Alan L. Peterson · Mark W. Vander Weg ·
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Nicotine and Tobacco Dependence

Advances in Psychotherapy
Evidence-Based Practice

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Advances in Psychotherapy – Evidence-Based Practice

The basic objective of this series is to provide therapists with practical, evidence-based treatment guidance for the most common disorders seen in clinical practice – and to do so in a "reader-friendly" manner. Each book in the series is both a compact "how-to-do" reference on a particular disorder for use by professional clinicians in their daily work, as well as an ideal educational resource for students and for practice-oriented continuing education.

The most important feature of the books is that they are practical and "reader-friendly:" All are structured similarly and all provide a compact and easy-to-follow guide to all aspects that are relevant in real-life practice. Tables, boxed clinical "pearls", marginal notes, and summary boxes assist orientation, while checklists provide tools for use in daily practice.

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Preface

In the 20th century, tobacco use killed an estimated 100 million people worldwide, making tobacco use the leading preventable cause of death in the world (World Health Organization [WHO], 2008). Tobacco is the only legally available consumer product which kills people when it is used entirely as intended (Walton, Barondess, & Lock, 1994). That is why it has practically become a mantra in the health care field that the single most important thing a person can do to improve his or her health is to quit tobacco. Similarly, most health care clinicians can improve physical and psychological health and save more lives by helping their patients quit tobacco than by any other intervention.

But what is the best way to achieve this often elusive goal? The development of effective behavioral and pharmacological treatments for nicotine and tobacco dependence has created a need for a clinician-friendly book to describe how to use these treatment approaches with their patients. This book attempts to fill that need as it describes the conceptualization, assessment, and treatment of nicotine and tobacco dependence using evidence-based behavioral and pharmacological treatment approaches. Tobacco use is a behavior, and so this book builds upon the principles of behavior change and how the efficacy of medication treatments can be enhanced when combined with behavioral approaches.

No individual health care specialty has captured the market on tobacco cessation. The primary target audience for this book series is psychologists, and they may very well have the highest level of skills to specifically target behavior change. Therefore, psychologists have an opportunity to capture a major portion of health care related to tobacco cessation. However, because tobacco use is present in virtually every patient population, we wrote this book also to target clinicians from a variety of other health care disciplines, including primary and specialty care physicians, dentists, nurse practitioners, physician assistants, social workers, and other mental health counselors. The primary target population for tobacco cessation outlined in this book is adult patients seen in outpatient settings. We have chosen to use the term *patients* rather than *clients* throughout the book because this term can be used interchangeably in both mental health and medical settings.

There are at least two primary ways to use this book. First, it can be used as a guide for providing intensive tobacco cessation treatment for patients who are specifically interested in quitting tobacco. Second, it can be used as a way to provide brief interventions with *all* tobacco users seen in a clinical practice setting – including those who are not seeking out treatment for tobacco cessation. This may even include some patients who upon initial assessment do not appear to be even the least bit interested in quitting. However, as we will review in the book, the majority of individuals currently using tobacco are interested in quitting at some point in the near future, and a skilled psychologist or other health care provider can prompt a quit attempt in the majority of these individuals.

About eight or nine out of every 10 people who quit tobacco do so on their own without any formal intervention by a clinician (Fiore et al., 1990; Zhu, Melcer, Sun, Rosbrook, & Pierce, 2000). From this perspective, quitting tobacco might appear to be relatively easy once an individual decides to quit. Conversely, the majority of individuals who use tobacco are interested in quitting in the near future, yet only about 5% are successful each year (Centers for Disease Control and Prevention [CDC], 2002; Hughes, Keely, & Naud, 2004). Even when best-practice approaches are used by the most experienced clinicians, the success rates for tobacco cessation remain rather modest. Long-term abstinence rates rarely exceed 30% in randomized clinical trials. Therefore, we recommend that clinicians approach nicotine and tobacco dependence as they would other chronic mental health or medical conditions. Many patients will require repeated quit attempts over a period of months or years before they are ultimately successful in quitting permanently. Nonetheless, most patients can eventually quit with continued support and encouragement from their health care providers. For some patients, quitting tobacco may be the most difficult thing they ever do. To be successful they may need to fight as if their life depends on it, because it does.

The book is divided into five chapters. The first chapter provides an overall description of nicotine and tobacco dependence, including definitions for common terminology, diagnostic criteria, epidemiology, common comorbidities, and self-report measures of nicotine use and dependence. Although the book emphasizes cigarette smoking cessation, it also applies to other forms of tobacco use, such as smokeless tobacco (dip and chew), cigars, and pipes. Chapter 2 provides a brief review of the most common theories and models of nicotine and tobacco dependence with an emphasis on those with the greatest applicability to the practicing clinician. In Chapter 3, we describe the diagnostic and assessment strategies to help determine the most appropriate treatment approach. Chapter 4 provides details on evidence-based approaches for tobacco cessation, including both brief and intensive treatments. Brief treatments can be integrated into primary or specialty care settings where quitting tobacco is not the primary focus of treatment. The intensive treatment program we outline is designed to be delivered as an eight-session program suitable for psychologists or other mental health practitioners working in an outpatient mental health setting. The *Treating Tobacco Use and Dependence: 2008 Update* by the US Department of Health and Human Services (Fiore, Jaén, Baker, et al., 2008) provides the most comprehensive and up-to-date review of the treatment-outcome literature, assessing the findings of over 8,700 research articles. We reference this guideline frequently throughout the book and provide a concise summary of the findings and principles that are most useful for practicing clinicians. Finally, Chapter 5 includes a series of clinical case vignettes to demonstrate clinician–patient interactions targeting tobacco cessation. A variety of forms and patient handouts for use in assessment and treatment appear throughout the chapters and in the book's appendices. In addition, a website is available at http://www.nicotineandtobaccodependence.com for the free download and printing of many of the documents included in the appendices, as well as additional forms and handouts that are useful for clinicians and patients. We hope this book is a valuable guide for clinicians and other health care providers to help them assist their patients to successfully quit tobacco and to stay quit permanently.

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Dedication

I dedicate this book to my wife, Sandy, and our two sons, Dane and Stefan. They have inspired me and taught me some of the most important lessons in life. I also dedicate this book to my parents, Charles and Jean Peterson, both of whom died from smoking-related lung cancer and provided inspiration to me to pursue clinical and research work in tobacco cessation.

ALP

I dedicate this book to Denise, Mary, and Caroline for their endless support and inspiration.

MWVW

I dedicate this book to my wife, Diane, and our children (Jaime, Ricardo, Marialicia, Alexander, Luis Carlos, Juan Pablo, and Daniel), whose unconditional support and love have sustained me professionally and personally. I also dedicate this book to my father, Roberto, whose life's testimony and early death inspired me to improve prevention and promote health for all.

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Description of Nicotine and Tobacco Dependence

1.1 Terminology

Although the primary emphasis of this book is on cigarette smoking cessation, it is also meant to apply to all forms of tobacco. Therefore, we often use the term *tobacco use* throughout the book to refer to all forms of tobacco, including cigarettes, chewing tobacco, cigars, bidis, snus, pipe tobacco, and clove cigarettes. As a starting point, it will be useful to clarify some of the terminology we will be using throughout this book. Although there are many different terms used to describe substance use disorders and the experience of dependence, we will use those developed by the American Psychiatric Association (APA) and the World Health Organization (WHO), as well as those commonly utilized in the field of tobacco control.

1.1.1 DSM-IV-TR

The American Psychiatric Association (APA) *Diagnostic and Statistical Manual of Mental Disorders,* 4th Edition, Text Revision (DSM-IV-TR; APA, 2000), is the generally accepted taxonomy of psychiatric and psychological disorders used by medical and mental health professionals in the United States. Based on the assumption that dependence on various substances shares several common characteristics, the basic diagnostic criteria for substance dependence are consistent across several different classes of licit and illicit drugs. According to the DSM-IV-TR (see Appendix 1), substance dependence (including nicotine dependence) is characterized by a maladaptive pattern of substance use involving cognitive, behavioral, and physiological symptoms and resulting in continued use of the substance despite significant substance-related problems (APA, 2000).

1.1.2 ICD-10

The other most commonly adopted criteria for diagnosing substance dependence come from the World Health Organization (WHO) *International Classification of Diseases,* 10th Revision (ICD-10; WHO, 1992). Outside of the United States, ICD-10 is the most commonly used classification system for psychiatric conditions, including substance use disorders. In an effort to promote consistency and make it easier to facilitate knowledge transfer and

comparisons across different countries, the ICD-10 and DSM-IV-TR criteria were designed to be highly similar, with a few exceptions.

1.2 Definitions

1.2.1 Dependence, Addiction, and Abuse

Nicotine dependence includes tolerance, withdrawal, and the inability to control use.

The term *nicotine dependence* refers to problematic tobacco use characterized by tolerance, withdrawal, and the inability to control use. When we say that someone is nicotine dependent, we place the focus on the substance (nicotine) primarily responsible for the physiological and behavioral dependence associated with tobacco use, and we emphasize the fact that nicotine dependence represents much more than a habit or insufficient willpower. Although other behavioral, psychological, and sensory cues associated with cigarette smoking influence the dependence that accompanies regular tobacco use (Rose, 2006), nicotine is the chemical most strongly implicated in this process. In addition, although the terms *dependence* and *addiction* are frequently used interchangeably, the lack of a standard definition for the latter contributes to some confusion regarding its meaning. Therefore, we will use the term *nicotine dependence* throughout the book. Finally, it is important to distinguish substance dependence from substance use and abuse. Substance *use* refers to any ingestion of a substance, in this case tobacco, regardless of the amount or the effects, whereas substance *abuse* refers to a maladaptive pattern of substance use that causes clinically significant impairment or distress, such as failure to fulfill role obligations, use in hazardous situations, or recurrent social or legal problems related to use. How these terms relate specifically to nicotine and tobacco is described throughout the chapter. However, it should be noted that tobacco use differs from many other commonly used substances, such as alcohol and caffeine, in that there is no known safe level of tobacco use.

There is no safe level of tobacco use.

1.2.2 Tolerance, Withdrawal, and Compulsive Use

The defining features of substance dependence include increasing tolerance to the substance, withdrawal, and compulsive use. In general, *tolerance* to a substance refers to the need to use increasing amounts of the substance over time to achieve the same or desired effect. For example, when people first start smoking, it is common for them to smoke occasionally, typically in context-specific situations, such as when they are socializing with peers. Then over time, they begin to smoke daily, and then to smoke throughout the day. At this point, they generally settle into an established smoking pattern, and over the long term, their daily consumption rate remains fairly consistent – a pattern unlike that seen with many other substances of abuse. The ultimate frequency of tobacco use can vary considerably from person to person, with some people meeting criteria for nicotine dependence who smoke just a few cigarettes per day, whereas others may smoke as many as four or more packs (more than 80

cigarettes) per day (Lawrence, Fagan, Backinger, Gibson, & Hartman, 2007). *Withdrawal* refers to a reversible, substance-specific syndrome involving aversive behavioral, cognitive, and physiological changes brought about by the cessation or reduction of substance use that has been heavy or prolonged (APA, 2000). Finally, *compulsive use* refers to difficulty controlling the consumption of a substance. For example, individuals who are dependent on a substance might use it in greater amounts or for a longer period of time than they intended; they may experience a persistent desire for the substance; or they may be unable to reduce or discontinue its use.

1.3 Epidemiology

The US Centers for Disease Control and Prevention (CDC) conducts regular surveys of the health status and behaviors of US adults (CDC, 2008). A 2007 survey showed that about one in five people in the United States (19.8%; 43.4 million) aged 18 or older currently smokes cigarettes. This rate is substantially reduced from the mid-1960s, when more than 40% of all US adults smoked. Most current cigarette smokers (78%) are daily smokers. In addition, more men (22%) than women (17%) smoke cigarettes. Rates of cigarette smoking are highest among American Indians and Alaska Natives (36%), followed by non-Hispanic Whites (21%) and non-Hispanic Blacks (20%). Rates of smoking are lowest among Asian (10%) and Hispanic (13%) adults. There is a strong inverse association between both education and income level and smoking rates. Adults with less than a high school education or a General Educational Development (GED) diploma are much more likely to smoke (44%) than those with a college degree (11%). Similarly, those who are living below the federal poverty level are much more likely to smoke cigarettes (29%) than those above the poverty level (20%). Young and middle-aged adults are the most likely to smoke cigarettes (22–23%) compared with adults 65 and older (8%). These age differences likely reflect several factors (e.g., increased opportunities to quit with age; smokers are more likely to die at an earlier age than nonsmokers).

1.4 Course and Prognosis

Most tobacco use starts in childhood or adolescence.

The vast majority of tobacco use has its origins in childhood or adolescence, and the average age at which people first start smoking has been relatively stable since the mid-1990s (National Cancer Institute, 2007). The younger people are when they start smoking, the greater their lifelong risk of developing smoking-related diseases. Most cigarette smokers (63%) start smoking prior to age 18. However, some recent evidence suggests that a larger proportion of tobacco users are now starting to smoke during the 18–25 age range (Klesges et al., 2006; Mayhew, Flay, & Mott, 2000; Tercyak, Rodriguez, & Audrain-McGovern, 2007; Wechsler, Rigotti, Gledhill-Hoyt, & Lee, 1998). It is speculated that this trend is due, at least in part, to policy changes that now

prohibit tobacco companies from marketing directly to children, resulting in a shift toward increased efforts to target young adults (Biener & Albers, 2004; Sepe & Glantz, 2002; Sepe, Ling, & Glantz, 2002).

Some people can get hooked after smoking just one cigarette.

The traditionally held view has been that it takes at least 2 to 3 years of regular smoking for nicotine dependence to develop. It was believed that only after establishing sufficient tolerance to the aversive effects of nicotine and gradually increasing the frequency of use could sufficient nicotine exposure levels occur to produce the physiological changes necessary for dependence. Recent data have challenged this belief. The central feature of nicotine dependence is the loss of autonomy, or the time at which quitting smoking requires effort or becomes uncomfortable (DiFranza, 2008). Several studies have demonstrated that the loss of autonomy among adolescent smokers occurs much more quickly than was previously recognized, and for most well before the onset of daily cigarette use (DiFranza et al., 2007; Scragg, Wellman, Laugesen, & DiFranza, 2008). In fact, Scragg et al. (2008) observed a loss of autonomy among 25–30% of adolescents who had smoked just one cigarette.

Once regular smoking is established and nicotine dependence has developed, it tends to follow a chronic course lasting years or even decades. In most cases, this is not due to a lack of interest in quitting. In fact, 90% of smokers regret that they ever started smoking, and they say they would not start again if given the opportunity to do things differently (Fong et al., 2004). Moreover, 70% of smokers indicate that they would like to quit smoking (CDC, 2002), and each year, approximately 40% make at least one quit attempt (CDC, 2008). Unfortunately, less than 5% of those who try to quit on their own achieve long-term abstinence following any given attempt, with most resuming smoking within the first week (Hughes et al., 2004). In this regard, nicotine dependence is best viewed as a chronic problem characterized by frequent relapse episodes. Fortunately, motivated smokers who persist in their attempts to quit frequently are successful. Among adults in the United States who have ever smoked cigarettes regularly, slightly more than half (52%) have stopped (CDC, 2008).

Nicotine dependence is best viewed as a chronic condition characterized by frequent and repeated episodes of relapse.

A primary reason individual quit attempts often fail is that few smokers take advantage of the evidence-based options that are available to help them quit smoking. For example, less than 10% of smokers use available psychosocial treatment options (e.g., individual or group counseling, and tobacco quitlines) when attempting to quit (Hughes, Marcy, & Naud, 2009), and only 20–40% take advantage of pharmacotherapies such as nicotine replacement therapy or bupropion (Hughes et al., 2009). While the reasons for the continued under-use of effective smoking cessation therapies are complex, influencing factors include lack of knowledge of these therapies and perceptions by patients that they are ineffective (Hammond, McDonald, Fong, & Borland, 2004). This limited penetration of evidence-based treatments into the population of tobacco users is also likely to be because of the lack of experienced tobacco cessation specialists marketing these services to patients and potential referral sources. This is unfortunate considering that success rates are greatly enhanced through the use of evidence-based clinical psychosocial and pharmacological treatments. These are discussed in detail in Chapter 4.

1.5 Differential Diagnosis

Nicotine withdrawal symptoms mimic those associated with mood, anxiety, and sleep disorders.

The primary differential diagnosis consideration for psychologists and other mental health professionals is whether or not current physical and psychological symptoms are part of nicotine and tobacco dependence or part of another mental disorder. The most prominent symptoms that are likely to be observed are those associated with nicotine withdrawal and include a dysphoric or depressed mood, insomnia, irritability, frustration or anger, anxiety, difficulty concentrating, restlessness, decreased heart rate, and increased appetite or weight gain (APA, 2000). Several characteristic symptoms of the nicotine withdrawal syndrome (depressed mood, sleep impairment, irritability, anxiety, difficulty concentrating, restlessness, and increased appetite or weight gain) can mimic those commonly associated with various mood, anxiety, and sleep disorders. It is most likely that there is a bi-directional relationship between the symptoms of nicotine dependence and mental disorders.

1.6 Comorbidities

Cigarette smoking is associated with a wide range of adverse health effects, including several types of cancer, cardiovascular disease, dental disease, respiratory illness, reproductive problems, erectile dysfunction, diseases of the eye, peptic ulcer disease, and diminished bone health (United States Department of Health and Human Services, 2004). In the United States, the official leading causes of death are cardiac disease, cancer, and stroke (Miniño, Arias, Kochanek, Murphy, & Smith, 2002). However, the *actual* causes of death are modifiable behavioral risk factors (Mokdad, Marks, Stroup, & Gerberding, 2004, 2005). Of these, tobacco use is the leading cause of death (18%), followed by poor diet and lack of physical activity (15%) and alcohol consumption (4%).

Tobacco use is strongly associated with a variety of psychiatric disorders. Smokers are more likely than nonsmokers to meet current criteria for mental health conditions such as mood disorders, anxiety disorders, other substance use disorders, and psychosis (Breslau, 1995; Degenhardt & Hall, 2001; Pratt & Brody, 2010), and individuals with psychiatric disorders are far more likely than the general population to smoke cigarettes. Adults in the United States with depression are about twice as likely to smoke (43% versus 22%; Pratt & Brody, 2010).

Table 1 shows the percentage of smokers found in two studies of individuals with psychiatric disorders (Lasser et al., 2000; Ziedonis et al., 2008). It has been estimated that those with one or more current psychiatric conditions smoke nearly half (44%) of all cigarettes consumed in the United States. Similar associations between cigarette smoking and mental disorders have been reported elsewhere (Lawrence, Mitrou, & Zubrick, 2009) including one study that found that 70–85% of schizophrenia patients use tobacco (Ziedonis et al., 2008).

People with psychiatric disorders smoke nearly half of all cigarettes consumed in the US.

Evidence also suggests that smokers with psychiatric disorders may have more difficulty quitting, offering at least a partial explanation for why smok-

Table 1
Cigarette Use Among Individuals With Psychiatric Disorder

Diagnosed psychiatric disorder	% of cigarette smokers
Schizophrenia	70–85%
Drug abuse or dependence	68%
Bipolar disorder	61%
Alcohol abuse or dependence	56%
Generalized anxiety disorder	55%
Agoraphobia	48%
Major depressive disorder	45%
Posttraumatic stress disorder	45%
Panic disorder	43%
Dysthymia	38%
Simple phobia	37%
Social phobia	32%
Lifetime history of any mental illness	35%
Any mental illness during the past month	41%
No history of mental illness	23%

Adapted from Lasser et al. (2000) and Ziedonis et al. (2008).

ing rates are higher in this population. Compared with those with no history of mental illness, lifetime smokers in the Lasser et al. (2000) study were significantly less likely ever to have quit smoking (31% versus 43%).

The mechanisms linking mental health conditions and cigarette smoking are complex and likely differ across each of the various disorders. The most commonly held view is that patients with mental health conditions smoke in an effort to regulate the symptoms associated with their disorder. However, some recent evidence suggests that quitting smoking may actually *improve* mental health symptoms (Blalock, Robinson, Wetter, Schreindorfer, & Cinciripini, 2008; Chengappa et al., 2001; Hitsman, Moss, Montoya, & George, 2009; Thorsteinsson et al., 2001). This is particularly true if the tobacco cessation intervention is integrated into the context of ongoing mental health treatment (Hall & Prochaska, 2009; McFall et al., 2005).

Quitting tobacco can improve mental health symptoms.

Overall, the implication for clinicians is that they should not be hesitant to encourage mental health patients to quit smoking. Not only will it help improve their physical health, but it may also improve, rather than exacerbate, their mental health. However, more serious psychiatric disorders may require a more intensive intervention with more frequent and longer treatment sessions (Gelenberg, de Leon, Evins, Parks, & Rigotti, 2008; Hitsman et al., 2009; Ischaki & Gratziou, 2009).

1.7 Diagnostic Procedures and Documentation

1.7.1 Assess Tobacco Use During Every Initial Evaluation

Effectively addressing issues related to nicotine dependence begins with a careful assessment of patients' tobacco use as part of every new patient evaluation. Naturally, the first step in effectively treating tobacco use and dependence is to identify those who use tobacco (Fiore et al., 2008). As a minimum, a system should be set up to identify and document tobacco use status for every patient at the initial intake appointment. This can involve tobacco screening items as part of intake or health history paperwork and asking about tobacco use as part of the clinical interview during the initial health care visit. Although this may seem obvious, a substantial proportion of providers do not systematically assess tobacco use in their patients, thereby losing an opportunity to intervene. A sample Nicotine and Tobacco Dependence Intake Form to include as part of the initial intake paperwork for all patients seen in mental health settings is included in Appendix 2.

1.7.2 Document Tobacco Use in Patient Records

After assessing tobacco use, it is important to document this information in the patient's medical or mental health record. Doing so will make it easier to intervene appropriately during future clinical encounters, and it will facilitate the tracking of changes in tobacco use status over time. In most large medical and dental settings, systems are already established to assist in this process. This is especially true in those health care settings with electronic medical records such as the US Veteran Affairs Health Care System and the US Department of Defense.

All forms of tobacco use should be documented in the patient's clinical record.

In many psychology private practices and other mental health settings, universal assessment of tobacco use during the initial assessment is not a current standard of practice – but it should be. Almost half of all of the tobacco consumed in the United States is by individuals with a mental health condition (Lasser et al., 2000; Lawrence et al., 2009; Ziedonis et al., 2008). Psychologists have the responsibility to ask about tobacco use and the opportunity to have a significant impact on both the psychological and physical health of their patients.

1.7.3 Nicotine Dependence Should Be Listed as a Clinical Diagnosis

In addition to documenting tobacco use or non-use in the clinical record, health care providers should list nicotine dependence as a clinical diagnosis if the appropriate diagnostic criteria are met. Listing nicotine dependence as a mental health or medical diagnosis will help highlight the significant importance of tobacco use to patients, health care providers, and those who pay for health care (e.g., insurance companies). Although many health care providers routinely assess tobacco use, very few actually list nicotine dependence as a DSM-IV-TR or ICD-10 diagnosis.

Don't just note tobacco dependence – diagnose it.

One study specifically evaluated the assessment and diagnosis of nicotine dependence in mental health and medical records (Peterson, Hryshko-Mullen, & Cortez, 2003). This study evaluated the frequency of documented assessment of smoking status and the diagnosis of nicotine dependence in a random sample of 153 mental health records and 152 medical records. The results indicated that tobacco use or non-use was routinely documented in 88% of the mental health records and 87% of the medical records. However, a diagnosis of nicotine dependence was listed in only 2% of the mental health records and 7% of the medical records for those patients with documented regular tobacco use at a level that should have met full diagnostic criteria according to the DSM and ICD.

These results suggest that clinicians do not routinely diagnose nicotine dependence even when diagnostic criteria are met. All health care providers, including psychologists working in private practice or outpatient mental health settings, should list nicotine dependence as a DSM or ICD diagnosis even if it is not the primary problem that is being addressed (Peterson et al., 2003). This will serve as a reminder to regularly reassess the patient‘s tobacco use status and interest in quitting.

1.8 Self-Report Measures of Nicotine Use and Dependence

Numerous self-report measures have been developed to aid in the assessment of nicotine dependence. Although the length of some of these instruments makes them better suited for research studies than clinical encounters, several brief measures exist that can be highly useful in developing appropriate treatment plans for smokers wishing to quit.

Assessment measures for nicotine dependence follow two commonly used approaches. The first approach involves determining whether a smoker meets formal diagnostic criteria for nicotine dependence. This involves systematically evaluating for the presence or absence of each of the individual symptoms or behaviors included in a given classification system (e.g., DSM-IV-TR or ICD-10) and determining whether an individual meets the necessary diagnostic criteria. This is typically done through a structured or semistructured interview, but it also can be accomplished using self-report checklists.

A second, dimensional approach is designed to evaluate the degree to which an individual exhibits features believed to be associated with nicotine dependence. Unlike the first approach, which is primarily designed to evaluate the presence or absence of required diagnostic criteria, the latter is geared toward determining a person’s level of nicotine dependence based on a continuous scale of measures empirically associated with tobacco dependence, such as the heaviness of tobacco use. Frequently used items in dimensional measures of nicotine dependence include the number of cigarettes smoked per day and the amount of time between waking and first tobacco use. These items are related to key elements of dependence such as tolerance, compulsive use, and withdrawal symptoms, but do not assess them directly. Scores on these measures are used to reflect the degree to which an individual is dependent on nicotine.

Several instruments have been designed specifically for the purpose of assessing whether or not a smoker meets DSM-IV-TR or ICD-10 diagnostic criteria for nicotine dependence. Within a clinical context, such measures may be important for formulating a diagnosis and facilitating third-party reimbursement for treatment. This process is often accomplished in a fairly informal manner by simply reviewing each of the individual items with patients to determine whether they meet DSM or ICD criteria. Although structured diagnostic interviews have been designed for this purpose, they are not highly utilized outside of research settings because of their length and the time and training required to administer them. Health care providers typically prefer a quick and simple assessment of diagnostic criteria that can be administered in the context of a routine clinical encounter.

Quick and simple assessment tools are available for busy health care providers.

1.8.1 Minnesota Nicotine Withdrawal Scale

The most widely used measure of nicotine withdrawal is the Minnesota Nicotine Withdrawal Scale (MWS; Hughes & Hatsukami, 1986). The MWS is a brief measure of the presence and severity of 15 symptoms associated with nicotine withdrawal. Patients are asked to rate the severity of each symptom on a scale from 0 (none) to 4 (severe). To track changes accurately over time, patients should be instructed to complete the measure for several days prior to their quit attempt and then daily thereafter. Ratings should be made at the end of the day to reflect their experiences over the previous 24 hours. A copy of the Minnesota Nicotine Withdrawal Scale – Revised (Hughes & Hatsukami, 2005) is provided in Appendix 3.

1.8.2 Tobacco Dependence Screener

One useful measure that allows for a quick and straightforward assessment for the presence of nicotine dependence is the Tobacco Dependence Screener (TDS; Kawakami, Takatsuka, Inaba, & Shimizu, 1999). The TDS (see Appendix 4) is a 10-item measure designed to screen for nicotine dependence according to ICD-10 and DSM-IV-TR diagnostic criteria. Smokers are assessed for the presence or absence of 11 characteristic symptoms of nicotine dependence: smoking more than intended, desire to quit smoking, unsuccessful efforts to quit smoking, craving for tobacco, withdrawal symptoms, smoking to avoid withdrawal symptoms, smoking despite serious illness, smoking despite health problems, smoking despite mental problems, feeling dependent on tobacco, and forgoing important activities for smoking. The number of symptoms that are endorsed is then summed to arrive at a total score. A score of five or more symptoms has been shown to have maximal sensitivity and specificity for identifying those who meet the ICD-10 definition of nicotine dependence, whereas a cutoff of six or more symptoms is optimal when using DSM-IV-TR diagnostic criteria. The TDS performs well as a screening measure for nicotine dependence based on ICD-10 criteria and moderately well for DSM-IV-TR criteria. TDS scores are also correlated with other indices of tobacco use (e.g., expired-air carbon monoxide levels, number of cigarettes

smoked per day, and years of smoking), and they have been shown to be predictive of the likelihood of quitting smoking.

1.8.3 Fagerström Test for Nicotine Dependence

The most widely used dimensional measure of nicotine dependence is the Fagerström Test for Nicotine Dependence (FTND; Heatherton et al., 1991). The FTND is a modified version of its predecessor, the Fagerström Tolerance Questionnaire (FTQ; Fagerström, 1978). The FTND is a brief, six-item measure that patients can complete quickly in the context of a clinical visit. In addition to assessing the average number of cigarettes smoked per day, the FTND also includes items to assess factors such as the time until smoking the first cigarette of the day, the tendency to smoke when ill, and difficulty in refraining from smoking in situations where it is not allowed. The individual items are presented in Appendix 5. Possible scores range from 0 to 10, with higher scores indicating greater levels of dependence. A score of ≥ 6 is generally taken as indicating high levels of nicotine dependence.

1.8.4 Heavy Smoking Index

Although the FTND itself is quite brief, an even shorter dimensional measure of nicotine dependence is often desirable in busy clinical settings where time and resources are limited. Under those conditions, the Heavy Smoking Index (HSI; Heatherton, Kozlowski, Frecker, Rickert, & Robinson, 1989) may be preferable. Although most often used in epidemiological studies, the HSI can also be beneficial in a clinical setting for rapidly assessing nicotine dependence. The HSI comprises two items from the FTND: (1) The number of cigarettes smoked per day, and (2) The time after waking until the first cigarette of the day is smoked. These two items have been shown to have the greatest predictive value in terms of forecasting success with quitting smoking, which is why they are frequently used in place of the full FTND. Scores on the HSI correlate strongly with total scores on the FTND, with scores of 4 or higher on the HSI corresponding to a score of 6 or higher on the FTND.

1.8.5 Cigarette Dependence Scale

Another highly useful and empirically supported self-report measure of nicotine dependence is the Cigarette Dependence Scale (CDS; Etter, Le Houezec, & Perneger, 2003). The CDS is a 12-item measure that was designed to correspond more closely to DSM-IV-TR and ICD-10 criteria for nicotine dependence while also retaining features similar to those included in the FTND (see Appendix 6). As such, the CDS represents a hybrid approach to assessment that includes elements of both diagnostic and dimensional assessment models. Accordingly, the CDS includes items to assess the compulsion or urge to smoke, withdrawal symptoms, loss of control, allocating excessive amounts of time to smoking, neglect of other activities

in favor of smoking, and persistence in smoking despite knowledge of the associated health risks.

Which measure is more useful? Each of the above described self-report measures has clinical utility for assessing nicotine dependence. The choice of measures is best determined based on the goals of the assessment. If the purpose is primarily to formulate a diagnostic impression, then the TDS or a clinical review of DSM-IV-TR or ICD-10 criteria are recommended. However, such measures typically do not provide an adequate index of severity of nicotine dependence across a continuous scale, nor is there good evidence to support their ability to predict severity of withdrawal symptoms or probability of relapse (Piper et al., 2006). The FTND and HSI have greater utility for predicting the probability of relapse and can be readily administered in a clinical setting. However, the reliabilities of the scales are suboptimal. Furthermore, while the FTND appears to be a good measure of the specific motivational aspects of nicotine dependence related to smoking in order to reduce withdrawal symptoms, it does not address or predict certain components considered to be central to dependence, such as the severity of withdrawal (Piper et al., 2006). The CDS – which combines features of continuous dependence severity scales such as the FTND and those designed to evaluate diagnostic criteria – possesses many of the advantages of both approaches to assessing dependence. The scale's brevity, good reliability, and both construct and predictive validity are additional strengths. Furthermore, recent evidence suggests that the CDS may possess superior psychometric properties to the FTND, although additional confirmatory studies are needed. In addition, because the CDS is a new measure, data supporting its utility in predicting cessation in various samples are currently limited (Piper et al., 2006).

Choose the assessment tool that best meets your and your patient's goals.

2

Theories and Models of Nicotine and Tobacco Dependence

A combination of physical, behavioral, and psychological factors influence tobacco use and dependence.

There are a variety of theories and models of nicotine and tobacco dependence (Shadel, Shiffman, Niaura, Nichter, & Abrams, 2000). This chapter is not intended to provide a thorough review of these theories and models. Rather, it provides a brief review of a model with direct relevance to practicing clinicians. There are three primary factors related to tobacco use and dependence: physical, behavioral, and psychological. People use tobacco because (1) they are addicted to nicotine (physical); (2) it has become a strongly ingrained habit (behavioral); and (3) they believe it helps them manage stress, solve problems, interact socially, and enjoy life (psychological).

2.1 Physical Factors in Tobacco Use

Physical factors in nicotine and tobacco dependence refer to the physiological, biological, or physical addiction component of tobacco use, with nicotine addiction being the primary physical factor (Bock & Marsh, 1990; Shadel et al., 2000). One of the reasons it is so difficult to quit tobacco is that nicotine is one of the world's most addictive substances. It enters the bloodstream and reaches the brain within seconds after smoking (Molyneux, 2004), stimulating the dopamine reward pathway in much the same manner as opiates (Britt & McGehee, 2008). This may help explain why individuals who have been addicted to both nicotine and heroin have had more difficulty quitting nicotine (Hser, McCarthy, & Anglin, 1994). Similarly, alcohol and nicotine are common comorbid addictions, and long-term follow-up studies of individuals with alcohol problems have indicated that they are more likely to die from tobacco use than alcohol (Costello, 2006; Hurt et al., 1996; Hurt & Patten, 2003; Littleton, Barron, Prendergast, & Nixon, 2007). The addictive properties of nicotine – in combination with the mass production, widespread distribution, easy availability, and relatively cheap cost of tobacco – have led it to become the deadliest drug in the world.

In a quit attempt, physical dependence on nicotine is actually the easiest barrier to overcome.

Most patients and health care providers assume that physical dependence on nicotine is the most significant barrier to successful quitting, but it may actually be the easiest to overcome. None of the physical withdrawal symptoms of nicotine are life threatening, as they can be with other drugs such as alcohol or opiates. They also are extremely short in duration. Once an individual quits all forms of nicotine, the physiologic withdrawal peaks during the first week and only lasts for about 2–4 weeks (Hughes, 2007). Any urges or cravings that occur beyond this point are related to behavioral or psychological factors, not