements for tobacco products. This is one reason why adults with a mental illness are more likely to smoke than adults without these disorders.<sup>9</sup>

## What We Know About What Works

- Like other people who smoke, people with a mental illness who smoke are interested in quitting, are able to quit, and have a better chance of quitting successfully when they have access to proven cessation treatments.<sup>10</sup>
- With careful monitoring, quitting smoking does not interfere with treatments for mental illness and can be part of the treatment.<sup>11</sup>
- People with mental illness face challenges in quitting smoking and may benefit from extra help to succeed in quitting. This can include more counseling as well as longer use or a combination of stop-smoking medicines.<sup>12</sup>
- Treating tobacco dependence is effective in patients with severe mental illness (SMI). Treatments that work in the general population work for those with SMI and appear approximately equally effective. Treating tobacco dependence in patients with stable psychiatric conditions does not worsen their mental states.<sup>13</sup>
- A pilot project that delivered a tailored intervention to quitline callers who reported mental health conditions showed these callers had high levels of comorbidity and serious mental illness, including a high rate of bipolar disorder (nearly 60%).
  - The pilot showed that it is possible to recruit callers into a tailored program and offer and deliver a more robust regimen of Nicotine Replacement Therapy (NRT) and more coaching calls.
  - Those in the pilot of the tailored protocol received twice as many coaching calls compared to standard program participants.
  - Nearly 90% of the pilot sample reported using NRT at follow-up (80% were shipped NRT).
  - These factors work synergistically; offering NRT helps initially engage people who smoke in treatment and multiple NRT shipments can increase engagement in follow-up calls, giving callers exposure to the behavioral components of treatment.<sup>14</sup>

- The American Psychiatric Association clinical practice guidelines, in place since 1996, recommend that providers should screen every patient with a psychiatric disorder for tobacco use and provide those interested in quitting with evidence-based treatments such as behavioral counseling and medications.
  - Mental health providers, however, have often not addressed tobacco use, believing that quitting smoking would exacerbate patients' conditions or that discussions about tobacco use would best be handled by primary care providers. These beliefs increasingly need to be countered and suggest that tobacco cessation can play a role in an overall treatment plan.
  - Mental health clinicians, with their expertise in behavior change and addictions, are also uniquely positioned to counsel patients on the process of quitting and in helping them develop alternate coping strategies.
  - Tobacco cessation is critical for ensuring optimal physical and mental health and all providers should develop skills to help their patients achieve abstinence from tobacco products.<sup>15</sup>
- Brief digital interventions garnered results similar to those found in previous studies of in-person motivational interventions among people who smoke and have SMIs. Technology-delivered tobacco treatments could provide brief or long-term cessation skills training and cessation support, which could augment or replace in-person interventions for this population, as has been shown to be effective for the treatment of addiction in the general population.<sup>16</sup>
- In patients with comorbid psychiatric conditions, varenicline is strongly recommended as first-line treatment, because trials did not show excess neuropsychiatric events.<sup>17</sup>
- People who take medications for a mental illness may need adjustments to medication dosages after they quit smoking<sup>18</sup> and should work closely with their doctors (see prescription drug table at end of section for additional information).
- People with comorbid conditions who smoke are motivated to quit and respond to evidence-based smoking cessation treatments. Talking points specific for people with mental health disorders would include that tobacco cessation would:<sup>19</sup>
  - Improve mental health
  - Decrease anxiety/depression
  - Improve overall mood<sup>20</sup>



## What's Relevant in Pennsylvania

- During 2013–2017, the annual average prevalence of past-year SMI in Pennsylvania was 4.0% (or 396,000), similar to both the regional average (4.0%) and the national average (4.2%).<sup>21</sup>
- In Pennsylvania, 37% of adults reporting poor mental health are current smokers.<sup>22</sup>
- Only 43% of mental health treatment facilities and 58% of substance use treatment facilities in Pennsylvania use Ask-Advise-Refer brief intervention to screen and refer patients to services.<sup>23</sup>
- In state fiscal year 2018, the Pennsylvania Department of Health (DOH) Division of Tobacco Prevention and Control formally identified tobacco use among people with behavioral health conditions as a key health disparities priority. DOH first developed a behavioral health logic model and incorporated behavioral health into work statements for contractors at the regional level. This logic model and work statements are continually used to guide planning and track progress toward desired outcomes. Four key areas were identified:
  - Healthcare provider education and training
  - Increased access to, and satisfaction with, cessation services
  - Smokefree treatment facilities
  - Stakeholder collaboration to increase efficiencies and strengthen services<sup>24</sup>
- The [PA Free Quitline](#) has implemented a pilot project designed to provide greater support for enrollees with behavioral health conditions. This effort includes a redesigned intake intended to screen for callers with behavioral health disorders, along with a specialized treatment protocol to be administered to enrollees who meet these criteria.<sup>25</sup>



## What Other States are Doing

- American Lung Association facilitated a nationwide Behavioral Health & Systems Change Cohort series in Spring 2021 involving 47 participants from 22 states including Tobacco Control Programs, Health Systems, providers, clinicians, Federally Qualified Health Center's (FQHC's), community partners and national network members. The purpose of this peer group was to increase knowledge, confidence and engagement among key stakeholders while focusing on the unique challenges in Behavioral health that are related to Organizational Culture Change, Billing & Documentation, Quality Improvement and Program Sustainability. Visit [Lung.org/cessationta](https://lung.org/cessationta) to access the resource library, recorded webcasts and podcasts, toolkits, connect with the Lung Association Tobacco Cessation Team or join the [Cessation TA Listserv](#).
- The University of Wisconsin-Madison Center for Tobacco Research and Intervention has created a number of training videos to address tobacco cessation in patients with behavioral health disorders, with specific talking points tailored to mental illnesses:
  - Schizophrenia video [one](#) and [two](#)
  - [Depression video](#)
- The [Kansas Tobacco Guideline for Behavioral Health Care](#) is an implementation toolkit that provides practical approaches and policy resources that behavioral health organizations can use to implement the Tobacco Guideline for Behavioral Health.
- Learning about Healthy Living is a wellness and psychoeducation curriculum developed and funded by the [New Jersey Division of Mental Health Services](#) to provide information to consumers with mental health disorders on how addressing tobacco use enhances healthy living.
- University of Medicine and Dentistry of New Jersey (UMDNJ) Robert Wood Johnson Medical School and UMDNJ's Tobacco Dependence program have collaborated to develop specialized services for people with mental illnesses who smoke. [The Tobacco Dependence Program \(TDP\)](#) is dedicated to reducing the harm to health caused by tobacco use.



## References and Resources

- [The Million Hearts Tobacco Cessation Change Package™ \(TCCP\)](#) is a quality improvement tool created by the CDC that is intended for health care professionals in outpatient, inpatient, and behavioral health settings and public health professionals who partner with these groups. The TCCP presents a list of process improvements that clinicians can implement as they seek to deliver optimal treatment to patients who use tobacco and gives clinical teams a practical resource to increase the reach and effectiveness of tobacco cessation interventions and to incorporate these interventions into the clinical workflow.
- [Quit Now: Freedom From Smoking® Online Discussion and Support Community](#) sponsored by the American Lung Association on Inspire.com are free support communities that offer a way for people to connect with others along their quit journey and receive peer-to-peer support every step along the way. A free app for Inspire is also available for mobile devices.
- The National Alliance on Mental Illness (NAMI) makes its [Hearts and Minds program](#) available, free of charge, through a video and workbook that focuses on diet, exercise, and smoking cessation.
- [Tips for Adult Smokers with Mental Illness](#) is a blog on the NAMI site adapted from the CDC. It originally appeared in the CDC's February 2013 issue of Vital Signs, "Adult Smoking: Focusing on People with Mental Illness." NAMI is a partner in the CDC's national tobacco education campaign Tips from Former Smokers.
- [Tobacco Free Toolkit for Healthcare Providers Supplement, Priority Population: Behavioral Health](#) is a behavioral health and Wellness Program developed by the University of Colorado Anschutz Medical Campus School of Medicine to help people with behavioral health concerns access and utilize tobacco cessation resources.
- [The National Behavioral Health Network for Tobacco & Cancer Control \(NBHN\)](#) is one of eight CDC national networks working to eliminate tobacco and cancer-related disparities. NBHN serves as a resource hub for health care professionals and seeks to combat disparities specifically impacting people with mental illnesses and addictions. The National Behavioral Health Network strengthens the capacity of health care professionals to develop and implement efforts focused on eliminating tobacco- and cancer-related disparities among people with mental illnesses and addictions.
- The Regional Pennsylvania Tobacco-Free Coalitions has a [Facts about Mental Health and Tobacco Use](#) resource in both [English](#) and [Spanish](#).

# Addiction/Alcoholism/ Illicit Drug Use Disorder/Substance Use Disorder

Individuals with mental illness may also have substance use disorders. The combination of these two illnesses has its own term: co-occurring disorders or dual diagnosis. Either disorder (substance use or mental illness) can develop first. According to the National Survey of Drug Use and Health, 9.2 million US adults experienced both mental illness and a substance use disorder in 2018.<sup>26</sup>

## Why it Matters

- Addictions afflict approximately 9% of Americans age 12 or older, and tobacco use is rampant in this population.<sup>27</sup>
- Individuals with alcohol use disorders smoke at rates between 34% and 80%; people with other substance use disorders smoke at rates between 49% and 98%.
  - Current cigarette smokers in the past month were more likely than those who were not nicotine dependent to have engaged in alcohol use (62% vs. 54%), binge alcohol use (43% vs. 22%), and heavy alcohol use (15% vs. 5%) in the past month.<sup>28</sup>
- More than 80% of youths with substance use disorders report current tobacco use. Most report daily smoking, and many become highly dependent, long-term users of tobacco.<sup>29</sup>
- Cigarette smoking increased the likelihood of relapse among people in recovery from substance use disorder. Helping patients quit and remain abstinent from smoking may improve their chances for sustained recovery from use of other drugs.<sup>30</sup>
- There is evidence that alcohol and tobacco misuse share some genetic etiology, notably in relation to reward pathways.<sup>31</sup>

## What We Know About What Works

- Studies show that participation in smoking cessation efforts while engaged in addiction treatment has been associated with a 25% greater likelihood of long-term abstinence. In addition, cessation in conjunction with other mental health or addictions treatment does not negatively affect abstinence from other substances.<sup>32</sup>
- Providing smoking treatment concurrently with treatment for other drugs improves smoking outcomes in the short-term and does not appear to harm drug treatment outcomes. Relapse to smoking is common among people who smoke but are attempting to quit, including adults with SUDs. Few studies have tested effective smoking treatments for adults with SUDs but there are promising preliminary results with pharmacotherapies for nicotine dependence.<sup>33</sup>

## What's Relevant in Pennsylvania

- Every day, 10 Pennsylvanians die from substance use disorder.<sup>34</sup>
- 18.5% of Pennsylvania adults reported engaging in binge drinking in 2015.<sup>35</sup>
- Among young adults aged 18–25 in Pennsylvania, during 2015–2017, the annual average prevalence of past-month binge alcohol use was 45.5% (or 609,000), higher than both the regional average (42.6%) and the national average (38.1%).<sup>36</sup>
- During 2014–2017, the annual average prevalence of past-year heroin use in Pennsylvania was 0.65% (or 70,000), similar to the regional average (0.63%) but higher than the national average (0.33%).<sup>37</sup>

## What Other States are Doing

- The University of Wisconsin–Madison Center for Tobacco Research and Intervention provides training videos illustrating clinical cessation encounters with specific talking points tailored to [Alcoholism](#).
- The Wisconsin Nicotine Treatment Integration Project (WiNTiP) works with providers offering mental health and substance abuse treatment services to integrate tobacco dependence into their efforts.
- [The Hawaii Department of Health Tobacco Prevention and Education Program \(TPEP\)](#) surveyed behavioral health programs to learn more about their current cessation practices. Some steps that TPEP took to address tobacco use among persons with behavioral health conditions and increase counseling in Hawaii include:
  - Partnering with the Hawaii Health Department's Adult Mental Health Division to provide a series of trainings on tobacco interventions to behavioral health clinical staff, case managers, and social workers.
  - Conducting a workshop for those same participants with a national expert on addressing tobacco use among persons with behavioral health conditions.
  - Working with the state Attorney General's Office to clarify that a state law allowing minors to consent to substance use disorder treatment without a parent's permission also applies to tobacco cessation treatment, resulting in the state Quitline and health providers being able to offer nicotine addiction counseling to more youth.
- During 2013–2017, the [Taking Texas Tobacco Free \(TTTF\) project](#), with funding from the Cancer Prevention and Research Institute of Texas, partnered with 22 community mental health treatment centers (representing over 250 individual clinics) to put comprehensive and sustainable tobacco-free programs in place in Texas. The goal was to reduce tobacco use and secondhand smoke exposure among employees, clients, and visitors by adopting tobacco-free campus policies, screening employees and clients regularly for tobacco use, and providing counseling and NRT to people who use tobacco and want to quit.



- Behavioral health facilities in [New York and Oklahoma](#) are national leaders in providing non-nicotine medications to help persons receiving treatment for mental or substance use disorders quit using tobacco. The proportion of Oklahoma mental health treatment facilities and the proportion of New York mental and substance use disorder treatment facilities providing non-nicotine medications to clients is nearly double the proportion of behavioral health treatment facilities doing so elsewhere in the U.S. Collectively these two states:
  - Gathered information from the state Bureau of Tobacco Control, the Office of Alcoholism and Substance Abuse Services, and the Office of Mental Health
  - Outlined what each behavioral health regulatory body requires and recommends for providing tobacco cessation medication
  - Drafted a Tobacco Dependence Treatment Financial Modeling Tool that, once finalized, will be piloted by Department of Health grantees assisting health care organizations. The Tool is intended to help the health care organizations better understand the costs and benefits of taking a range of steps to help people who smoke quit, including providing cessation medications on-site
  - Identified who was responsible for policy change
  - Gathered data about the costs of providing cessation medications, the number of people who would seek the medications, and the number of people who likely would quit using tobacco
  - Showed what the return on investment would be if cessation medications were covered by Medicaid at no cost to the client

## References and Resources

- The Addiction Technology Transfer Center Network has a [Work and Well-Being: Guide for Addiction Professionals](#) available, identifying common workplace stressors for addiction professionals and evidence-based, practical strategies and resources to promote healthy lifestyles and productive professional lives.
- The Substance Abuse and Mental Health Services Administration (SAMHSA) has created a [tobacco cessation toolkit](#) for substance use disorder (SUD) treatment programs. The toolkit is composed of three pieces:
  - **Implementing Tobacco Cessation Programs in Substance Use Disorder Treatment Settings: A Quick Guide for Program Directors and Clinicians**—this guide contains an overview of the harms of tobacco use and the benefits of tobacco cessation and a smoke-free workplace. It also includes tips for SUD treatment settings to begin implementing their own tobacco cessation programs.
  - **Quitting Tobacco – Help Your Clients to a Healthier Life** (for providers) - This pamphlet contains reasons to combine smoking cessation and SUD treatment, client testimonials, and resources for implementing a tobacco cessation program. It also explains the benefits of tobacco cessation programs to the provider program.
  - **You Can Quit Tobacco – Benefits and Tips for Quitting for Good** (for clients) - This pamphlet contains information on the health benefits that come with quitting tobacco, as well as the benefits to quitting tobacco while achieving recovery from SUD.
- University of Colorado Behavioral Health & Wellness program links to an infographic supporting smoking cessation therapy during treatment for substance use [Smoking Cessation Therapies Benefit Substance Use Disorder Clients](#) fact sheet.
- In addition, the University of Colorado Behavioral Health & Wellness program links to a [Tobacco Prevention and Cessation for Youth With Mental Illness and Substance Use Disorders](#) report focused on the tobacco cessation needs of youth with mental illnesses and substance abuse disorders, including adolescents (13-17 years old) and young adults (ages 18-25 years old). This report informs the development of effective tobacco control interventions for youth served by the public mental health and substance abuse systems.
- The Regional Pennsylvania Tobacco-Free Coalitions has a Substance Abuse and Tobacco Use resource in both [English](#) and [Spanish](#).

**Tags:**

Youth and Young Adults

# Opioid Use Disorder

According to the [Pennsylvania Department of Health website](#), the prescription opioid and heroin overdose epidemic is considered the worst public health crisis in Pennsylvania, affecting Pennsylvanians across the state, from big cities to rural communities.



## Why it Matters

- In those with an opioid use disorder (OUD), smoking prevalence is as high as 95%, and 83% in OUD patients being treated with methadone.
  - With overlapping physiologic pathways, nicotine addiction and opioid addiction appear to be mutually reinforcing.<sup>38</sup>

## What We Know About What Works

- Due to mixed findings regarding the efficacy of NRT for patients in opioid dependence treatment, unless contraindicated or unavailable, bupropion (which acts on dopaminergic neurons) or varenicline (which is a partial agonist of the alpha-4 beta-2 nicotinic acetylcholine receptor) will be better first-line options. This is particularly the case if providers can address general low adherence to taking medication capsules. Clinician training is necessary to ensure that cessation medications are prescribed in combination and at therapeutic dosages meeting individual dependence levels.<sup>39</sup>
- A 2015 study suggested that receiving tobacco dependence treatment from addiction treatment clinicians was strongly and positively associated with past year quit attempts.<sup>40</sup>
- Integrate smoking cessation into SUD treatment plans, including routinely screening for, and documenting, tobacco use.
  - Evidence-based treatments for people with tobacco dependence, including FDA-approved medication and counseling, can be utilized concurrently with treatment for other SUDs.
  - Additionally, connecting clients with evidence-based cessation resources to provide continuity of care and ongoing support can enhance intervention.
  - SUD treatment programs that implement tobacco dependence interventions, including NRT and individual and group therapy, have been found to achieve higher overall treatment completion rates.<sup>41</sup>

## What's Relevant in Pennsylvania

- In Pennsylvania, 65% of drug overdose deaths involved opioids in 2018—a total of 2,866 fatalities.<sup>42</sup>
- In a single-day count on March 31, 2017, 22,136 people in Pennsylvania were receiving methadone in opioid treatment programs as part of their substance use treatment—an increase from 20,606 people in 2013.<sup>43</sup>
- [The Pennsylvania Association of Community Health Centers \(PACHC\)](#) is working in collaboration with the Department of Health, Department of Human Services and Department of Drug & Alcohol Programs to combat the opioid crisis in response to the governor's opioid epidemic disaster declaration. For immediate assistance on finding treatment or determining how to pay for treatment, there is a 24/7 English and Spanish phone line to make referrals at 1-800-662-HELP (4357).



## What Other States are Doing

- [The University of Colorado, Behavioral Health & Wellness Program \(BHWP\)](#) is assisting the Washington Department of Health to meet the tobacco cessation needs of Washington citizens that use tobacco, with specific attention paid to individuals working through opioid addiction through the [Tobacco-Free Behavioral Health Initiative](#). BHWP will work with the state, counties, public service institutions, and other key stakeholders to articulate high-utility, realistic plans for meeting the demands of Washington residents who are the most at-risk users of tobacco. These activities will be critical to creating a tobacco cessation continuity-of-care that is both scalable and sustainable across geographic and other state diversity. Activities include learning communities and intense trainings, as well as providing direct technical assistance and consultation to CoP participating organizations. These efforts will assist in building a culture of learning and self-efficacy sustaining Washington's cessation programming.

## References and Resources

- [Tobacco And Opioids Factsheet](#): This factsheet presents the key themes and intersections around tobacco cessation and prevention and lung health and opioid misuse and abuse.
- [Brief: Tobacco and Opioids](#): This brief looks at the available literature and the connection between tobacco use and opioid abuse. This is a first step at looking at this research that currently exists.
- [National Behavioral Health Network for Tobacco & Cancer Control](#)
  - [An Implementation Toolkit For Statewide Tobacco Control Programs](#)
- The Tobacco Control Network has a 2018 presentation titled [Tobacco and Opioids Intersections of Two Ongoing Public Health Challenges](#) available on its website.

Prescription drugs are known to interact with other drugs, certain foods, smoking, and smoking cessation. In most cases it is the tobacco smoke, not the nicotine, that causes the interactions. Tobacco smoke influences absorption, distribution, metabolism or elimination of other drugs, potentially causing an altered response. People who smoke may require higher doses of medications. Upon cessation, dose reductions might be needed.<sup>44</sup>

\*The most clinically significant interactions are depicted in the shaded rows.

Drug/Class	Mechanism of Interaction and Effects
Pharmacokinetic Interactions	
Alprazolam (Xanax)	Conflicting data on significance, but possible ↓ plasma concentrations (up to 50%); ↓ half-life (35%).
Bendamustine (Treanda)	Metabolized by CYP1A2. Manufacturer recommends using with caution in smokers due to likely ↓ bendamustine concentrations, with ↑ concentrations of its two active metabolites.
Caffeine	Metabolism (induction of CYP1A2); ↑ clearance (56%). Caffeine levels likely ↑ after cessation.
Chlorpromazine (Thorazine)	<ul style="list-style-type: none"> <li>• ↓ Area under the curve (AUC) (36%) and serum concentrations (24%).</li> <li>• ↓ Sedation and hypotension possible in smokers; smokers may require ↑ dosages.</li> </ul>
Clopidogrel (Plavix)	<ul style="list-style-type: none"> <li>• ↑ Metabolism (induction of CYP1A2) of clopidogrel to its active metabolite.</li> <li>• Clopidogrel's effects are enhanced in people who smoke (&gt;10 cigarettes/day): significant ↑ platelet inhibition, ↓ platelet aggregation; improved clinical outcomes have been shown (smokers' paradox; may be dependent on CYP1A2 genotype); tobacco cessation should still be recommended in at-risk populations needing clopidogrel.</li> </ul>
Clozapine (Clozaril)	<ul style="list-style-type: none"> <li>• ↑ Metabolism (induction of CYP1A2); ↓ plasma concentrations (18%).</li> <li>• ↑ Levels upon cessation may occur; closely monitor drug levels and reduce dose as required to avoid toxicity.</li> </ul>
Erlotinib (Tarceva)	<ul style="list-style-type: none"> <li>• ↑ Clearance (24%); ↓ trough serum concentrations (2-fold).</li> </ul>
Flecainide (Tambocor)	<ul style="list-style-type: none"> <li>• ↑ Clearance (61%); ↓ trough serum concentrations (25%).</li> </ul> People who smoke may need ↑ dosages.
Fluvoxamine (Luvox)	<ul style="list-style-type: none"> <li>• ↑ Metabolism (induction of CYP1A2); ↑ clearance (24%); ↓ AUC (31%); ↓ plasma concentrations (32%).</li> <li>• Dosage modifications not routinely recommended but people who smoke may need ↑ dosages.</li> </ul>
Haloperidol (Haldol)	<ul style="list-style-type: none"> <li>• ↑ Clearance (44%); ↓ serum concentrations (70%).</li> </ul>
Heparin	<ul style="list-style-type: none"> <li>• Mechanism unknown but ↑ clearance and ↓ half-life are observed. Smoking has prothrombotic effects.</li> <li>• People who smoke may need ↑ dosages due to PK and PD interactions.</li> </ul>

**Key:**

↓ (decrease, falling, below) ↑ (increase, rising, above)

Drug/Class	Mechanism of Interaction and Effects
Pharmacokinetic Interactions, continued	
Insulin, subcutaneous	<ul style="list-style-type: none"> <li>Possible ↓ insulin absorption secondary to peripheral vasoconstriction; smoking may cause release of endogenous substances that cause insulin resistance.</li> <li>K &amp; PD interactions likely not clinically significant; people who smoke may need ↑ dosages.</li> </ul>
Irinotecan (Camptosar)	<ul style="list-style-type: none"> <li>↑ Clearance (18%); ↓ serum concentrations of active metabolite, SN-38 (~40%; via induction of glucuronidation); ↓ systemic exposure resulting in lower hematologic toxicity and may reduce efficacy.</li> <li>People who smoke may need ↑ dosages.</li> </ul>
Mexiletine (Mexitil)	<ul style="list-style-type: none"> <li>↑ Clearance (25%; via oxidation and glucuronidation); ↓ half-life (36%).</li> </ul>
Nintedanib (OFEV®)	<ul style="list-style-type: none"> <li>Decreased exposure (21%) in people who smoke.</li> <li>No dose adjustment recommended; however, patients should not smoke during use.</li> </ul>
Olanzapine (Zyprexa)	<ul style="list-style-type: none"> <li>↑ Metabolism (induction of CYP1A2); ↑ clearance (98%); ↓ serum concentrations (12%).</li> <li>Dosage modifications not routinely recommended but people who smoke may need ↑ dosages.</li> </ul>
Pirfenidone (Esbriet®)	<ul style="list-style-type: none"> <li>↑ Metabolism (induction of CYP1A2); ↓ AUC (46%) and ↓ Cmax (68%).</li> <li>Decreased exposure in smokers might alter efficacy profile.</li> </ul>
Propranolol (Inderal)	<ul style="list-style-type: none"> <li>↑ Clearance (77%; via side-chain oxidation and glucuronidation).</li> </ul>
Ropinirole (Requip)	<ul style="list-style-type: none"> <li>↓ Cmax (30%) and AUC (38%) in study with patients with restless legs syndrome.</li> <li>People who smoke may need ↑ dosages.</li> </ul>
Tacrine (Cognex)	<ul style="list-style-type: none"> <li>↑ Metabolism (induction of CYP1A2); ↓ half-life (50%); serum concentrations 3-fold lower.</li> <li>People who smoke may need ↑ dosages.</li> </ul>
Theophylline (Theo-Dur, etc.)	<ul style="list-style-type: none"> <li>↑ Metabolism (induction of CYP1A2); ↑ clearance (58–100%); ↓ half-life (63%).</li> <li>Levels should be monitored if smoking is initiated, discontinued, or changed. Maintenance doses are considerably higher in people who smoke.</li> <li>↑ Clearance with secondhand smoke exposure.</li> </ul>

**Key:**

↓ (decrease, falling, below) ↑ (increase, rising, above)

Drug/Class	Mechanism of Interaction and Effects
<b>Pharmacokinetic Interactions, continued</b>	
Tricyclic antidepressants (e.g., imipramine, nortriptyline)	<ul style="list-style-type: none"> <li>Possible interaction with tricyclic antidepressants in the direction of ↓ blood levels, but the clinical significance is not established.</li> </ul>
Tizanidine (Zanaflex)	<ul style="list-style-type: none"> <li>↓ AUC (30–40%) and ↓ half-life (10%) observed in males who smoke.</li> </ul>
Warfarin	<ul style="list-style-type: none"> <li>↑ Metabolism (induction of CYP1A2) of R-enantiomer; however, S-enantiomer is more potent and effect on INR is inconclusive. Consider monitoring INR upon smoking cessation.</li> </ul>
<b>Pharmacodynamic Interactions</b>	
Benzodiazepines (diazepam, chlordiazepoxide)	<ul style="list-style-type: none"> <li>↓ Sedation and drowsiness, possibly caused by nicotine stimulation of central nervous system.</li> </ul>
Beta-blockers	<ul style="list-style-type: none"> <li>Less effective antihypertensive and heart rate control effects; possibly caused by nicotine-mediated sympathetic activation.</li> <li>People who smoke may need ↑ dosages.</li> </ul>
Corticosteroids, inhaled	<ul style="list-style-type: none"> <li>People who smoke that have asthma may have less of a response to inhaled corticosteroids.</li> </ul>
Hormonal contraceptives	<ul style="list-style-type: none"> <li>↑ Risk of cardiovascular adverse effects (e.g., stroke, myocardial infarction, thromboembolism) in women who smoke and use oral contraceptives. Ortho Evra patch users shown to have 2-fold ↑ risk of venous thromboembolism compared to oral contraceptive users, likely due to ↑ estrogen exposure (60% higher levels).</li> <li>↑ Risk with age and with heavy smoking (&gt;15 cigarettes per day) and is quite marked in women &gt;35 years old.</li> </ul>
Opioids (propoxyphene, pentazocine)	<ul style="list-style-type: none"> <li>↓ Analgesic effect; smoking may ↑ the metabolism of propoxyphene (15–20%) and pentazocine (40%). Mechanism unknown.</li> <li>People who smoke may need ↑ opioid dosages for pain relief.</li> </ul>

**Key:**

↓ (decrease, falling, below) ↑ (increase, rising, above)



- 1 "NASMHPD Policy Statement on Tobacco Cessation in All Behavioral Health Settings." National Association of State Mental Health Program Directors. July 30, 2017. [https://nasmhpd.org/sites/default/files/Policy\\_Statement\\_Tobacco\\_Cessation.pdf](https://nasmhpd.org/sites/default/files/Policy_Statement_Tobacco_Cessation.pdf).
- 2 Centers for Disease Control and Prevention. National Center for Health Statistics. National Health Interview Survey, 2017. Analysis performed by the American Lung Association Epidemiology and Statistics Unit using SPSS software.
- 3 "Tobacco Use and Quitting Among Individuals with Behavioral Health Cond." Centers for Disease Control and Prevention, February 4, 2020. <https://www.cdc.gov/tobacco/disparities/mental-illness-substance-use/index.htm>.
- 4 Benjamin Lê Cook et al., "Trends in Smoking Among Adults with Mental Illness and Association Between Mental Health Treatment and Smoking Cessation," JAMA 311, no. 2 (January 8, 2014): 172–82. <https://doi.org/10.1001/jama.2013.284985>.
- 5 "Behavioral Health & Tobacco Use." American Lung Association. [lung.org/quit-smoking/smoking-facts/impact-of-tobacco-use/behavioral-health-tobacco-use](http://lung.org/quit-smoking/smoking-facts/impact-of-tobacco-use/behavioral-health-tobacco-use).
- 6 "Common Comorbidities with Substance Use Disorders Research Report." <https://d14rmgtrwzf5a.cloudfront.net/sites/default/files/f155-common-comorbidities-with-substance-use-disorders.pdf>.
- 7 Ibid.
- 8 "Integrating Tobacco Treatment Within Behavioral Health" Association for the Treatment of Tobacco Use and Dependence –ATTUD Disparate Populations Committee. <https://www.attud.org/pdf/ATTUD-position%20Talkingpoints.pdf>.
- 9 Sweetland J. Framing Tobacco as a Social Justice Issue. Presented to the California Tobacco Control Program, January 10, 2020.
- 10 "CDC Vital Signs: Adult Smoking: Focusing on People with Mental Illness."
- 11 Ibid.
- 12 Ibid.
- 13 Lindsay Banham et al., "Smoking Cessation in Severe Mental Illness: What Works?" Addiction (Abingdon, England) 105, no. 7 (July 2010): 1176–89. <https://doi.org/10.1111/j.1360-0443.2010.02946.x>.
- 14 Kelly M. Carpenter et al., "Feasibility and Early Outcomes of a Tailored Quitline Protocol for Smokers with Mental Health Conditions," Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco 21, no. 5 (17 2019): 584–91. <https://doi.org/10.1093/ntr/ntz023>.
- 15 Paul Krebs et al., "Relationship between Tobacco Cessation and Mental Health Outcomes in a Tobacco Cessation Trial," Journal of Health Psychology 23, no. 8 (2018): 1119–28. <https://doi.org/10.1177/1359105316644974>.
- 16 Mary F. Brunette et al., "Brief, Web-Based Interventions to Motivate Smokers with Schizophrenia: Randomized Controlled Trial," JMIR Mental Health 7, no. 2 (2020): e16524. <https://doi.org/10.2196/16524>.



- 17 M. D. Molly S. Brett, "Pharmacologic Treatment for Tobacco Dependence," NEJM Journal Watch 2020 (July 21, 2020). <https://doi.org/10.1056/nejm-jw.NA52083>.
- 18 Tobacco Use and Quitting Among Individuals with Behavioral Health Conditions. February 4, 2020. <https://www.cdc.gov/tobacco/disparities/mental-illness-substance-use/index.htm>
- 19 Alana M. Rojewski et al., "Exploring Issues of Comorbid Conditions in People Who Smoke," Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco 18, no. 8 (2016): 1684–96. <https://doi.org/10.1093/ntr/ntw016>.
- 20 "Quit Don't Switch Training" American Lung Association. <https://quiddontswitchtraining.lung.org>.
- 21 Substance Abuse and Mental Health Services Administration. Behavioral Health Barometer: Pennsylvania, Volume 5: Indicators as measured through the 2017 National Survey on Drug Use and Health and the National Survey of Substance Abuse Treatment Services. HHS Publication No. SMA-19-Baro-17-PA. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2019.
- 22 AC Ernst et al., "Addressing Tobacco Use Within Behavioral Health Settings." Pennsylvania Department of Health.
- 23 Ibid.
- 24 Ibid.
- 25 Ibid.
- 26 "Substance Use Disorders | NAMI: National Alliance on Mental Illness." <https://nami.org/about-mental-illness/common-with-mental-illness/substance-use-disorders>.
- 27 "Behavioral Health," UCSF Smoking Cessation Leadership Center, September 6, 2013. <https://smokingcessationleadership.ucsf.edu/behavioral-health>.
- 28 Ibid.
- 29 "Behavioral Health & Tobacco Use."
- 30 National Institute on Drug Abuse, "Cigarette Smoking Increases the Likelihood of Drug Use Relapse," National Institute on Drug Abuse, May 31, 2018. <https://www.drugabuse.gov/news-events/nida-notes/2018/05/cigarette-smoking-increases-likelihood-drug-use-relapse>.
- 31 Catherine King et al., "Mendelian Randomization Case-Control PheWAS in UK Biobank Shows Evidence of Causality for Smoking Intensity in 28 Distinct Clinical Conditions," EClinicalMedicine, July 31, 2020, 100488, <https://doi.org/10.1016/j.eclinm.2020.100488>.
- 32 "Behavioral Health," UCSF Smoking Cessation Leadership Center, September 6, 2013. <https://smokingcessationleadership.ucsf.edu/behavioral-health>.
- 33 Andrea H. Weinberger et al., "Cigarette Smoking Is Associated with Increased Risk of Substance Use Disorder Relapse: A Nationally Representative, Prospective Longitudinal Investigation," The Journal of Clinical Psychiatry 78, no. 2 (February 2017): e152–60. <https://doi.org/10.4088/JCP.15m10062>.
- 34 "Treating Heroin and Opioid Use Disorder," Pennsylvania Department of Health. <https://www.pa.gov/guides/opioid-epidemic/>
- 35 "Alcohol and Public Health Data on Excessive Drinking," Centers for Disease Control and Prevention. <https://www.cdc.gov/alcohol/data-stats.htm>
- 36 Substance Abuse and Mental Health Services Administration. Behavioral Health Barometer: Pennsylvania, Volume 5: Indicators as measured through the 2017 National Survey on Drug Use and Health and the National Survey of Substance Abuse Treatment Services. HHS Publication No. SMA-19-Baro-17-PA. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2019.
- 37 Ibid.
- 38 "Brief: Tobacco and Opioids," American Lung Association. <https://www.lung.org/getmedia/56298566-a9cf-455f-a008-f3ed2a6d1f2f/brief-on-tobacco-and-opioids.pdf.pdf>.
- 39 Chad D. Morris and Christine E. Garver-Apgar, "Nicotine and Opioids: A Call for Co-Treatment as the Standard of Care," The Journal of Behavioral Health Services & Research, June 3, 2020, 1–13. <https://doi.org/10.1007/s11414-020-09712-6>.
- 40 "Brief: Tobacco and Opioids."
- 41 Ibid.
- 42 "Pennsylvania: Opioid-Involved Deaths and Related Harms," National Institute on Drug Abuse. April 3, 2020. <https://www.drugabuse.gov/drug-topics/opioids/opioid-summaries-by-state/pennsylvania-opioid-involved-deaths-related-harms>
- 43 Substance Abuse and Mental Health Services Administration. Behavioral Health Barometer: Pennsylvania, Volume 5: Indicators as measured through the 2017 National Survey on Drug Use and Health and the National Survey of Substance Abuse Treatment Services. HHS Publication No. SMA-19-Baro-17-PA. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2019.
- 44 "Drug Interactions with Tobacco Smoke." American Academy of Family Physicians. [https://www.aafp.org/dam/AAFP/documents/patient\\_care/tobacco/drug-interactions.pdf](https://www.aafp.org/dam/AAFP/documents/patient_care/tobacco/drug-interactions.pdf). (Adapted from Zevin S, Benowitz NL. Drug interactions with tobacco smoking. Clin Pharmacokinet. 1999;36:425–438.)