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# *C) Insomnia*

# Clinical Diagnoses in 216 Insomnia Patients Using the International Classification of Sleep Disorders (ICSD), DSM-IV and ICD-10 Categories: A Report From the APA/NIMH DSM-IV Field Trial

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**Summary:** Three diagnostic classifications for sleep disorders have been developed recently: the International Classification of Sleep Disorders (ICSD), the Diagnostic and Statistical Manual, 4th edition (DSM-IV), and the International Classification of Diseases, 10th edition (ICD-10). No data have yet been published regarding the frequency of specific diagnoses within these systems or how the diagnostic systems relate to each other. To address these issues, we examined clinical sleep disorder diagnoses (without polysomnography) in 257 patients (216 insomnia patients and 41 medical/psychiatric patients) evaluated at five sleep centers. A sleep specialist interviewed each patient and assigned clinical diagnoses using ICSD, DSM-IV and ICD-10 classifications. "Sleep disorder associated with mood disorder" was the most frequent ICSD primary diagnosis (32.3% of cases), followed by "Psychophysiological insomnia" (12.5% of cases). The most frequent DSM-IV primary diagnoses were "Insomnia related to another mental disorder" (44% of cases) and "Primary insomnia" (20.2% of cases), and the most frequent ICD-10 diagnoses were "Insomnia due to emotional causes" (61.9% of cases) and "Insomnia of organic origin" (8.9% of cases). When primary and secondary diagnoses were considered, insomnia related to psychiatric disorders was diagnosed in over 75% of patients. The more narrowly defined ICSD diagnoses nested logically within the broader DSM-IV and ICD-10 categories. We found substantial site-related differences in diagnostic patterns. These results confirm the importance of psychiatric and behavioral factors in clinicians' assessments of insomnia patients across all three diagnostic systems. ICSD and DSM-IV sleep disorder diagnoses have similar patterns of use by experienced clinicians. **Key Words:** ICSD—DSM-IV—ICD-10—Insomnia.

Many sleep disorders clinicians have begun to use the International Classification of Sleep Disorders (ICSD) (1) since its introduction in 1991. The ICSD differs from its predecessor, the Diagnostic Classification of Sleep and Arousal Disorders (DCSAD) (2), in several important ways: 1) it presents a larger number of disorders (88 vs. 68), 2) disorders are arranged by presumed pathophysiology rather than presenting symptom, and 3) it includes specific clinical and suggested polysomnographic criteria. However, we know of no published empirical research evaluating clinicians' use of the ICSD to date.

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The American Psychiatric Association will publish the next edition of its nosology, the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV), in 1994. Like its predecessor, DSM-III-R (3), DSM-IV will include a section of sleep disorders with specific clinical criteria. DSM-IV will include a larger number of diagnoses than DSM-III-R (23 vs. 14), and, like ICSD, it will be organized on the basis of presumed pathophysiology rather than presenting complaint. The World Health Organization is also preparing a new classification system [International Classification of Diseases, 10th edition (ICD-10)], which includes sleep disorders of both nonorganic and organic origins; the former have explicit diagnostic criteria. As part of the development of DSM-IV, focused field trials were organized to evaluate the proposed diagnoses. The current report originated in the DSM-IV sleep disorders field trial, which focused on interrater reliability of DSM-IV and ICD-10 diagnoses assigned to patients with insomnia complaints. The major results of this study have been reported elsewhere (4).

A secondary aim of the field trial—to compare sleep specialists' diagnoses using ICSD, DSM-IV and ICD-10—is the focus of this report. We were also interested in site-related differences in the diagnostic patterns. This information will be helpful in examining how clinicians actually use each system; how the ICSD, DSM-IV and ICD-10 systems relate to one another; and how each system relates to previous nosologies, such as the DCSAD. These goals are essentially descriptive, rather than hypothesis driven. However, we did expect that the narrower ICSD diagnoses would cluster within analogous (but broader) DSM-IV and ICD-10 categories, and that the distribution of diagnoses would be similar to that reported by Coleman et al. (5) using the DCSAD.

## METHODS

The methods of this study have been described in greater detail elsewhere (4) and will be briefly summarized here. A total of 257 patients between the ages of 14 and 89 participated; these included 216 patients with a presenting complaint of insomnia and 41 control patients selected from psychiatric and medical settings without regard to sleep symptoms or problems. All insomnia patients were self- or physician-referred, and were not recruited by advertisement for the study. No other selection criteria were employed. Approximately 50 patients were enrolled from sleep disorders centers at each of five sites (University of Pittsburgh, Montefiore Hospital of the Albert Einstein College of Medicine (Bronx), Pennsylvania State University College of Medicine (Hershey), Henry Ford Hospital (Detroit) and Mayo Clinic (Rochester).

Interviewers were given the proposed DSM-IV and ICD-10 diagnoses and diagnostic criteria for review prior to interviewing subjects. Sleep specialists were also asked to familiarize themselves with ICSD diagnoses and criteria, and to refer back to these whenever necessary. Each patient was interviewed by one sleep specialist and one non-sleep specialist clinician (psychologist, psychiatrist, neurologist), using a nonstructured clinical interview. After the interview, each clinician indicated clinical diagnoses using DSM-IV criteria; sleep specialists (but not nonspecialists) also indicated ICSD diagnoses. Therefore, only specialists' responses will be considered in this report. For each patient, clinicians indicated one "first diagnosis", and, if necessary, one "second diagnosis", one "third diagnosis" and an unlimited number of "rule-out" diagnoses. The first diagnosis will be referred to as the primary diagnosis, and all other diagnoses as secondary diagnoses. In all cases, diagnoses were based on clinical history alone, prior to any polysomnographic evaluations.

The distributions of ICSD, DSM-IV and ICD-10 diagnoses are presented as descriptive data (numbers and percentages of patients) for the aggregate sample, accompanied by ranges across sites.

## RESULTS

Patient demographic data are presented in Table 1. In general, the study group comprised well-educated, middle-aged individuals with stable work histories. Patients differed significantly across sites in race, age, marital status and education. The Mayo and Hershey sites had older, less racially diverse samples relative to other sites.

Table 2 shows the distribution of ICSD diagnoses for the 257 patients. A total of 31 separate diagnoses were used at least once. Interviewers assigned a mean of 3.5 $\pm$ 1.9 diagnoses per case. "Sleep disorder associated with mood disorders" was the most frequent primary diagnosis (32.2% of sample), and "Sleep disorders associated with other psychiatric disorders" (psychosis, alcoholism, anxiety disorders) accounted for an additional 7.8% of cases. The next most frequent primary diagnoses were "Psychophysiological insomnia" (12.5%), "Delayed sleep phase syndrome" (7.0%) and "Inadequate sleep hygiene" (6.2%). When both primary and secondary diagnoses were considered, "Sleep disorder associated with mood disorder" was diagnosed in 53.7% of cases, and "Sleep disorder associated with other psychiatric disorders" in an additional 30.4% of cases. These diagnoses were again followed by "Psychophysiological insomnia" (39.7%) and "Inadequate sleep hygiene" (34.2%). "Obstructive sleep apnea" (24.5%) and "Periodic limb movement



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**TABLE 1.** *Patient demographic information*

| | Entire sample | Range across sites |
|---|---|---|
| Gender (male/female) | 128 (49.8%)/129 (50.2%) | 41.0–56.0%/44.0–59.0% |
| Race[a] | | |
| White | 218 (84.8%) | 71.7–100% |
| Black | 25 (9.7%) | 0–18.9% |
| Other | 14 (5.4%) | 0–13.0% |
| Age[b] | | |
| Mean | 47.9 years | 44.3–57.6 years |
| Range | 14–93 years | |
| Marital status[c] | | |
| Married/partner | 142 (55.2%) | 37.0–70.0% |
| Divorced/separated/widowed | 50 (19.5%) | 10.0–27.8% |
| Never married | 65 (25.3%) | 8.0–36.0% |
| Occupation[d] | | |
| Homemaker | 26 (10.1%) | 5.5–16.0% |
| Manager, administrative, personnel | 49 (19.1%) | 13.0–24.0% |
| Professional | 65 (25.3%) | 18.9–32.0% |
| Sales/clerical | 45 (17.5%) | 8.0–26.0% |
| Laborer, service worker | 52 (20.2%) | 10.0–32.1% |
| Student | 20 (7.8%) | 0.0–18.5% |
| Education[e] | | |
| Graduate university degree | 37 (14.4%) | 7.5–22.0% |
| Undergraduate college degree | 61 (23.7%) | 11.1–34.0% |
| Partial college | 59 (23.0%) | 10.0–34.0% |
| High school graduate | 69 (26.8%) | 12.0–34.0% |
| Partial high school | 31 (12.1%) | 6.0–22.2% |

[a] Site difference $\chi^2 = 29.97$, $p = 0.001$.
[b] Site difference ANOVA $F(4, 242) = 5.73$, $p = 0.0002$.
[c] Site difference $\chi^2 = 21.94$, $p = 0.005$.
[d] Site difference for occupational status $\chi^2 = 40.00$, $p = 0.005$.
[e] Site difference $\chi^2 = 34.48$, $p = 0.005$.

disorder" (21.8%) were also diagnosed frequently, mainly as secondary or rule-out diagnoses. Table 2 also indicates substantial site-related variability in the frequency of specific diagnoses.

By comparison, the most frequent DSM-IV primary diagnoses (Table 3) were "Insomnia related to another mental disorder" (44%) and "Primary insomnia" (20.2%). When both primary and secondary diagnoses were considered, these diagnoses were present in 77% and 48.2% of cases, respectively, followed in frequency by "Secondary sleep disorder related to an Axis III condition" (24.1%), "Breathing-related sleep disorder" (21.4%) and "Substance-induced sleep disorder" (18.7%). Interviewers assigned a mean of 2.4 ± 1.1 diagnoses per case. As with ICSD, the distribution of diagnoses by DSM-IV categories varied considerably from site to site.

ICD-10 diagnoses (Table 4) showed a more limited range. The mean number of assigned diagnoses was 2.0 ± 0.9. "Insomnia due to emotional causes" was diagnosed in 61.9% of cases, "Disorder of initiating and maintaining sleep due to organic causes" in 8.9% of cases, and "Nonorganic disorders of the sleep–wake schedule" in 4.7%. Considering both primary and secondary diagnoses, the same general pattern held, but "Obstructive sleep apnea" and "Other organic sleep disorders" were also diagnosed rather frequently (19.5% and 12.8%, respectively).

A cross-classification of ICSD and DSM-IV diagnoses (Table 5) shows that ICSD diagnoses, for the most part, clustered logically within the broader DSM-IV categories. For example, cases with ICSD diagnoses of "Psychophysiological insomnia" and various "Extrinsic sleep disorders" were diagnosed as "Primary insomnia" within the DSM-IV system. ICSD diagnoses of sleep disorders associated with specific psychiatric disorders were subsumed within the more general DSM-IV category of "Insomnia related to another mental disorder". Diagnoses of "Delayed sleep phase system" were 100% concordant across diagnostic classifications.

The analogous cross-classification for ICSD and ICD-10 (Table 6) shows that one ICD-10 category, "Nonorganic insomnia", subsumed diagnoses from 12 different ICSD categories (61.9% of cases), including diagnoses from intrinsic and extrinsic sleep disorder categories and from psychiatric sleep disorders. "Organic insomnia" in ICD-10 was distributed across 14



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**TABLE 2.** *ICSD diagnoses*

| Diagnosis | Primary diagnosis | | | All assigned diagnoses | | |
|---|---|---|---|---|---|---|
| | n | % of cases | Range across sites (%) | n | % of cases | Range across sites (%) |
| No sleep diagnosis | 16 | 6.2 | 4.0–9.4 | 16 | 6.2 | 4.0–9.4 |
| Psychophysiological insomnia | 32 | 12.5 | 0–26.0 | 102 | 39.7 | 2.0–66.0 |
| Sleep state misperception | 1 | 0.4 | 0–2.0 | 17 | 6.6 | 0–16.0 |
| Idiopathic insomnia | 6 | 2.3 | 0–6.0 | 21 | 8.2 | 0–26.0 |
| Narcolepsy/idiopathic hypersomnia | 3 | 0.8 | 0–2.0 | 3 | 1.2 | 0–4.0 |
| Obstructive sleep apnea syndrome | 12 | 4.7 | 0–14.8 | 63 | 24.5 | 4.0–36.0 |
| Central sleep apnea/alveolar hypoventilation | 2 | 0.8 | 0–2.0 | 33 | 12.8 | 0–20.8 |
| Periodic limb movement disorder | 1 | 0.4 | 0–1.9 | 56 | 21.8 | 0–38.0 |
| Restless legs syndrome | 2 | 0.8 | 0–1.9 | 22 | 8.6 | 0–16.0 |
| Intrinsic sleep disorder, other and NOS | 3 | 1.2 | 0–3.8 | 6 | 2.3 | 0–9.4 |
| Inadequate sleep hygiene | 16 | 6.2 | 0–16.0 | 88 | 34.2 | 2.0–64.0 |
| Adjustment sleep disorder | 6 | 2.3 | 0–8.0 | 12 | 4.7 | 0–20.0 |
| Substance-dependent sleep disorders | 8 | 3.1 | 0–6.0 | 46 | 17.9 | 5.7–30.0 |
| Extrinsic sleep disorder, other and NOS | 3 | 1.2 | 0–4.0 | 21 | 8.2 | 0–20.8 |
| Other circadian rhythm sleep disorders | 5 | 1.9 | 1.9–2.0 | 19 | 7.4 | 4.0–12.0 |
| Delayed sleep phase syndrome | 18 | 7.0 | 0–13.2 | 38 | 14.8 | 4.0–26.4 |
| Arousal-type parasomnias | 2 | 0.8 | 0–3.8 | 9 | 3.5 | 0–13.2 |
| REM sleep parasomnias | 1 | 0.4 | 0–2.0 | 18 | 7.0 | 2.0–24.0 |
| Sleep disorder associated with psychosis | 4 | 1.6 | 0–4.0 | 5 | 1.9 | 0–6.0 |
| Sleep disorder associated with mood disorder | 83 | 32.3 | 22.0–64.0 | 138 | 53.7 | 42.6–68.0 |
| Sleep disorder associated with anxiety disorder | 14 | 5.4 | 2.0–10.0 | 52 | 20.2 | 14.0–32.1 |
| Sleep disorder associated with panic disorder | 2 | 0.8 | 0–2.0 | 12 | 4.7 | 2.0–13.2 |
| Sleep disorder associated with neurological disorder | 4 | 1.6 | 0–3.7 | 14 | 5.4 | 1.9–10.0 |
| Sleep disorder associated with medical disorder | 3 | 1.2 | 0–3.7 | 17 | 6.6 | 1.9–14.0 |
| Other | 11 | 4.3 | 0–12.0 | 39 | 15.2 | 0–36.0 |

different ICSD categories. The ICSD diagnosis of "Delayed sleep phase syndrome" was divided between ICD-10 diagnoses of "Nonorganic disorders of the sleep–wake schedule" and "Delayed sleep phase syndrome". Finally, the cross-classification of DSM-IV and ICD-10 diagnoses (Table 7) shows the expected clustering of DSM-IV "Primary insomnia" and "Insomnia related to psychiatric disorder" with ICD-10 "Nonorganic insomnia". This ICD-10 diagnosis accounted for 69.6% of all cases.

## DISCUSSION

Insomnia related to psychiatric disorders was the most prevalent diagnosis in this group of 257 patients, according to ICSD, DSM-IV and ICD-10 diagnostic

**TABLE 3.** *DSM-IV diagnoses*

| Diagnosis | Primary diagnosis | | | All assigned diagnoses | | |
|---|---|---|---|---|---|---|
| | n | % of cases | Range across sites (%) | n | % of cases | Range across sites (%) |
| No sleep diagnosis | 19 | 7.4 | 3.7–10.0 | 19 | 7.4 | 3.7–10.0 |
| Primary insomnia | 52 | 20.2 | 6.0–30.0 | 124 | 48.2 | 6.0–70.0 |
| Narcolepsy | 2 | 0.8 | 0–2.0 | 2 | 0.8 | 0–2.0 |
| Breathing-related sleep disorder | 14 | 5.4 | 0–16.7 | 55 | 21.4 | 2.0–32.0 |
| Dyssomnia NOS | 7 | 2.7 | 0–7.4 | 34 | 13.2 | 0–28.3 |
| Delayed sleep phase syndrome | 18 | 7.0 | 0–13.2 | 34 | 13.2 | 2.0–24.5 |
| Shift-work sleep disorder | 2 | 0.8 | 0–2.0 | 6 | 2.6 | 0–4.0 |
| Circadian rhythm sleep disorder, unspecified | 3 | 1.2 | 0–2.0 | 7 | 2.7 | 0–8.0 |
| Nightmare disorder | 1 | 0.4 | 0–2.0 | 10 | 3.9 | 0–10.0 |
| Sleep terror disorder | 1 | 0.4 | 0–1.9 | 4 | 1.6 | 0–5.7 |
| Sleepwalking disorder | 1 | 0.4 | 0–1.9 | 3 | 1.2 | 0–3.8 |
| Parasomnia NOS | 2 | 0.8 | 0–2.0 | 9 | 3.5 | 0–10.0 |
| Insomnia related to another mental disorder | 113 | 44.0 | 27.8–82.0 | 198 | 77.0 | 63.0–90.0 |
| Secondary sleep disorder due to an Axis III disorder: insomnia type | 10 | 3.9 | 2.0–7.4 | 62 | 24.1 | 11.1–46.0 |
| Secondary sleep disorder due to an Axis III disorder: hypersomnia type | 1 | 0.4 | 0–2.0 | 4 | 1.6 | 0–4.0 |
| Substance-induced sleep disorder: insomnia type | 9 | 3.5 | 0–8.0 | 48 | 18.7 | 0–40.0 |
| Other | 2 | 0.8 | 0–2.0 | 2 | 0.8 | 0–2.0 |



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**TABLE 4.** *ICD-10 diagnoses*

| Diagnosis | Primary diagnosis | | | All assigned diagnoses | | |
|---|---|---|---|---|---|---|
| | n | % of cases | Range across sites (%) | n | % of cases | Range across sites (%) |
| No sleep diagnosis | 18 | 7.0 | 3.7–9.4 | 18 | 7.0 | 3.7–9.4 |
| Nonorganic insomnia | 159 | 61.9 | 40.7–88.0 | 211 | 82.1 | 66.0–96.0 |
| Nonorganic disorder of the sleep–wake schedule | 12 | 4.7 | 0–13.2 | 25 | 9.7 | 2.0–17.0 |
| Sleepwalking | 1 | 0.4 | 0–1.8 | 3 | 1.2 | 0–3.8 |
| Sleep terrors | 1 | 0.4 | 0–2.0 | 4 | 1.6 | 0–5.6 |
| Nightmares | 1 | 0.4 | 0–1.8 | 8 | 3.1 | 0–6.0 |
| Other nonorganic sleep disorder | 6 | 2.3 | 0–7.4 | 8 | 3.1 | 0–9.3 |
| Nonorganic sleep disorder, unspecified | 1 | 0.4 | 0–2.0 | 4 | 1.6 | 0–2.0 |
| Organic insomnia | 23 | 8.9 | 2.0–14.0 | 86 | 33.5 | 14.0–66.0 |
| Delayed sleep phase syndrome | 10 | 3.9 | 0–7.4 | 23 | 8.9 | 2.0–13.2 |
| Irregular sleep–wake pattern | 2 | 0.8 | 0–2.0 | 5 | 1.9 | 0–4.0 |
| Alveolar hypoventilation syndrome | 2 | 0.8 | 0–1.9 | 10 | 3.9 | 0–7.5 |
| Central sleep apnea | 1 | 0.4 | 0–1.9 | 18 | 7.0 | 0–15.1 |
| Obstructive sleep apnea | 11 | 4.3 | 0–13.0 | 50 | 19.5 | 4.0–28.0 |
| Narcolepsy and cataplexy | 2 | 0.8 | 0–2.0 | 2 | 0.8 | 0–20.0 |
| Other organic sleep disorders | 4 | 1.6 | 0–3.7 | 33 | 12.8 | 0–20.0 |
| Organic sleep disorder, unspecified | 3 | 1.2 | 0–3.7 | 11 | 4.3 | 0–7.4 |

systems. "Psychophysiological insomnia", "Delayed sleep phase syndrome" and "Inadequate sleep hygiene" were also frequent ICSD diagnoses. Interviewers used a larger number of ICSD diagnoses than DSM-IV or ICD-10 diagnoses in their clinical formulations. The more narrowly defined diagnoses of ICSD were subsumed under analogous, but broader, DSM-IV and ICD-10 categories. Wide variations in diagnostic dis-

**TABLE 5.** *Comparison of ICSD and DSM-IV diagnoses*[a]

| | No sleep diagnosis | Primary insomnia | Narcolepsy | Breathing-related sleep disorder | Dyssomnia NOS | Delayed sleep phase | Shift-work sleep disorder | Other circadian sleep disorder | Parasomnia NOS | Insomia/mental disorder | Secondary insomnia (Axis III) | Substance-induced insomnia |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No sleep diagnosis | 16 | | | | | | | | | | | |
| Psychophysiological insomnia | | 31 | | | | | | | | 1 | | |
| Idiopathic insomnia | | 6 | | | | | | | | | | |
| Narcolepsy | | | 2 | | | | | | | | | |
| Obstructive sleep apnea | | | | 12 | | | | | | | | |
| Central sleep apnea | | | | 2 | | | | | | | | |
| Restless legs syndrome | | | | | 1 | | | | | | 1 | |
| Intrinsic sleep disorder NOS | | 1 | | | 2 | | | | | | | |
| Inadequate sleep hygiene | | 12 | | | 2 | | | | | | | 1 |
| Adjustment sleep disorder | | | | | | | | | | 6 | | |
| Hypnotic-dependent sleep disorder | | | | | | | | | | | 1 | 6 |
| Extrinsic sleep disorder NOS | | 1 | | | | | | | | | | 1 |
| Shift-work sleep disorder | | | | | | | 2 | | | | | |
| Irregular sleep-wake schedule | | | | | | | | 2 | | | | |
| Delayed sleep phase syndrome | | | | | | 18 | | | | | | |
| Sleep disorder associated with psychosis | | | | | | | | | | 4 | | |
| Sleep disorder associated with mood disorder | 3 | 1 | | | | | | | | 79 | | |
| Sleep disorder associated with anxiety disorder | | | | | | | | | | 14 | | |
| Sleep disorder associated with panic disorder | | | | | | | | | | 2 | | |
| Sleep disorder associated with neurological disorder | | | | | | | | | 1 | | 3 | |
| Sleep disorder associated with medical disorder | | | | | | | | | | | 3 | |
| Other | | | | | | | | | 1 | 7 | 2 | |

[a] Diagnoses with row or column total ≤1 are not shown.



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**TABLE 6.** *Comparison of ICSD and ICD-10 diagnoses*[a]

| | No sleep diagnosis | Nonorganic insomnia | Nonorganic disorder sleep–wake schedule | Other nonorganic sleep disorder | Organic insomnia | Delayed sleep phase | Irregular sleep–wake schedule | Central apnea/alveolar hypoventilation | Obstructive sleep apnea | Narcolepsy and cataplexy | Other organic sleep disorder | Organic sleep disorder, unspecified |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No sleep diagnosis | 16 | | | | | | | | | | | |
| Psychophysiological insomnia | | 29 | | | 1 | 2 | | | | | | |
| Idiopathic insomnia | | 5 | | | 1 | | | | | | | |
| Narcolepsy | | | | | | | | | | 2 | | |
| Obstructive sleep apnea | | | | | | | | | 12 | | | |
| Central sleep apnea | | | | | | | | 2 | | | | |
| Restless legs syndrome | | | | | 2 | | | | | | | |
| Intrinsic sleep disorder NOS | | | | | 1 | | | | | | 1 | 1 |
| Inadequate sleep hygiene | | 9 | | 2 | 4 | | | | | | | |
| Adjustment sleep disorder | | 6 | | | | | | | | | | |
| Hypnotic-dependent sleep disorder | | 1 | | 1 | 3 | | | | | | 1 | 1 |
| Extrinsic sleep disorder NOS | | 1 | | | 1 | | | | | | | |
| Shift-work sleep disorder | | | 1 | | | | 1 | | | | | |
| Irregular sleep–wake schedule | | | 1 | | | | 1 | | | | | |
| Delayed sleep phase syndrome | | 1 | 9 | | | 8 | | | | | | |
| Sleep disorder associated with psychosis | | 4 | | | | | | | | | | |
| Sleep disorder associated with mood disorder | 2 | 81 | | | | | | | | | | |
| Sleep disorder associated with anxiety disorder | | 14 | | | | | | | | | | |
| Sleep disorder associated with panic disorder | | 2 | | | | | | | | | | |
| Sleep disorder associated with neurological disorder | | | | | 3 | | | | | | 1 | |
| Sleep disorder associated with medical disorder | | | | | 3 | | | | | | | |
| Other | | 6 | | | 3 | | | | | | | 1 |

[a] Diagnoses with row or column total ≤1 are not shown.

tributions were seen across sites. Finally, our patients included equal numbers of men and women who were highly educated; therefore, generalizations to the general population of insomnia sufferers should be made with caution.

Both the current study and Coleman et al.'s study of 1,214 patients at 11 sleep disorders centers (5) found that insomnia related to psychiatric disorders was the most common diagnosis, followed by psychophysiological insomnia. The frequency of these diagnoses was over twice as great as that reported in Zorick et al.'s study of 84 clinic insomnia patients (6). We also found a lower frequency of substance-related insomnia and periodic limb movement disorder/restless legs syndrome than either of these studies. However, it is important to note that Coleman and Zorick collected diagnoses after polysomnography, whereas our diagnoses were assigned on purely clinical grounds after one interview. This may explain our low frequency of "Periodic limb movement disorder" as a primary diagnosis (1.2%) and its high frequency as a secondary or rule-out diagnosis (30.4%).

There are other possible explanations for the higher frequency of these diagnoses after polysomnography in the Coleman and Zorick studies. Methodologically, the Coleman study did not include non-sleep patient controls, and the Zorick study did not directly report the amount of periodic limb movements or apnea in patient and control groups. Furthermore, some investigators question the validity of diagnoses attributed to polysomnographic findings such as periodic limb movements or apnea (7–10). The presence of apnea or periodic limb movements to a degree found within the range for a normal population could be interpreted as representing a clinical diagnosis of either condition in uncontrolled patient samples and could confuse causality with correlation (9).

Finally, the Coleman and Zorick studies may have diagnosed fewer cases of psychiatric insomnia because not all subjects received a standard psychiatric eval-



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**TABLE 7.** *Comparison of DSM-IV and ICD-10 diagnoses*[a]

| | No sleep diagnosis | Primary insomnia | Narcolepsy | Breathing-related sleep disorder | Dyssomnia NOS | Delayed sleep phase syndrome | Shift-work sleep disorder | Circadian rhythm sleep disorder | Parasomnia NOS | Insomnia/mental disorder | Secondary insomnia (Axis III) | Substance-induced insomnia |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No sleep diagnosis | 18 | | | | | | | | | | | |
| Nonorganic insomnia | 1 | 44 | | | | 1 | | | | 112 | | 21 |
| Nonorganic disorders of the sleep–wake schedule | | | | | | 9 | 1 | 2 | | | | |
| Other nonorganic sleep disorder | | | | | 4 | | | | 1 | | | 1 |
| Organic insomnia | | 4 | | | 2 | | | | | 1 | 9 | 6 |
| Delayed sleep phase syndrome | | 2 | | | | 8 | | | | | | |
| Irregular sleep–wake pattern | | | | | | | 1 | 1 | | | | |
| Alveolar/hypoventilation syndrome | | | | 2 | | | | | | | | |
| Obstructive sleep apnea | | | | 11 | | | | | | | | |
| Narcolepsy and cataplexy | | | 2 | | | | | | | | | |
| Other organic sleep disorder | | | | | 2 | | | | 1 | | 1 | |
| Organic sleep disorder, unspecified | | 1 | | | 1 | | | | | | | 1 |

[a] Diagnoses with row or column total ≤1 are not shown.

uation, including psychometric testing. Here again, controversy remains. Although some investigators have emphasized the importance of MMPI results in insomnia populations (11), others caution against overgeneralization of MMPI findings (6).

Differences between ICSD and DSM-IV or ICD-10 diagnoses were apparently of two types. The first type is more semantic than conceptual and results from ICSD's specification of individual medical and psychiatric disorders, as opposed to broader categories in DSM-IV and ICD-10.

The second type of difference between ICSD and DSM-IV or ICD-10 is more substantive and consists of the greater subtyping of nonpsychiatric, nonmedical forms of insomnia in ICSD. For instance, patients diagnosed with DSM-IV "Primary insomnia" fell into three major ICSD categories, "Psychophysiological insomnia", "Inadequate sleep hygiene" and "Idiopathic insomnia". This type of difference between the systems ultimately relates to the conceptualization and presumed etiology of insomnia problems. "Primary insomnia" in DSM-IV is essentially atheoretical with regard to causation; "Psychophysiological insomnia" in ICSD invokes conditioning and physiological factors; "Inadequate sleep hygiene" attributes causation to voluntary behaviors; and "Idiopathic insomnia" assumes a yet unidentified genetic or biological component. Whether the broader DSM-IV and ICD-10 categories or the more narrow ICSD categories have greater validity remains to be determined. Indicators of validity may include differences in longitudinal course, treatment response, familial patterns and polysomnographic measures. Some of the authors (Reynolds, Buysse and Kupfer in reference 12) have argued that such indicators of validity have not yet been demonstrated for many subtypes of insomnia, but further empirical studies may elucidate this issue. As part of the current field trial, we collected data regarding treatment recommendations. Preliminary analyses show that different sleep diagnoses lead to different treatment recommendations even among the narrowly defined ICSD insomnia categories (13).

Finally, we found very substantial site-related variability in the pattern of diagnosis using each of the diagnostic systems (seen in the range of diagnostic frequency across sites). There were clear differences in the total number of diagnoses assigned, as well as in the types of diagnoses assigned. Differences in patient populations substantiated by significant age differences across sites, could account for some of this discrepancy. Alternatively, differences in diagnosis could also reflect differences in the emphasis accorded to specific clinical features. To distinguish between these possibilities, we conducted a videotape study in which the same patients were diagnosed by clinicians at several different sites. Preliminary analyses indicate substantial site-related differences in diagnosis, suggesting that conceptual differences among interviewers rather than differences in patient populations account for most of the diagnostic variability (14). Having developed several



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recent nosologies for sleep disorders (including ICSD, DSM-IV and ICD-10), the sleep disorders community must continue to address their reliability and validity. Structured diagnostic interviews, such as that described by Schramm and colleagues (15), represent an initial step in this direction.

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