

Substance use disorders: *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DSM-IV) and *International Classification of Diseases*, tenth edition (ICD-10)

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ABSTRACT

Aims Two major nomenclatures, *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DSM-IV) and *International Classification of Diseases*, tenth edition (ICD-10), currently define substance use disorders for broad audiences of users with different training, experience and interests. A comparison of these definitions and their implications for DSM-V and ICD-11 has not been available. **Methods** The background for the dependence concept and abuse, harmful use, withdrawal, substance-induced disorders and remission and other substance-related conditions is reviewed. Reliability evidence is presented, as is validity evidence from approaches including psychometric, genetic and animal studies. The relevance of the DSM-IV and ICD-10 compared to alternative systems (e.g. the Addiction Severity Index) is considered. **Results** Reliability and psychometric validity evidence for substance dependence is consistently strong, but more mixed for abuse and harmful use. Findings on the genetics of alcohol disorders support the validity of the dependence concept, while animal studies underscore the centrality of continued use despite negative consequences to the concept of dependence. While few studies on substance-induced disorders have been conducted, those published show good reliability and validity when elements of DSM-IV and ICD-10 are combined. **Conclusions** Dependence in DSM-V and ICD-11 should be retained, standardizing both criteria sets and adding a severity measure. The consequences of heavy use should be measured independently of dependence; add cannabis withdrawal if further research supports existing evidence; conduct further studies of the substance-induced psychiatric categories; standardize their criteria across DSM-V and ICD-11; develop a theoretical basis for better remission criteria; consider changing substance 'abuse' to substance 'dysfunction disorder'; and conduct clinician education on the value of the diagnostic criteria.

Keywords Substance use disorder classification, alcohol use disorder, diagnostic criteria, reliability (research methods), validity (research methods), construct validity, longitudinal study, predictive validity, factor analysis.

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INTRODUCTION

Two major nomenclatures define substance use disorders for broad audiences of users with different training, experience and interests. The *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DSM-IV) was developed in the United States by the American Psychiatric Association, its publisher. DSM-IV is used in the United States and elsewhere. It includes only psychiatric disorders, including substance use disorders. The *International Classification of Diseases*, tenth edition (ICD-10) was

developed and published by the World Health Organization, is used mainly outside the United States and covers the entire range of medical disorders, of which one specific section covers psychiatric disorders. The ICD-10 section on psychiatric disorders includes substance use disorders.

Users of the substance use disorders sections of DSM-IV and ICD-10 include medically and behaviorally trained clinicians, neuroscientists, geneticists, investigators conducting clinical trials, epidemiologists, policy makers, insurance companies and others. Both DSM-IV and the research version of ICD-10 enable these diverse

groups to arrive at common definitions of disorders by providing specific, generally observable criteria for each disorder. Specifically for substance use disorders, DSM-IV and ICD-10 diagnostic criteria define two disorders, dependence and a secondary category, called abuse in DSM-IV and harmful use in ICD-10. DSM-IV and ICD-10 also provide substance-specific intoxication and withdrawal symptoms, and methods for diagnosing substance-induced psychiatric disorders. Considerable evidence is available to answer many questions about the reliability and validity of the substance use disorders as defined in DSM-IV and ICD-10, although some questions remain unanswered and require additional research.

BACKGROUND OF DSM-IV AND ICD-10 DEFINITIONS OF DEPENDENCE AND ABUSE/HARMFUL USE

The basis for these disorders originated in a paper on the alcohol dependence syndrome (ADS) [1]. The ADS was presented as a combination of psychological and physiological processes occurring on a continuum of severity, leading to heavy drinking increasingly unresponsive to adverse consequences. The ADS was considered one axis of alcohol problems, while social, legal and other adverse consequences of heavy drinking were considered another axis ('bi-axial') [2]. The bi-axial concept was generalized to all drugs of abuse [3]. The distinction between dependence and its conceptually distinct but empirically correlated medical, psychological, legal or social consequences has been interpreted as meaning that the consequences are independent or orthogonal [4]. The environmental and neurobiological processes leading to dependence may differ from the processes leading to development of some of the consequences of heavy use, potentially causing confusion in etiological research if these consequences are considered part of dependence. However, increasing severity of dependence is unlikely to be independent of the probability or severity of its consequences, leading to separate but correlated dimensions.

The bi-axial concept forms the basis of the definitions and distinction between dependence and abuse in DSM-III-R and DSM-IV and harmful use in ICD-10 [4,5]. DSM-IV criteria for dependence are similar to DSM-III-R and agree highly, although small changes in DSM-IV slightly elevated the threshold for dependence. The DSM-III-R workgroup considered omitting a secondary disorder, but concerns arose that individuals having alcohol or drug problems without a dependence syndrome could not be characterized for treatment or reimbursement if a secondary condition was not included. The problem was how to define such a condition. Due to the different emphasis on cross-cultural applicability, the systems resolved the issue of the secondary disorder in somewhat

different ways in DSM-IV and ICD-10 [4], as shown below.

CRITERIA FOR DEPENDENCE AND ABUSE/HARMFUL USE IN DSM-IV AND ICD-10

Dependence

As shown in Table 1, DSM-IV and ICD-10 criteria for substance dependence are similar, with criteria for tolerance, withdrawal, continued use despite problems and various indicators of impaired control. Each system requires at least three criteria to diagnose dependence, and co-occurrence of criteria within a 12-month period. The main difference between the two diagnoses is that 'a strong desire or sense of compulsion to drink' is an ICD-10 criterion but is not stated directly in DSM-IV. Further, 'difficulties controlling use in terms of onset, termination, or levels of use' is stated explicitly in the ICD 10, whereas DSM-IV does not use the specific language of 'onset' and 'termination' but rather includes 'drinking more or longer than intended' and 'a great deal of time spent getting, using or getting over the effects of the substance'. Despite these differences, if these two criteria sets describe the same underlying condition, then small differences between them should not produce large differences in their reliability, validity or concordance. We address this below.

Both DSM-IV and ICD-10 dependence criteria include 'continued use despite physical or psychological problems caused or exacerbated by the substance'. If one attends to the '*continued use despite . . .*' portion of the criterion, it indicates a process motivating continued use despite consequences that would cause non-dependent individuals to cease use, consistent with Edwards & Gross [1]. If one attends to the '*. . . physical or psychological problems*' portion, then the criterion indicates consequences. In DSM-IV and ICD-10, negative consequences are limited to physical or psychological problems and not extended to social or interpersonal problems.

Abuse/harmful use

ICD-10 and DSM-IV both treat abuse and dependence hierarchically—only individuals without dependence are diagnosed with abuse or harmful use. Otherwise, the criteria differ (Table 1). In DSM-IV, one of four abuse criteria is required. One of these criteria is hazardous use, use that elevates the risk of physical harm. In contrast, ICD-10 has only one criterion, harmful use, indicating physical or psychological harm has actually taken place ('hazardous use' of a substance was included in a prepublication version of ICD-10 and in the World Health Organization's 1994 *Lexicon of Alcohol and Drug Terms* [6], but was not included as a diagnostic criterion in the final version of ICD-10). The time frame for symptom expression in the

Table 1 Substance dependence and abuse/harmful use criteria: DSM-IV and ICD-10.

Dependence	ICD-10	DSM-IV
Clustering criterion	(a) Three or more of the following six symptoms occurring together for at least 1 month, or if < 1 month, occurring together repeatedly within a 12-month period	(a) A maladaptive pattern of substance use, leading to clinically significant impairment or distress as manifested by three or more of the following seven symptoms occurring in the same 12-month period
Tolerance	Need for significantly increased amounts of substance to achieve intoxication or desired effect or markedly diminished effect with continued use of the same amount of substance	Need for markedly increased amounts of substance to achieve intoxication or desired effect; or markedly diminished effect with continued use of the same amount of substance
Withdrawal	A physiological withdrawal state of the characteristic withdrawal syndrome for the substance, or use of the substance (or closely related) to relieve or avoid symptoms	The characteristic withdrawal syndrome from the substance or same substance (or a closely related) is taken to relieve or avoid withdrawal symptoms
Impaired control	Difficulties controlling use in terms of onset, termination, or levels of use; using in larger amounts or over a longer period than intended; or a persistent desire or unsuccessful efforts to reduce or control use	Persistent desire or one or more unsuccessful efforts to cut down or control use Using in larger amounts or over a longer period than the person intended
Neglect of activities	Important alternative pleasures or interests given up or reduced because of use; or	Important social, occupational, or recreational activities given up or reduced because of use
Time spent in substance-related activity	A great deal of time spent in activities necessary to obtain or use or to recover from its effects	A great deal of time spent in activities necessary to obtain, to use or to recover from the effects of use
Continued use despite problems	Persisting with use despite clear evidence and knowledge of harmful physical or psychological consequences	Continued use despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to be caused or exacerbated by use
Compulsion	Strong desire or sense of compulsion to use	None
Abuse	(a) (Harmful use) Clear evidence that substance use contributed to physical or psychological harm, which may lead to disability/adverse consequences (b) The nature of harm should be clearly identifiable (and specified) (c) The pattern of use has persisted for at least 1 month or has occurred repeatedly within a 12-month period (d) Symptoms do not meet criteria for any other mental or behavioral disorder related to substance in the same time period (except for acute intoxication)	(a) A maladaptive pattern of substance use, leading to clinically significant impairment or distress as manifested by at least one of the following occurring within a 12-month period Recurrent use of substance resulting in a failure to fulfill major role obligations at work, school, or home (e.g. repeated absences or poor work performance related to substance use; related absences, suspensions, or expulsions from school; neglect of children or household) Recurrent use in situations in which it is physically hazardous (e.g. driving an automobile or operating a machine when impaired by substance use) recurrent substance-related legal problems (e.g. arrests for related disorderly conduct) Continued substance use despite having persistent or recurrent social or interpersonal problems caused by or exacerbated by the effects of substance (e.g. arguments with spouse about consequences of intoxication) (b) Symptoms have never met criteria for substance dependence

two classifications is similar. DSM-IV explicitly includes 'clinically significant impairment or distress' for both dependence and abuse, while ICD-10 does not.

In DSM-IV, continued use despite social/interpersonal problems is an abuse criterion. Despite wording suggest-

ing the dependence process ('continued use despite . . .'), the criterion is usually understood as social consequences. ICD-10 omits this criterion entirely on the grounds that social or legal reactions to substance use vary across times and cultures (e.g. drug use leads to legal

problems in some eras or countries but not in others; heavy drinking leads to more criticism and marital conflict in some cultures than in others). Given the variability in reactions to substance use, these reactions were considered poor cross-cultural disorder indicators [4]. The rationale for continued use despite some problems but not others as a dependence indicator is questioned below under animal models, and the general idea of consequences is considered under alternative systems.

It is worth noting that the term 'abuse' in DSM-IV creates some confusion because it is also commonly used, although with different connotations, for abuse of people (child abuse and/or spouse abuse, experiences that commonly co-occur with heavy use of alcohol or drugs). In future versions of the DSM, changing the name of 'abuse' to a more explicitly substance-related term such as 'dysfunction' may alleviate such confusion.

WITHDRAWAL CRITERIA: DSM-IV AND ICD-10

Withdrawal criteria by substance

In DSM-IV and ICD-10, physical withdrawal is a dependence criterion for every substance except cannabis and hallucinogens. There are general criteria for withdrawal across substances, and substance-specific criteria.

In DSM-IV, general withdrawal criteria include: (1) development of substance-specific syndrome due to cessation of (or reduction in) heavy and prolonged substance use; (2) syndrome causes clinically significant distress or impairment in social, occupational or other important areas of functioning; (3) not due to general medical condition and not better accounted for by other mental disorder. In ICD-10, the first and third criteria are similar to DSM-IV. However, ICD-10 does not require clinically significant distress or impairment. ICD-10 states that symptoms and signs must be compatible with known features of withdrawal from the particular substance.

Substance-specific withdrawal criteria (Table 2) overlap considerably. The most common difference is that 'craving the same substance' (opiate, cocaine, nicotine, stimulants), present in ICD-10, is absent in DSM-IV. 'Headache' is included for ICD-10 but not DSM-IV alcohol and sedative withdrawal. DSM-IV and ICD-10 include 'malaise' as a symptom for cocaine and stimulant withdrawal, but ICD-10 also includes 'malaise' for alcohol, sedatives and nicotine. ICD-10 generally requires fewer symptoms than DSM-IV for withdrawal to be diagnosed. Relative validity of the differences is unknown.

Cannabis and hallucinogen withdrawal

Accumulating evidence from animal, laboratory and clinical studies (reviewed by Budney *et al.* [7]) supports

the validity of cannabis withdrawal. New epidemiologic evidence from a US national survey (Hasin *et al.*, under review) also supports a cannabis withdrawal syndrome: among 1119 frequent cannabis users who never abused other substances; a two-factor model was found. One factor was characterized by weakness, hypersomnia and psychomotor retardation (factor loadings 0.65–0.88). A second factor was characterized by anxiety symptoms (factor loadings 0.55–1.00). The two factors were moderately correlated (0.59). Cannabis withdrawal should be considered as an addition to DSM-V and ICD-11. To our knowledge, no corresponding syndrome has emerged for hallucinogens.

TEST-RETEST RELIABILITY OF ALCOHOL ABUSE AND DEPENDENCE DIAGNOSES

Many test-retest studies of DSM-IV and ICD-10 drug and alcohol dependence and abuse have been conducted in a range of samples, settings and diagnostic interviews. Results for DSM-IV (Table 3) consistently show good to excellent reliability for dependence. In fact, this is one of the most reliable diagnoses in DSM-IV. The limited exceptions occur for cannabis, hallucinogen, nicotine or for substances that were rare in the samples. When the dependence and abuse category are combined, reliability is high but lower than dependence alone. The reliability of abuse is more variable and generally lower than dependence. The range was from no better than chance agreement to excellent, with many studies showing poor to low-fair values.

Test-retest results for ICD-10 (Table 4) were similar to those for DSM-IV, with reliability of alcohol and drug dependence or a combined abuse/dependence diagnosis ranging from good to excellent. In fact, only two drugs (sedatives and cocaine) were below the good range in any time frame. Given the diversity in study designs, the consistent findings on the reliability of dependence indicate its robustness. Similar to DSM-IV, the reliability of ICD-10 harmful use was generally lower than that of dependence.

To understand more clearly the lower reliability of abuse/harmful use, recall that a diagnosis of abuse is not given to an individual who meets criteria for dependence. Some reliability studies [8,9] further examined the reliability of abuse criteria when considered independently from dependence. These indicated that the reliability of abuse or its symptoms was considerably improved when diagnosed as an independent category. These results indicate that part of the reliability problem with alcohol abuse stems from the category's conditional relationship to dependence rather than intrinsically unreliable criteria.

Table 2 Comparison of substance withdrawal symptoms.

		Symptoms																														
Substance		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
ALC																																
DSM-IV	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓																					
ICD-10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓																					
OPI																																
DSM-IV	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓										
ICD-10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓										
SED																																
DSM-IV	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓																				
ICD-10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓																				
COC																																
DSM-IV					✓	✓	✓	✓	✓	✓	✓															✓	✓					
ICD-10					✓	✓	✓	✓	✓	✓	✓															✓	✓					
NIC																																
DSM-IV								✓	✓	✓	✓	✓					✓										✓	✓				
ICD-10								✓	✓	✓	✓	✓					✓										✓	✓				
STIM* (includes amphetamines†)																																
DSM-IV					✓	✓	✓	✓	✓	✓	✓																	✓	✓			
ICD-10					✓	✓	✓	✓	✓	✓	✓																	✓	✓			

- *ICD-10 criteria; †DSM-IV criteria.
1. Tremor of the tongue, eyelids or outstretched hands
 2. Sweating
 3. Nausea, retching or vomiting, or abdominal cramps
 4. Tachycardia or hypertension/autonomic hyperactivity
 5. Psychomotor agitation/retardation
 6. Headache
 7. Sleep disturbance
 8. Malaise or weakness/lethargy and fatigue
 9. Transient visual, tactile, or auditory hallucinations or illusions
 10. Grand mal convulsions
 11. Anxiety
 12. Craving for same substance
 13. Rhinorrhea or sneezing
 14. Lacrimation
 15. Muscle aches or cramps
 16. Decreased heart rate
 17. Diarrhea
 18. Papillary/pupillary dilation
 19. Piloerection or recurrent chills
 20. Yawning
 21. Dysphoric mood
 22. Fever
 23. Postural hypotension
 24. Paranoid ideation
 25. Increased appetite
 26. Bizarre or unpleasant dreams
 27. Irritability or restlessness
 28. Increased cough
 29. Mouth ulceration
 30. Difficulty in concentrating

Table 3 DSM-IV test-retest reliability [1] of alcohol abuse and dependence diagnoses.

Study	ALCOHOL		CANNABIS		COCAINE		NonA DRUG		HALLUCINOGENS		HEROINE		NICOTINE		OPIATES		OPIATES (LICIT)		SEDATIVES		STIMULANTS	
	Current	Life	Current	Life	Current	Life	Current	Life	Current	Life	Current	Life	Current	Life	Current	Life	Current	Life	Current	Life	Current	Life
AUDADIS*																						
Camino <i>et al.</i> 1999, n = 169; Hispanic primary care patients: Puerto Rico																						
Dependence	0.79	0.66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Abuse	-0.01	0.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dependence or abuse	0.75	0.72	0.56	0.59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-hierarchical	0.66	0.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AUDADIS*																						
Chatterji <i>et al.</i> 1997, n = 495; general and substance treatment patients: India, Romania, Australia																						
Dependence	0.75	0.71	0.71	0.75	0.65	-	0.75	-	0.49	-	0.49	-	0.96	0.94	0.95	0.86	0.92	0.84	0.84	0.84	0.84	0.84
Abuse	0.49	0.47	0.70	0.44	0.54	-	0.44	-	0.72	0.55	-	0.36	0.26	0.74	0.63	0.74	0.74	0.53	0.53	0.53	0.53	0.53
AUDADIS* [2]																						
Grant <i>et al.</i> 1995, n = 664; urban community: USA																						
Dependence	0.75	0.63	0.94	0.70	0.99	-	0.89	-	0.73	0.81	-	0.87	0.83	0.63	0.60	0.66	0.57	0.80	0.77	0.77	0.77	0.77
Abuse	0.73	0.73	0.86	0.65	0.81	-	0.86	-	0.87	0.83	-	0.66	0.80	0.63	0.60	0.59	0.59	0.80	0.77	0.77	0.77	0.77
Dependence or abuse	0.76	0.73	0.78	0.71	0.91	0.68	0.79	0.66	0.66	0.80	0.66	0.83	0.79	0.63	0.60	0.62	0.56	0.80	0.78	0.78	0.78	0.78
AUDADIS*																						
Grant <i>et al.</i> 2003, n = 2657; general population: USA																						
Dependence	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dependence or abuse	0.74	0.70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AUDADIS*																						
Hasin <i>et al.</i> 1997, n = 296; substance and psychiatric treatment patients: USA																						
Dependence	0.76	0.75	0.63	0.66	0.72	0.72	0.76	0.76	0.86	0.80	0.86	0.80	0.63	0.60	0.59	0.59	0.66	0.57	0.80	0.77	0.77	0.77
Abuse	0.27	0.43	0.24	0.25	0.10	0.23	0.23	0.23	0.01	0.16	0.01	0.16	0.63	0.60	0.62	0.14	0.00	0.41	0.00	0.33	0.33	0.33
Non-hierarchical	0.79	0.79	0.70	0.68	0.76	0.76	0.76	0.76	0.83	0.79	0.83	0.79	0.63	0.60	0.62	0.56	0.42	0.67	0.80	0.78	0.78	0.78
AUDADIS-ADR* [3]																						
Vrasti <i>et al.</i> 1998, n = 149; substance and general care patients: Romania																						
Dependence	0.66	0.68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Abuse	0.45	0.49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CIDI-SAM ^{***}									
Horton <i>et al.</i> 2000, <i>n</i> = various [4]; white/black alcohol drinkers: USA									
Dependence	0.80/0.78lif	0.69/0.50lif	0.67/0.63lif	0.71/0.77lif	0.71	0.61	–	–	0.73
Non-hierarchical (individual criteria)	0.55-0.90/0.68-0.82	0.46-0.69/0.41-0.66	0.59-0.77/0.52-0.64	0.47-0.63/0.42-0.75	–	–	–	–	–
CIDI-SAM ^{***}									
Langenbucher <i>et al.</i> 1994, <i>n</i> = 201; substance use patients: north-east USA									
Dependence	–	–	–	–	0.71	0.61	–	–	0.73
M-CIDI [†]									
Wittchen <i>et al.</i> 1998, <i>n</i> = 60; community residents, age 14–28: Germany									
Dependence	–	0.78	–	–	–	–	–	–	0.64
Dependence or abuse	–	–	–	–	–	–	–	–	–
PRISM [†]									
Hasin <i>et al.</i> 1996a, <i>n</i> = 172; substance and dual diagnosis patients: USA									
Dependence	0.81	0.69	0.80	0.63	0.92	0.88	0.49	0.53	0.94
Abuse	0.32	0.18	0.51	0.50	-0.01	0.28	-0.01	0.40	1.00
PRISM [†]									
Hasin <i>et al.</i> 2006, <i>n</i> = 285; substance and dual diagnosis patients: USA									
Dependence	0.82	0.76	0.73	0.63	0.90	0.87	0.54	0.51	0.94
Abuse	0.56	0.52	0.42	0.48	0.50	0.33	-0.01	0.28	–
Non-hierarchical	0.80	0.77	0.66	0.69	0.88	0.88	0.54	0.95	0.90
SCAN ^{***}									
Easton <i>et al.</i> 1997 <i>n</i> = 287; community residents, substance treatment and general care patients: USA, Turkey									
Dependence	0.80	0.76	0.77	0.88	0.69	0.74	–	–	0.97
Abuse	0.53	0.63	0.57	0.65	–	–	–	–	–

[†]Test-retest reliability using different interviewers; ^{**}between-site reliability; ^{***}6-month follow-up.

1. Each subject evaluated with the same diagnostic interview by at least two independent interviewers at different times. Reliability represented by the kappa statistic, indicating chance-corrected agreement between independent assessments. Kappa values of 0.75 and higher indicate excellent reliability, values of 0.60–0.74 represent good reliability, values of 0.40–0.59 indicate fair reliability, and values of 0.39 or lower indicate poor reliability (Fleiss 1981).
2. This study did not report lifetime rates; table includes kappas for 'prior to last year' instead.
3. Only alcohol users are included in analysis.
4. There were 10 different sample sizes in the study ranging from 31 subjects to 191 subjects; a different sample for each drug category in both race categories.

Table 4. ICD-10 test-retest reliability [1] of alcohol abuse and dependence diagnoses.

Study	ALCOHOL		CANNABIS		COCAINE		NonA DRUG		HALLUCINOGENS		HEROINE		NICOTINE		OPIATES (LICIT)		SEDATIVES		STIMULANTS		
	Current	Life	Current	Life	Current	Life	Current	Life	Current	Life	Current	Life	Current	Life	Current	Life	Current	Life	Current	Life	
AUDADIS*																					
Chatterji <i>et al.</i> 1997, <i>n</i> = 495; general population and substance treatment patients: India, Romania, Australia																					
Dependence	0.77	0.73	0.69	0.69	-	0.60	-	-	0.72	0.70	-	-	0.93	0.94	-	-	0.84	0.85	0.94	0.87	
Abuse	0.37	0.15	0.67	0.41	-	0.19	-	0.75	0.49	-	-	-	-	-	-	-	0.62	0.58	0.30	0.38	
AUDADIS* [2]																					
Grant <i>et al.</i> 1995, <i>n</i> = 664; urban community participants: USA																					
Dependence	0.76	0.64	0.95	0.70	0.98	0.89	-	-	0.74	0.81	-	-	-	-	-	-	-	-	-	-	
Abuse	0.63	0.66	0.92	0.87	0.93	0.64	-	-	0.71	0.77	-	-	-	-	-	-	-	-	-	-	
Dependence or abuse	0.62	0.68	0.82	0.69	0.93	0.60	0.80	0.56	0.67	0.79	-	-	-	-	-	-	-	-	-	-	
AUDADIS-ADR* [3]																					
Vrasti <i>et al.</i> 1998, <i>n</i> = 149; substance and general care patients: Romania																					
Dependence	0.71	0.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Abuse	0.48	0.38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CIDI-Auto*																					
Rubio-Stipec <i>et al.</i> 1999, <i>n</i> = 286; treated alcohol drinkers: Australia and Puerto Rico																					
Dependence	0.71	0.71	0.79	0.71	0.92	0.83	-	-	0.85	0.92	-	-	0.85	0.92	-	-	0.62	0.70	0.66	0.73	
Abuse	0.36	0.58	0.62	0.45	0.54	0.46	-	-	-	-	-	-	-	-	-	-	-	-	-	0.66	
CIDI†																					
Ustun <i>et al.</i> 1997, <i>n</i> = 288; general population and substance treatment patients: San Juan and Sydney																					
Dependence	-	0.75	-	0.69	-	0.76	-	-	0.79	-	-	-	-	0.80	-	-	-	0.48	-	0.76	
Abuse	-	0.60	-	0.41	-	0.50	-	-	0.72	-	-	-	-	-	-	-	-	-	-	0.62	
SCAN**																					
Easton <i>et al.</i> 1997 <i>n</i> = 287; community residents, substance treatment and general care patients: USA, Turkey																					
Dependence	0.85	0.79	0.77	0.78	0.69	0.74	-	-	-	-	-	-	0.97	0.98	-	-	-	-	-	-	
Abuse	0.20	0.36	0.57	0.40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SDSS* [4]																					
Miele <i>et al.</i> 2001, <i>n</i> = 137 (alc), 68 (can), 92 (coc), 74 (her); treated substance users: USA																					
Dependence	0.78	-	0.73	-	0.54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Abuse	0.61	-	0.43	-	0.49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

*Test-retest reliability using different interviewers; **between-site reliability.

1. Each subject evaluated with the same diagnostic interview by at least two independent interviewers at different times. Reliability represented by the kappa statistic, indicating chance-corrected agreement between independent assessments. Kappa values of 0.75 and higher indicate excellent reliability, values of 0.60-0.74 represent good reliability, values of 0.40-0.59 indicate fair reliability, and values of 0.39 or lower indicate poor reliability (Fleiss 1981).

2. This study did not report lifetime rates; table includes kappas for 'prior to last year' instead.

3. Only alcohol users are included in analysis.

4. This study was not clear whether the kappas were for life-time or current rates.

VALIDATION OF DEPENDENCE AND ABUSE

Psychometric validation: multi-method comparisons

In practical terms, high concordance between DSM-IV and ICD-10 would suggest that despite minor differences in criteria, rates and results can be compared across studies. In theoretical terms, high concordance would suggest that both nomenclatures tap the same underlying construct or condition, supporting its validity. Numerous studies addressed DSM-IV/ICD-10 concordance (Table 5). Across substances, studies and time-frames, DSM-IV and ICD-10 diagnoses of dependence show excellent agreement. In contrast, more than three-quarters of the abuse/harmful use comparisons show poor agreement. Agreement was also poor for non-hierarchical abuse/harmful use diagnoses, indicating that the criteria themselves simply did not agree well. Concordance of DSM-IV and ICD-10 combined diagnoses (abuse/harmful use or dependence) was intermediate between dependence and abuse/harmful use.

Within age, sex and ethnic groups, ICD-10/DSM-IV concordance was addressed using National Longitudinal Alcohol Epidemiologic Study (NLAES) data ($n = 42\,086$). Grant [10] examined this for alcohol, cannabis and 'any drug'. We extended this for cocaine, stimulants, tranquilizers, hallucinogens and sedatives (unpublished tables available from first author upon request). DSM-IV/ICD-10 concordance for dependence was very good to excellent across substances, time-frames and demographic groups. In contrast, abuse/harmful use diagnoses showed poor-fair concordance. For some substances (e.g. abuse of sedatives, hallucinogens, stimulants, tranquilizers) the n was too small to be informative. Curiously, for every substance and time-frame, DSM-IV/ICD-10 agreement was higher for blacks than for non-blacks. DSM-IV/ICD-10 agreement for combined diagnoses (abuse and/or dependence) ranged from good to excellent.

Several studies [11,12] examined validity of DSM-IV and ICD-10 diagnoses by calculating between-measure agreement. Measures included the Composite Diagnostic Interview (CIDI), Schedule for Clinical Assessment in Neuropsychiatry (SCAN), Alcohol Use Disorders and Associated Disabilities Interview (AUDADIS), Psychiatric Research Interview for Substance and Mental Disorders (PRISM), Structured Clinical Interview for DSM-IV Disorders (SCID) and longitudinal, expert, all data (LEAD) procedure; studies included patients and non-patients in the United States, Luxembourg, Athens and Madrid, incorporating samples of 105–420 individuals. Between-measure agreement tended to be better for DSM-IV than ICD-10; for DSM-IV, 35% of kappas were good or excellent; only 9% were good (none were excellent) for ICD-10. Dependence diagnoses showed fair to excellent between-measure concordance for alcohol (0.61–0.80),

and cocaine (0.45–0.81). Cannabis and amphetamine dependence showed low to fair concordance across studies (cannabis 0.35–0.67; amphetamine 0.36–0.54). Concordance for abuse was very low, with 80% of kappas 0.00–0.20.

Psychometric validation: longitudinal studies

Many clinicians assume that abuse is an early stage of dependence, in which case there is little reason for two separate diagnoses. However, if abuse and dependence each have a distinctive course, then the validity of their separation is supported. This was first addressed prospectively in an analysis of national data [13]. Subjects diagnosed with abuse at baseline were unlikely to become dependent 4 years later. Instead, most remitted, while dependence cases tended to be chronic. These results were replicated in prospective studies of college men [14], relatives of alcoholics [15], a national survey of youth [16] and a community sample of heavy drinkers [17]. The studies support the abuse/dependence distinction for alcohol; work of this type is needed for drug abuse and dependence.

Psychometric validation: factor analytical and latent class studies

Factor and latent class analyses of alcohol use disorders

Early studies did not take account of methodological issues, such as the need for large samples when analyzing binary variables and problems arising when the sample is defined by characteristics included in the analysis [18–20]. Factor analyses of abuse and dependence in the general population avoid these problems. The first of these studies [21] found a single factor, although the data set was small and not designed initially to assess DSM-III-R or DSM-IV criteria. In a much larger national sample with items designed specifically for DSM-III-R and DSM-IV criteria, Muthén and colleagues [22] found two separate factors generally corresponding to dependence and abuse that showed stability in structure across drinkers, heavy drinkers and problem drinkers. These two factors were correlated (~ 0.74). Very similar results were found using data from the National Longitudinal Study of Youth [23], assessed in adulthood for the criteria. These results are consistent with the conceptualization of dependence described at the beginning of this paper.

Two latent class analyses have been conducted with well-characterized, large samples. In a sample of male and female relatives of treated alcoholics in a genetics study [24], four classes were found, generally describing graded severity. While these results are not consistent with the DSM-IV division between abuse and dependence, it is not clear how the requirement for a relative with severe

SCID
Pollock *et al.* 2000, *n* = 413, community and clinical adolescent participants; Pittsburgh

Dependence	-	0.81	-	-	-	0.76	-	0.83
Abuse	-	0.06	-	-	-	0.29	-	0.07
Dependence or abuse	-	0.55	-	-	-	0.16	-	0.07
Non-hierarchical	-	0.10	-	-	-	0.59	-	0.44
SSAGA [3]								
Schuckit <i>et al.</i> 1994, <i>n</i> = 1922, alcohol-dependent probands and relatives from random population, medical and dental clinics; COGA sample, USA								
Dependence	-	0.71	-	0.78	-	0.76	-	0.75
Abuse	-	0.05	-	0.05	-	0.04	-	0.16
Dependence or abuse	-	0.44	-	0.39	-	0.51	-	0.59

1. Each subject evaluated with the same diagnostic interview by at least two independent interviewers at different times. Reliability represented by the kappa statistic, indicating chance-corrected agreement between independent assessments. Kappa values of 0.75 and higher indicate excellent reliability, values of 0.60–0.74 represent good reliability, values of 0.40–0.59 indicate fair reliability, and values of 0.39 or lower indicate poor reliability (Fleiss 1981).
2. DSM-IV criteria were still under development at the time of this study; they are not exactly like the finalized criteria. This study appears to compare lifetime DSM-IV diagnosis to current ICD-10 diagnosis.

alcoholism may have affected generalizeability. In male Australian twins, a five-class solution was selected: one class with none or very infrequent problems, one class characterized by hazardous use and drinking more than intended (closest to abuse) and three dependence-like classes with graded severity [25]. This model is more consistent with the DSM-IV abuse/dependence distinction.

Factor analyses of drug disorders

Factor analyses of drug use disorders have been developed less extensively. A recent study by Teesson *et al.* [26] analyzed DSM-IV cannabis dependence and abuse criteria in 722 untreated cannabis users. They found two factors so highly correlated (0.99) that a one-factor model was preferred. While the analysis and interpretation were thoughtful in this study, the sample was small for binary variables.

In larger samples, DSM-IV marijuana and cocaine dependence and abuse criteria were analyzed with 5808 life-time marijuana users and 1593 cocaine users in the US national NLAES survey (C. Blanco *et al.* under review).

Marijuana

Weighted exploratory factor analysis indicated a large factor accounting for ~60% of the variance, and a smaller factor accounting for ~7% of the variance. χ^2 tests of model fit indicated that the two-factor and one-factor solution both fitted the data, with a smaller root mean square residual (RMSR) for the two-factor model (smaller values of RMSRs are preferred). The abuse factor had large loadings on three criteria: failing to fulfill role obligations, hazardous use, and social problems. Other criteria loaded on dependence. The two factors were correlated (0.73), although not as highly as in Teesson *et al.* [26].

Cocaine

Weighted exploratory factor analysis indicated a large factor accounting for ~70% of the variance, and a smaller factor accounting for ~6% of the variance. Similar to the results for cannabis, both the one- and two-factor solutions fitted the data and again, the RMSR was smaller for the two-factor solution. The abuse factor had large loadings on two criteria: failure to fulfill role obligations and hazardous use. Other criteria loaded on dependence. The two factors were correlated (0.77).

Conclusion

Both marijuana and cocaine dependence criteria describe valid dependence syndromes that are graded in severity rather than categorical. While parsimony might suggest combining the abuse and dependence factors because of their correlations, the significance tests of model fit and

RMSRs suggest that abuse criteria describe a related yet somewhat distinct phenomenon from dependence.

Psychometric validation: construct validation studies

Studies of this type compare individuals with abuse or dependence to non-diagnosed drinkers or drug users on hypothesized correlates of a serious substance use disorder [13]. In an all-male sample, alcohol abuse and dependence had similar correlates, although associations were weaker for abuse [15]. Two gender-balanced studies included a community sample of 962 heavy drinkers [27] and a national sample of current drinkers [28]. In both, alcohol dependence had strong, significant associations with family history of alcoholism, suicidal ideation, blackouts and drinking volume, correlates of a serious disorder. Associations with alcohol abuse were weaker and less often significant. Also, in former drinkers in a national sample, past DSM-IV alcohol dependence but not abuse predicted current major depressive disorder [29]. These findings show equivocal evidence for alcohol abuse, but consistent support for the validity of alcohol dependence as a serious alcohol use disorder. More evidence of this type is needed for drug use disorders.

Validation: etiological findings from genetic studies

Twin studies have indicated a genetic component to alcohol dependence [30,31] and to dependence on other drugs [32,33]. With regard to specific genes, however, when DSM-IV and ICD-10 were in preparation, little was known aside from Asian studies on alcohol metabolizing polymorphisms (ADH1B and ALDH2). Since then, with the explosion of knowledge and methods in genetics, this picture has changed. The Collaborative Study on the Genetics of Alcoholism (COGA) family genetics study is now a major source of information on the genetics of alcohol dependence and related conditions. Via the National Institute for Drug Abuse (NIDA) Genetics Consortium, knowledge should catch up on specific genetic contributions to drug use disorders.

Strong validation of the disorder comes from changes in dependence risk due to genetic variation affecting proteins implicated in the dependence process. Variation in single nucleotide polymorphisms (SNPs) in the γ -aminobutyric acid [GABA(A)] receptor gene (GABRA2) have shown strong relationships to alcohol dependence in three genotyping studies in US [34,35] and Russian [36] populations. Covault *et al.* [35] also suggested that results were specific to alcohol dependence, as elimination of cocaine-comorbid subjects strengthened the results. Numerous other findings are emerging on GABA receptor genes [37]. These findings support the validity of the clinical alcohol dependence phenotype, although biologically based endophenotypes may eventually offer more or complementary information.

Validation: animal models

Animal models for excess consumption have existed for some time, including high- and low-alcohol-preferring rat lines from Indiana University, heavy-drinking primates (e.g. the work of Grant [38]) and high- and low-cocaine self-administering rats (i.e. the work of Koob [39]). These animal models play an important role in medication development. However, animal models of a dependence syndrome of symptoms were developed further in two recent papers. Deroche-Gamonet and colleagues [40] demonstrated three cocaine dependence-like behaviors in rats. One was sustained persistence of drug-seeking after non-availability was signaled (difficulty stopping or limiting use). The second was quantitatively increasing efforts to get the drug without giving up as the drug became harder to obtain (a lot of time spent obtaining the drug). The third was use continued despite harmful consequences (in this case, use despite knowledge that foot-shock was paired with use). Not all the rats evidenced these behaviors. Instead, they arose mainly among a susceptible subset, with susceptibility defined by rapid reinstatement of use patterns after acclimation to use, withdrawal of drug availability and renewed access. Importantly, none of the rats evidenced dependence behaviors after brief exposure to drug access, but only after prolonged access. The fact that non-susceptible rats reduced their drug use greatly when paired with foot-shock while susceptible rats showed little reduction in their drug use suggests that despite awkwardness in question wording within human studies, the concept of continued use despite knowledge of problems is valid across species. If this is the case, it is reasonable to assume that it is also valid cross-culturally among humans. Vanderschuren & Everitt [41] also demonstrated dependence-like behaviors in rats, again only after prolonged access to self-administration.

Animal models of substance use have contributed much to the study of etiology/treatment of substance dependence, and they may contribute further by suggesting refinements of the diagnostic criteria. Of course, foot-shock is neither a medical, psychological, social or legal consequence of use, but rapid-reinstating rats who learn that foot-shock accompanies drug use but continue use anyway provide compelling evidence of dependence. Perhaps DSM-V/ICD-11 could be improved by taking the two existing criteria, 'continued use despite physical or psychological problems' (dependence) and 'continued use social or interpersonal problems' (abuse) and combining them into a single criterion, 'continued use despite serious negative consequences' for dependence, with future research addressing whether this could be considered a defining characteristic of alcohol or drug dependence in humans.

SUBSTANCE-INDUCED DISORDERS IN DSM-IV AND ICD-10

Substance-induced disorders are an important area that is approached differently in DSM-IV and ICD-10. For Axis I psychotic, affective and anxiety disorders, DSM-IV requires: (a) a prominent symptom of the disorder group (e.g. hallucinations or delusions, depressed or elevated mood, anxiety, panic attacks, or obsessions or compulsions); (b) evidence from the history, physical exam, or lab findings that either the symptoms developed during or within a month of substance intoxication or withdrawal, or that the 'disturbance' was etiologically related to the 'medication' use; (c) the 'disturbance' is not better accounted for by a disorder that is not substance-induced; and (d) symptoms cause clinically significant distress or impairment in social, occupational or other important areas of functioning. DSM-IV therefore does not require that all other criteria for the disorder be met. DSM-IV does not include substance-induced personality disorders.

ICD-10 is similar in some ways, requiring that a substance-induced disorder be clearly related to substance use. In cases where onset of the disorder occurs after use of psychoactive substances, strong evidence is required to demonstrate a link. In contrast to DSM-IV, ICD-10 requires that full criteria for the disorder must be met in terms of numbers of symptoms and duration. ICD-10 also differs from DSM-IV in that it allows for substance-induced personality disorders. Finally, in ICD-10, for a substance-induced psychotic disorder, the criteria are quite specific: (a) onset of psychotic symptoms during or within 2 weeks of use; (b) symptoms must last longer than 48 hours and (c) the disorder must last less than 6 months. Given the level of clinical interest in improved methods of assessment and treatment for psychiatric disorders comorbid with substance use disorders, surprisingly little attention has been given to the reliability or validity of the substance-induced disorder definitions provided in DSM-IV or ICD-10. To our knowledge, only one study [42] tested the reliability of these disorders. In this study, the PRISM was used, as it was structured specifically to operationalize DSM-IV substance-induced as well as primary criteria. To assure adequate reliability, the PRISM differs from DSM-IV but shares with ICD-10 the requirement that for substance-induced disorders to be diagnosed, full diagnostic criteria for the base disorder must also be met. In a test-retest study of 285 substance abuse and psychiatric patients, many substance-induced diagnoses (disorders such as major depression and psychosis) were nearly as reliable as primary diagnoses, which were highly reliable in the PRISM. Further, a LEAD validity study in Spain comparing PRISM to the less structured SCID approach to substance-induced

disorders [12] showed better reliability for the PRISM in substance-abusing psychiatric patients.

REMISSION CRITERIA

ICD-10 gives undefined remission categories (early, partial or full remission). DSM-IV details early (less than 12 months) versus (12 months or longer) and full (no abuse or dependence criteria) versus partial (one or more abuse or dependence criteria) remission. Thus, according to DSM-IV, dependence can be in early full remission, early partial remission, sustained full remission or sustained partial remission. DSM-IV and ICD-10 also offer categories for those in a controlled environment such as treatment, prison or a hospital. Little is known about the adequacy of these categories, and they are seldom used. Given the need for adequate measures for treatment studies, definitions of remission warrant further study in both nomenclatures.

USERS OF THE DSM-IV AND ICD-10 AND ALTERNATIVE SYSTEMS

Here we consider the relevance of DSM-IV or ICD-10 definitions of substance use disorders and supporting evidence to users of the nomenclatures, including clinicians, insurance companies, neuroscientists, geneticists, treatment researchers, epidemiologists and policy makers. We also consider other assessment approaches and their relevance.

Clinicians

Informal input from US clinicians working in non-research alcohol and/or drug treatment settings (including those affiliated with NIDA's Clinical Trials Network) indicates that many see DSM-IV and ICD-10 definitions as irrelevant to their work. Learning the definitions is part of professional training, but the assessments themselves are part of 'paperwork' and patients seen in these settings are all assumed to be dependent. Diagnoses for 'secondary' substances are often not made systematically, and the main diagnosis does not play a role in treatment planning. An exception is withdrawal, which is assessed to determine if specific treatment is warranted. Many clinicians in generalist settings where alcohol and drug abusing patients are often treated (e.g. emergency rooms, primary care) also do not assess substance use or substance use disorders carefully for a variety of reasons [43,44].

Insurance companies

These require diagnoses to reimburse for treatment; a mild-sounding diagnosis is less reimbursable. Altering or removing diagnoses may affect treatment availability.

Scientists

Neuroscientists and geneticists need a valid common definition of the condition they study to define groups as homogeneous as possible; heterogeneity complicates their work. In the absence of biological endophenotypes that can be used across studies, these investigators regularly use the DSM-IV dependence diagnosis, assessed in a structured manner. They rarely use the abuse category by itself, and because the distinctions between abuse and dependence are increasingly recognized neuroscientists and geneticists now seldom combine abuse and dependence as a single phenotype. (Because the seven dependence criteria can theoretically yield a diagnosis from 99 criteria combinations [45], many consider dependence heterogeneous. However, in a US national sample, six combinations of the DSM-IV alcohol dependence criteria accounted for the large majority of dependence cases, all including physiological and impaired control criteria).

Treatment researchers

The attitude of such researchers towards DSM-IV or ICD-10 diagnoses varies widely. Some use diagnoses only because they are a common requirement for research. Others feel that the dependence diagnosis is useful in designing a sample with a known, important defining clinical characteristic. Even medication-oriented clinical investigators may believe that a fully assessed diagnosis of dependence is not necessary in a clinical trial, assuming that all patients in treatment are dependent. Recent National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) findings suggest that this is not the case for drug patients [46]. Instead, many patients have past but not current diagnoses; others are in treatment due to external circumstances regarding drug use but do not actually meet criteria for dependence.

Epidemiologists

This group needs a reliable, valid nomenclature in order to provide accurate rates, time trends, subgroup differences in populations, the need for and use of health services and (among genetic epidemiologists) phenotypes useful for genetics studies.

Policy makers

Although these are not a unitary group, in general policy makers can be defined as those allocating funds and other resources to prevention and treatment. It has been suggested that this group is not especially interested in dependence, *per se*, but rather whether treatment reduces the social and legal consequences of substance use disorders. As such, many policy makers are interested in the Addiction Severity Index (ASI), a standard intake assessment form in most treatment facilities in the United States.

The Addiction Severity Index (ASI) [47,48] includes simple measures of use frequency and five problem areas (consequences) commonly affected by addiction: physical health, psychiatric status (distress), family/social environment, employment/financial support and legal. It is the most widely used instrument in US substance abuse clinics [49], and is used increasingly in other countries. In particular, the EuropASI, a somewhat modified version, is used by many treatment facilities for clinical assessment, registration, research and management [50]. The ASI has been translated into numerous languages, with generally good reliability and validity across modified versions (e.g. Dutch: Hendricks *et al.* [51]; German: Scheurich *et al.* [52]; and French: Krenz *et al.* [53]). Lower reliability/validity is more likely in special populations such as dual-diagnosis patients or the homeless. Most ASI sections were reliable in Dutch alcoholics [54], and while some areas of the ASI had cross-cultural problems in Kuwaiti substance abusers, much of the instrument's validity was excellent [55]. Despite non-specific concerns about cultural insensitivity [56,57], the ASI is now used in studies in Taiwan [58], Iran [59], Pakistan [60], Amsterdam [61], Italy [62], Spain [63] and Israel [64]. NIDA is funding work by McLellan & Alterman to study and enhance ASI validity in Mexico and South America [65]. Given the widespread use of the ASI, it may be useful to determine if anything can be learned from it that can be applied to the DSM-V/ICD-11 development process, especially for the non-dependence category. Possible ideas include assessment of consequences of substance use regardless of whether dependence is present or not, and differentiation of consequences into the five areas covered by the ASI.

RECOMMENDATIONS

As we consider the extensive work that has already been conducted to understand the diagnostic profiles of substance use disorders, the following serve as recommendations:

- 1 Retain substance dependence as a category. Standardize the criteria across DSM-V and ICD-11.
- 2 Consider a severity measure based on a count of DSM-V/ICD-11 criteria, to ensure continued standardization of the severity measure and a close link to the binary diagnostic categories (e.g. Helzer *et al.* [66] and Hasin *et al.* [67,68]). While more complex severity rating schemes can doubtless be devised, these may be more applicable to specialized uses while a simple severity indicator is likely to be more widely used.
- 3 Conduct further reliability and validity studies of cannabis withdrawal, and if supported, add it to

DSM-V and ICD-11, using the same criteria in both nomenclatures.

- 4 Investigate whether the briefer symptom set of withdrawal symptoms for each substance in ICD-10 is as informative as the longer symptom set of withdrawal symptoms in DSM-IV, and use a standard set that is most parsimonious in DSM-V and ICD-11.
- 5 Conduct further reliability and validity studies of the substance-induced psychiatric categories. Consider making DSM consistent with ICD in requiring that full criteria for the primary disorder (e.g. duration, symptom count) must be met to make a substance-induced diagnosis, in addition to chronologically plausible substance involvement.
- 6 Carry out theoretical work leading to empirical studies of remission criteria to provide improved measures of this aspect of course in DSM-V and ICD-11.
- 7 Plan and carry out clinician education programs on the value of careful assessment of current and past dependence and abuse for all substances, so that evidence-based treatments can be applied to patients with evidence-based diagnoses. Design such programs to be suitable for specialist as well as generalist settings.
- 8 Measure consequences of heavy substance use (medical, psychological, social, occupational, legal) independently of dependence, either with the existing DSM-IV abuse criteria, or with an instrument such as the ASI.
- 9 Consider a name change for substance abuse to 'substance dysfunction disorder' to avoid the confusion of substance 'abuse' with other types of abuse.
- 10 Conduct future research addressing whether 'continued use despite serious negative consequences' could be considered a defining characteristic of alcohol or drug dependence in humans.

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