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# The World Trade Center Health Program: Smoking Cessation

**Gerald Lilly**[1], **Geoffrey M. Calvert**[1]

[1]World Trade Center Health Program, National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC), Cincinnati, OH, 45226, USA

## Abstract

Cigarette smoking can cause and/or worsen a variety of health conditions. The U.S. Preventive Services Task Force (USPSTF) recommends that smoking cessation services be offered to all adults who currently smoke, and governmental and non-governmental professional organizations support providing these interventions to patients who smoke. The World Trade Center (WTC) Health Program, a federal program that provides health monitoring and treatment to those directed exposed to the September 11, 2001 terrorist attacks, provides smoking cessation therapy for eligible members. This paper identifies treatment strategies for smoking cessation and references the treatment coverage policy in the WTC Health Program. In addition, this paper notes the higher smoking prevalence among those with mental health conditions such as posttraumatic stress disorder (PTSD), and the need for heightened cessation efforts given the lower quit success rates among such persons.

## Introduction

This paper is one in a series of papers to promote the practice of high quality, evidence-based medicine when evaluating, diagnosing and treating persons who were directly exposed to the September 11, 2001 terrorist attacks and their aftermath (see Calvert et al 2023 for more background details). This paper focuses on the importance of smoking cessation and strategies to promote abstinence. It also briefly describes coverage of tobacco dependence treatment among eligible World Trade Center (WTC) Health Program members.

Cigarette smoking is the leading cause of preventable disease, disability, and death in the United States with a smoking prevalence of 12.5% in 2020; however, smoking is not equally prevalent across the population with higher smoking rates found among specific subgroups (e.g., persons with low socioeconomic status, persons with mental illness, and persons belonging to racial/ethnic minority groups) (Cornelius et al 2022; USDHHS 2014). Cigarette smoking causes at least 12 types of cancer, including acute myeloid leukemia

jac6@cdc.gov .

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(AML) and cancers of the oral cavity and pharynx; esophagus; stomach; colon and rectum; liver; pancreas; larynx; lung, bronchus, and trachea; kidney and renal pelvis; urinary bladder; and cervix (USDHHS 2014). Approximately 80-90% of lung cancer deaths are attributable to cigarette smoking, and smoking increases the risk for both physical and mental health problems (USDHHS 2014). Furthermore, smoking exacerbates many WTC Health Program-covered conditions, including all covered aerodigestive disorders (USDHHS 2014; Maret-Ouda et al 2020). Smoking impacts nearly every organ system of the body and has been causally linked to multiple chronic diseases including COPD, cardiovascular disease including heart disease and stroke, and type 2 diabetes (USDHHS 2014).

Given the hazards of smoking, it is important to promote smoking cessation among patients who smoke. Even for patients with smoking-related disease, it is often not too late to experience the benefits of quitting (USDHHS 2020). The USPSTF recommends that smoking cessation services be offered to all currently smoking adults (USPSTF 2021). Smoking cessation medications and behavioral counseling increase the likelihood of successfully quitting smoking, particularly when used in combination (Fiore et al 2008). Systematic reviews found that participants who received a combination of pharmacotherapy and behavioral counseling had higher cessation rates at 6 months compared with control participants who received only pharmacotherapy and, in some cases, brief advice on quitting (Hartmann-Boyce et al 2019). There are 7 FDA-approved smoking cessation medications, 3 of which are available over-the-counter (USDHHS 2020). Behavioral counseling can be delivered in a variety of formats, including individual, group, and telephone, all of which have been demonstrated to be effective (USDHHS 2020). Additionally, research shows that web-based and mobile phone text messaging interventions can effectively help adults quit smoking (USDHHS 2020; The Community Guide 2020).

Smoking prevalence in the WTC Health Program has declined substantially since 2001 (Weber et al 2020) and is currently lower than national estimates. However, an analysis of tobacco dependence treatment utilization using Program claims data from July 2011 through July 2018 suggests that among currently smoking members, there may be underutilization of the smoking cessation services that can maximize quit success, including optimal usage of pharmacotherapy and behavioral counseling. This underutilization reflects national patterns (Babb et al 2017).

## Smoking cessation among those with mental health conditions

Smoking rates are higher in people with mental health conditions (Cook et al 2014). Smoking cessation success rates are also lower in those with mental illness, and WTC Health Program members appear to be at increased risk for mental health conditions such as PTSD (Cook et al 2014; Welch et al 2015; Jordan et al 2019). A study of smoking WTC police responders found that the severity of reported PTSD symptoms at the initial visit was inversely correlated with the likelihood of smoking abstinence at the follow-up visit approximately 2.6 years later (Zvolensky et al 2015). This comorbidity between smoking behavior and mental illness may be due, in part, to a heightened perceived threat of experiencing undesired somatic symptoms and other harmful consequences from smoking abstinence (e.g., stress of coping with nicotine abstinence) as well as a tendency to manage

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distress by smoking (Farris et al 2015; Gonzalez et al 2015). As such, tailored treatments may be needed to address smoking cessation in patients with mental health conditions.

## Treatment strategies:

There are at least three helpful recommendation statements or clinical practice guidelines (CPG) for smoking cessation:

- *Treating Tobacco Use and Dependence: 2008 Update*, May 2008 – although published over 14 years ago, this is considered the most up-to-date US Public Health Service CPG on smoking cessation. This CPG is still considered the general standard and is substantially more comprehensive than either the USPSTF or the ATS (VanFrank 2022). The CPG outlines a broad range of effective tobacco dependence counseling and FDA-approved medication treatments. The CPG can be found at this link: https://www.ncbi.nlm.nih.gov/books/NBK63952/
- *The U.S. Preventive Services Task Force (USPSTF)*, January 2021 – this recommendation statement concludes with high certainty that the net benefit of behavioral interventions and FDA–approved pharmacotherapy interventions for tobacco smoking cessation, alone or combined, in nonpregnant adults who smoke is substantial. Effective behavioral interventions include physician advice, nurse advice, individual counseling, group behavioral interventions, telephone counseling, and mobile phone text messaging interventions. In addition, this recommendation concludes with high certainty that the net benefit of behavioral interventions for tobacco smoking cessation on perinatal outcomes and smoking cessation in pregnant persons is substantial. This recommendation statement is available at this link: https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/tobacco-use-in-adults-and-pregnant-women-counseling-and-interventions.
- *American Thoracic Society (ATS)*, May 2020 – this CPG mainly discusses FDA-approved pharmacotherapy interventions for tobacco-dependent adults and recommends initiating varenicline treatment even in smokers not yet ready to abstain. As for those with comorbid psychiatric conditions such as depression and anxiety, this CPG explains that these persons may have “more severe nicotine dependence than the general population and may require more flexibility in the approach, including higher doses, longer-duration counseling, and/or more aggressive combinations of pharmacotherapy.” This CPG is available at this link: https://www.atsjournals.org/doi/pdf/10.1164/rccm.202005-1982ST.

There is overwhelming evidence of the positive health benefits from smoking cessation which are not negated by any negative potential effects such as weight gain, somatic symptoms, and stress of coping with nicotine abstinence (Aldrich et al 2016; Farris et al 2015; Gonzalez et al 2015).

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### Program Coverage:

Details on Program coverage for smoking cessation are available at: https://www.cdc.gov/wtc/ppm.html#medical_smoking. The WTC Health Program provides smoking cessation therapy for most members who smoke, including smoking cessation medications and behavioral counseling. Telephone tobacco cessation counseling is available to the general public at no cost and in multiple languages (e.g., NYS Smokers' Quitline [1-866-NY-QUITS], and the national 1-800-QUIT-NOW). Nation-wide text-based services can be accessed through the national texting portal (text QUITNOW or DÉJELO YA to 333888; message and data rates may apply). A texting program specific for residents of New York State can be accessed at: https://www.nysmokefree.com/ToolsAndResources/TextMessaging. Web-based services can be found at www.smokefree.gov and www.cdc.gov/quit. In addition, the NYC Health Department promotes smoking cessation assistance to NYS residents by offering a free starter kit of nicotine medications after talking to a Quitline coach. Details of this program can be accessed at: https://www.nyc.gov/site/doh/health/health-topics/smoking-nyc-quits.page

## Conclusion:

The WTC Health Program provides smoking cessation counseling and FDA-approved pharmacological treatments for eligible members. Combination therapy (i.e., medications and behavioral counseling) has been proven to be more effective than either medication or counseling alone. Tobacco dependence is a chronic relapsing and remitting disease that requires on-going, longitudinal management beyond initial diagnosis and acute phase treatment. It is a chronic illness that often requires repeated intervention and multiple attempts to quit to achieve full recovery. Members with comorbid psychiatric conditions (e.g., PTSD or depression) and other mental health conditions may have more severe nicotine dependence and may require more aggressive tobacco dependence treatment. Finally, more work is needed to identify consistently effective treatments for current smokers with comorbid psychiatric conditions.

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## References:

Aldrich TK, Vossbrinck M, Zeig-Owens R, Hall CB, Schwartz TM, Moir W, Webber MP, Cohen HW, Nolan A, Weiden MD, Christodoulou V, Kelly KJ, Prezant DJ [2016]. Lung Function Trajectories in World Trade Center-Exposed New York City Firefighters Over 13 Years: The Roles of Smoking and Smoking Cessation. Chest 149(6):1419–1427. 10.1016/j.chest.2015.10.067 [PubMed: 26836912]

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Babb S, Malarcher A, Schauer G, Asman K, Jamal A [2017]. Quitting smoking among adults—United States, 2000–2015. Morbidity and Mortality Weekly Report 65(52):1457–6. [PubMed: 28056007]

Calvert GM, Anderson K, Cochran J, Cone JE, Harrison DJ, Haugen PT, Lilly G, Lowe SM, Luft BJ, Moline JM, Reibman J, Rosen R, Udasin IG, Werth AS. The World Trade Center Health Program: an introduction to best practices. Arch Environ Occup Health. 2023;78(4):199–205. [PubMed: 36533439]

Cook BL, Wayne GF, Kafali EN, Liu Z, Shu C, Flores M [2014]. Trends in Smoking Among Adults With Mental Illness and Association Between Mental Health Treatment and Smoking Cessation. JAMA 311(2):172–182. 10.1001/jama.2013.284985 [PubMed: 24399556]

Cornelius ME, Loretan CG, Wang TW, Jamal A, Homa DM [2022]. Tobacco Product Use Among Adults - United States, 2020. MMWR Morb Mortal Wkly Rep. 71(11):397–405. [PubMed: 35298455]

Farris SG, Paulus DJ, Gonzalez A, et al. [2015]. Anxiety sensitivity mediates the association between post-traumatic stress symptom severity and interoceptive threat-related smoking abstinence expectancies among World Trade Center disaster-exposed smokers. Addict Behav. 51:204–210. DOI: 10.1016/j.addbeh.2015.07.031 [PubMed: 26298644]

Fiore MC, Jaén CR, Baker TB, et al. [2008]. Treating Tobacco Use and Dependence: 2008 Update. Clinical Practice Guideline. Rockville, MD: U.S. Department of Health and Human Services. Public Health Service. May 2008.

Gonzalez A, Friedberg F, Li X, et al. [2017]. Trauma-Focused Smoking Cessation for Smokers Exposed to the World Trade Center Disaster: A Randomized Clinical Trial. Nicotine Tob Res. 19(8):968–975. 10.1093/ntr/ntw384 [PubMed: 28013272]

Hartmann-Boyce J, Hong B, Livingstone-Banks J, Wheat H, Fanshawe TR [2019]. Additional behavioural support as an adjunct to pharmacotherapy for smoking cessation. Cochrane Database Syst Rev. 6(6):CD009670. DOI: 10.1002/14651858.CD009670.pub4 [PubMed: 31166007]

Jordan HT, Osahan S, Li J, et al. [2019]. Persistent mental and physical health impact of exposure to the September 11, 2001 World Trade Center terrorist attacks. Environ Health 18, 12. 10.1186/s12940-019-0449-7 [PubMed: 30755198]

Maret-Ouda J, Markar SR, Lagergren J [2020]. Gastroesophageal Reflux Disease: A Review. JAMA. 324(24):2536–2547. [PubMed: 33351048]

The Community Guide. Tobacco Use: Mobile Phone Text Messaging Interventions for Smoking Cessation. Community Preventive Services Task Force Finding and Rationale Statement, July 2020. Accessed December 7, 2022. https://www.thecommunityguide.org/media/pdf/Tobacco-Mobile-Phone-Text-Messaging-Interventions-508.pdf

USDHHS [2014]. The health consequences of smoking—50 years of progress: a report of the Surgeon General. Atlanta, GA: US Department of Health and Human Services, CDC; 2014. Accessed September 22, 2021. https://www.ncbi.nlm.nih.gov/books/NBK179276/pdf/Bookshelf_NBK179276.pdf

USDHHS [2020]. Smoking Cessation. A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2020. Accessed December 30, 2021. https://www.hhs.gov/sites/default/files/2020-cessation-sgr-full-report.pdf

U.S. Preventive Services Task Force [2021]. Interventions for Tobacco Smoking Cessation in Adults, Including Pregnant Persons: US Preventive Services Task Force Recommendation Statement. JAMA. 325(3):265–279. DOI: 10.1001/jama.2020.25019 [PubMed: 33464343]

VanFrank B [2022], Email message from B. VanFrank, Office on Smoking and Health, to G. Calvert, World Trade Center Health Program, National Institute for Occupational Safety and Health, Centers for Disease Control, U.S. Department of Health and Human Services, March 14.

Weber J, Reeves AP, Doucette JT, Jeon Y, Sood A, San José Estépar R, Celedón JC, de la Hoz RE [2020]. Quantitative CT Evidence of Airway Inflammation in WTC Workers and Volunteers with Low FVC Spirometric Pattern. Lung 198(3):555–563. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7245558 [PubMed: 32239319]

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Welch AE, Jasek JP, Caramanica K, Chiles MC, Johns M [2015]. Cigarette smoking and 9/11-related posttraumatic stress disorder among World Trade Center Health Registry enrollees, 2003–12. Preventive Medicine 73:94–99. 10.1016/j.ypmed.2015.01.023 [PubMed: 25655710]

Zvolensky MJ, Farris SG, Kotov R, et al. [2015]. Posttraumatic stress symptoms and smoking among World Trade Center disaster responders: A longitudinal investigation. Compr Psychiatry 63:46–54. DOI: 10.1016/j.comppsych.2015.08.006 [PubMed: 26555491]