

Economic Burden of Patients With Idiopathic Hypersomnia and Narcolepsy: A US Claims-Based Analysis

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Introduction

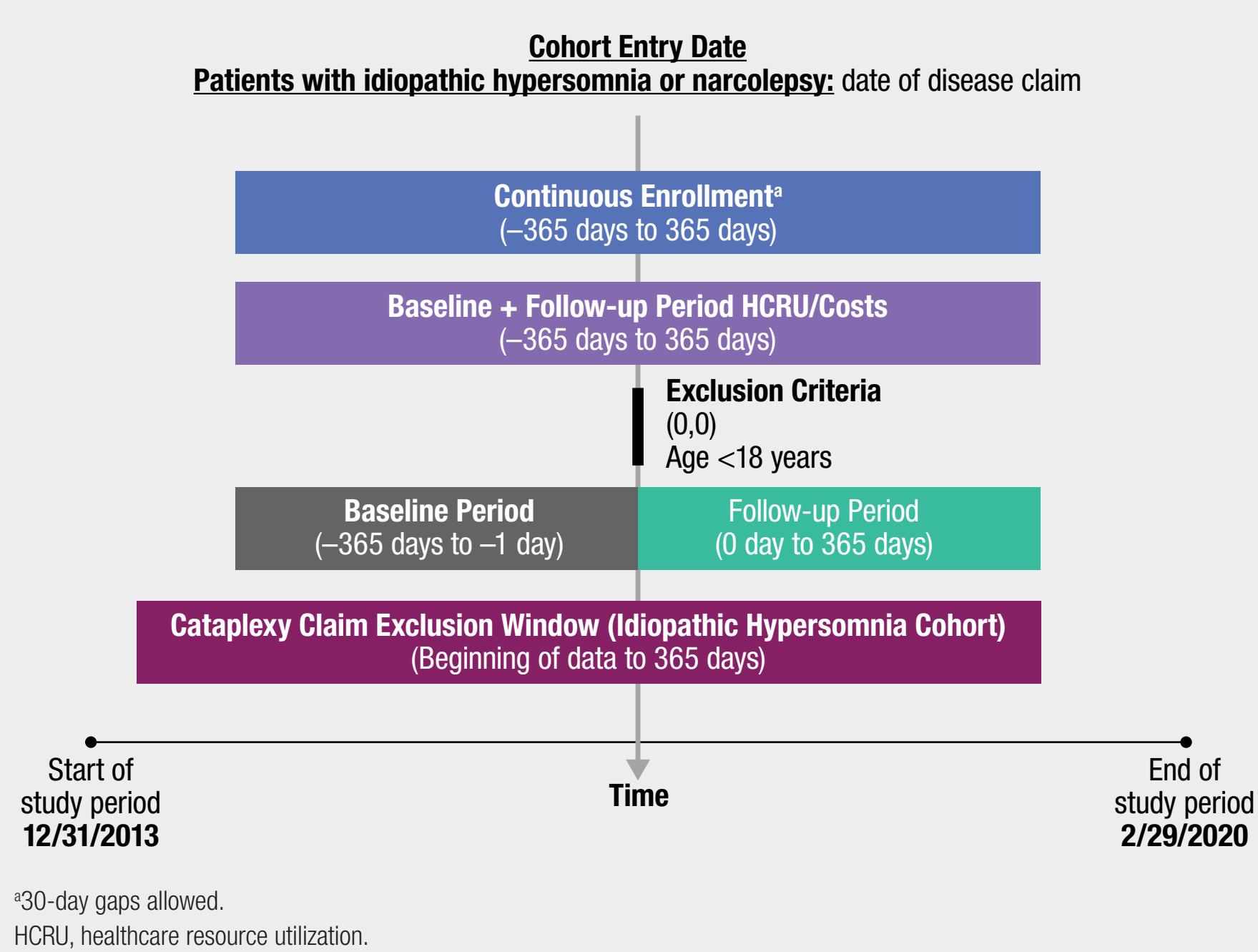
- Idiopathic hypersomnia and narcolepsy are rare neurologic sleep disorders characterized primarily by profound excessive daytime sleepiness¹⁻³
- The characteristics of these disorders are similar but distinct, with patients with idiopathic hypersomnia more commonly experiencing sleep inertia, unrefreshing naps, and long sleep duration⁴
- Literature reporting the economic burden of central disorders of hypersomnolence is limited⁴⁻⁶

Objective

- To describe the clinical characteristics, healthcare resource utilization (HCRU), and medical costs for patients with idiopathic hypersomnia and patients with narcolepsy

Methods

Figure 1. Study Design



- Merative MarketScan US administrative claims were analyzed (study period, 12/31/2013–2/29/2020; index period, 12/31/2014–3/1/2019)
- Eligible patients were ≥18 years of age and continuously enrolled for 365 days before and after cohort entry (≤30-day gaps allowed)
- Patients were excluded from the idiopathic hypersomnia cohort if they received a cataplexy diagnosis at any time before cohort entry or during the follow-up period
- Patients with idiopathic hypersomnia and patients with narcolepsy entered their respective cohort on receipt of their earliest medical claim with a diagnosis for idiopathic hypersomnia (*International Classification of Diseases, Ninth Revision, Clinical Modification* [ICD-9-CM], 327.11, 327.12; *Tenth Revision, Clinical Modification* [ICD-10-CM], G47.11, G47.12) or narcolepsy (ICD-9-CM, 347.0, 347.00, 347.01, 347.10, 347.11; ICD-10-CM, G47.41, G47.411, G47.419, G47.42, G47.421, G47.429), respectively, in any position among those who met all other inclusion and exclusion criteria within the 365 days before or after cohort entry⁷⁻⁹
- Comorbid clinical characteristics, HCRU, and all-cause total and outpatient medical costs were identified and described for both cohorts, assessed over a 2-year period (365 days before and after cohort entry)
- Nonclinical characteristics (eg, age, sex) were assessed upon cohort entry date
- Comorbid clinical characteristics were summarized as the percentage of patients with at least one claim, and the categories with the highest percentages were reported
- HCRU and medical costs were summarized as mean (SD) and median [IQR] and reported as per patient per year (PPPY)

Results

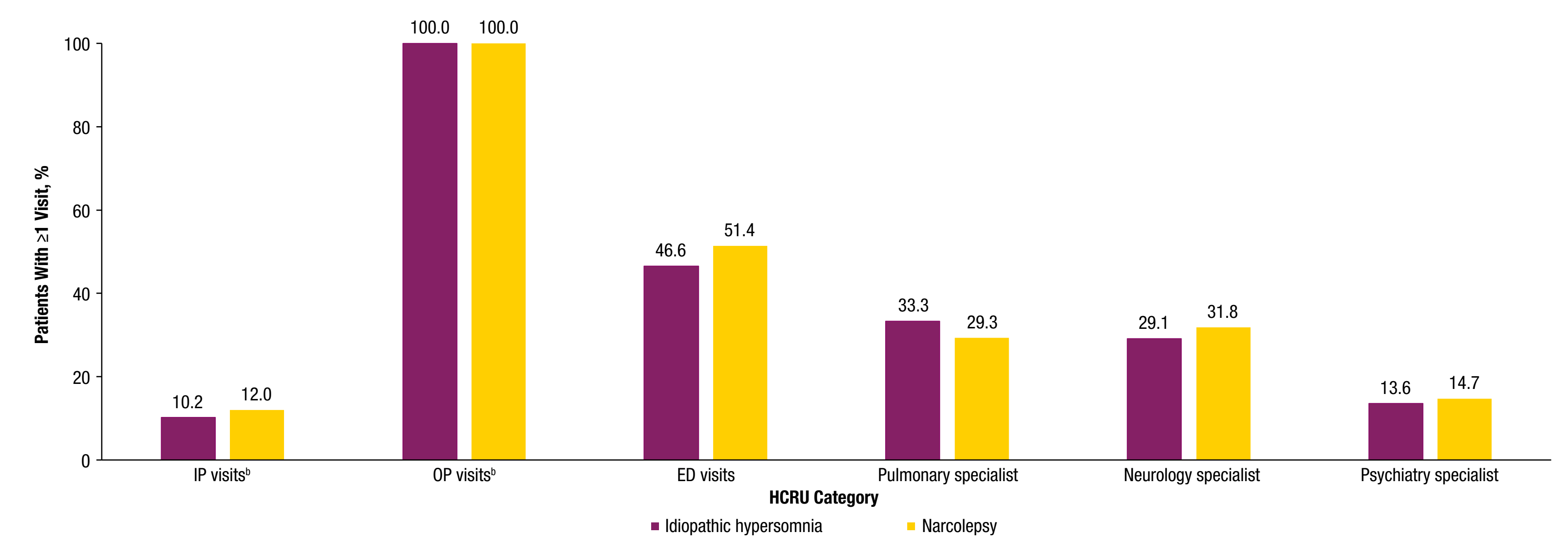
Table 1. Demographic Characteristics of Patients With Idiopathic Hypersomnia and Narcolepsy at Cohort Entry

	Patients With Idiopathic Hypersomnia	Patients With Narcolepsy
Patients, n	11,426	31,214
Age, years		
Mean (SD)	44.3 (14.0)	43.0 (15.0)
Median [IQR]	45.0 [34.0, 55.0]	43.0 [31.0, 54.0]
Sex, n (%)		
Male	3997 (35.0)	10,957 (35.1)
Female	7425 (65.0)	20,246 (64.9)
Unknown	4 (0.0)	11 (0.0)
US geographic region, n (%)		
Northeast	1076 (9.4)	2991 (9.6)
North Central	2353 (20.6)	6706 (21.5)
South	4702 (41.2)	11,713 (37.5)
West	943 (8.3)	2311 (7.4)
Unknown/missing	2352 (20.6)	7493 (24.0)
Insurance type, n (%)		
Commercial	8566 (75.0)	22,058 (70.7)
Medicare	528 (4.6)	1695 (5.4)
Medicaid	2327 (20.4)	7448 (23.9)
Commercial and Medicare	5 (0.0)	13 (0.0)

IQR, interquartile range; SD, standard deviation.

- In total, 11,426 patients with idiopathic hypersomnia and 31,214 patients with narcolepsy were included
- Mean age was 44.3 years for patients with idiopathic hypersomnia and 43.0 years for patients with narcolepsy

Figure 2. All-Cause^a Healthcare Resource Utilization for Patients With Idiopathic Hypersomnia and Narcolepsy



^aAll-cause outcomes were analyzed using all available claims for eligible patients.

^aAll patients were required (per an inclusion criterion) to have ≥1 IP or OP claim.
ED, emergency department; HCRU, healthcare resource utilization; IP, inpatient; OP, outpatient.

- About half of the patients in both cohorts had ≥1 emergency department visit
- Pulmonary specialist was the most common provider type for patients with idiopathic hypersomnia, and neurology specialist was the most common provider type for patients with narcolepsy

Table 2. Mean All-Cause^a Healthcare Resource Utilization for Patients With Idiopathic Hypersomnia and Narcolepsy

	Patients With Idiopathic Hypersomnia	Patients With Narcolepsy
Mean (SD) HCRU, PPPY		
IP	0.07 (0.22)	0.08 (0.26)
OP	28.22 (40.13)	27.43 (40.62)
ED	0.83 (2.07)	0.99 (2.27)
Pulmonology specialist	0.63 (1.28)	0.58 (1.31)
Neurology specialist	0.61 (1.43)	0.72 (1.64)
Psychiatry specialist	0.68 (4.20)	0.69 (3.58)

^aAll-cause outcomes were analyzed using all available claims for eligible patients.

ED, emergency department; HCRU, healthcare resource utilization; IP, inpatient; OP, outpatient; PPPY, per patient per year; SD, standard deviation.

- Patients with idiopathic hypersomnia and patients with narcolepsy have similar mean all-cause HCRU, PPPY, across care settings and provider types

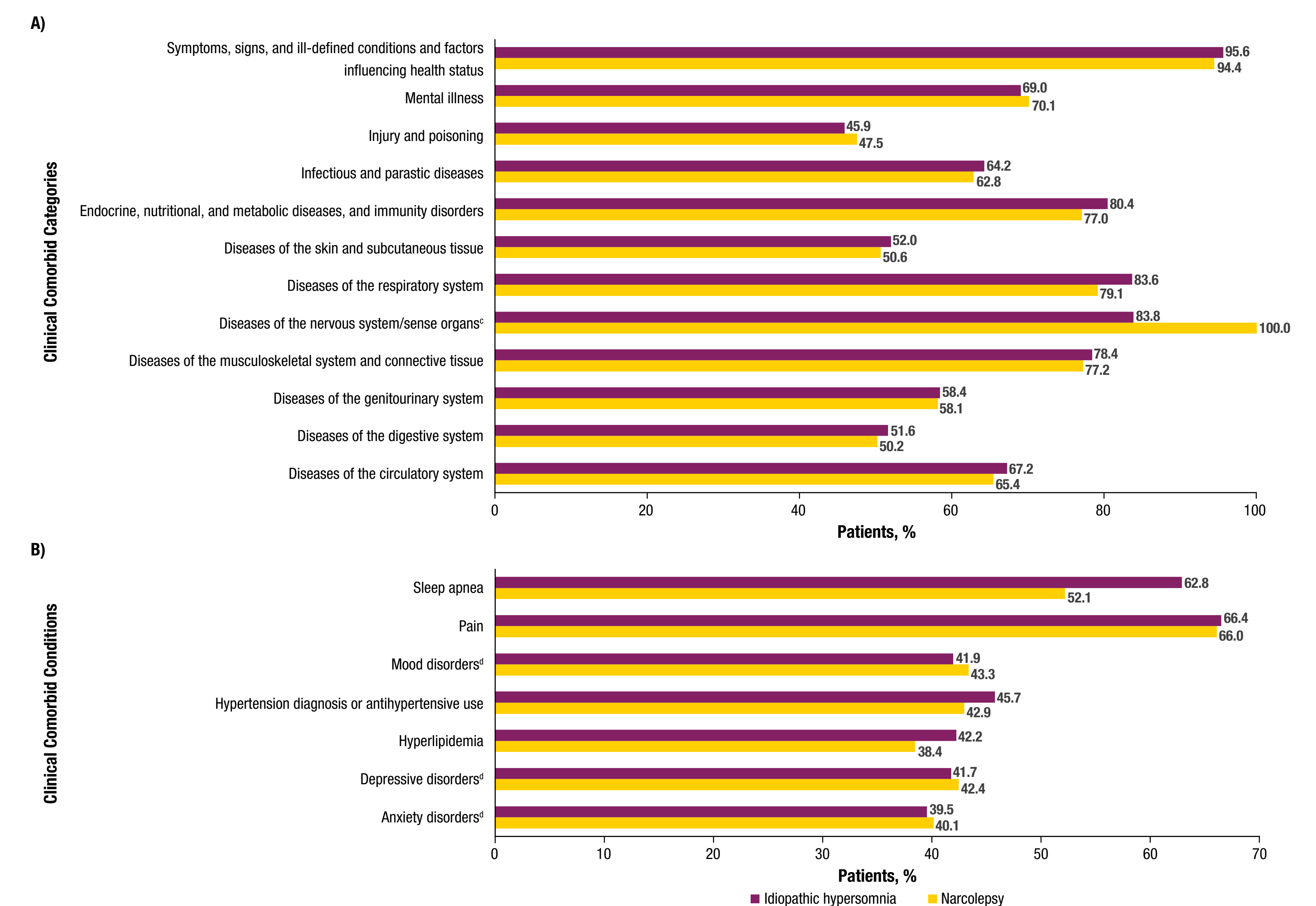
Table 3. Median All-Cause^a Medical Costs for Patients With Idiopathic Hypersomnia and Narcolepsy

Median [IQR] Medical Costs, PPPY, US\$	Patients With Idiopathic Hypersomnia	Patients With Narcolepsy
Total	4856 [2042, 11,379]	4518 [1680, 11,403]
OP	4005 [1790, 8410]	3484 [1364, 7978]

^aAll-cause outcomes were analyzed using all available claims for eligible patients.
IQR, interquartile range; OP, outpatient; PPPY, per patient per year.

- Patients with idiopathic hypersomnia and patients with narcolepsy incur similar median all-cause total costs (\$4856 PPPY and \$4518 PPPY, respectively) and similar median all-cause outpatient costs (\$4005 PPPY and \$3484 PPPY, respectively)

Figure 3. Most Common (A) Broad Clinical Comorbid Categories^a and (B) Clinical Comorbid Conditions in Patients With Idiopathic Hypersomnia and Patients With Narcolepsy^b



^aComorbid clinical categories were identified using Clinical Classifications Software that aggregates *International Classification of Diseases, Tenth Revision, Clinical Modification/Procedure Coding System* (ICD-10-CM/PCS) codes into clinically meaningful categories.¹⁰ The first undefined category includes a range of conditions, including but not limited to syncope, fever of unknown origin, lymphadenitis, gangrene, shock, nausea and vomiting, and malaise and fatigue.

^bComorbid conditions were identified using Clinical Classifications Software, ICD-9-CM (*International Classification of Diseases, Ninth Revision, Clinical Modification*) codes, ICD-10-CM codes, and prescription claims (ie, pain).

^cNarcolepsy falls under the criteria for diseases of the nervous system/sense organs, hence 100% prevalence for this category.

^dMood disorders is a subgroup of the Clinical Classifications Software category for mental illness; therefore, there may be some overlap in reported percentages for depressive disorders and anxiety disorders.

- The most common broad comorbid categories reported for patients with idiopathic hypersomnia and narcolepsy were diseases of the nervous system/sense organs; diseases of the respiratory system; endocrine, nutritional, and metabolic diseases, and immunity disorders; diseases of the musculoskeletal system and connective tissue; mental illness; diseases of the circulatory system; infectious diseases and parasites; diseases of the genitourinary system; diseases of the skin and subcutaneous tissue; and diseases of the digestive system, which were seen in over 50% of patients
- The most common comorbid conditions in patients with idiopathic hypersomnia and narcolepsy were pain (66.4%, 66.0%) and sleep apnea (62.8%, 52.1%)
- Mood disorders, depressive disorders, and hypertension diagnosis or antihypertensive use were also seen in over 40% of patients

Conclusions

- Patients with idiopathic hypersomnia and patients with narcolepsy experience a range of comorbid conditions
- In patients with idiopathic hypersomnia or narcolepsy, the additional clinical burden of comorbid conditions may increase these patients' economic burden as well
- Therapies with proven clinical benefit for idiopathic hypersomnia or narcolepsy may be used to treat these conditions and mitigate their economic burden

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Disclosures: R Saad, P Lillaney, and D Profant are former full-time employees of Jazz Pharmaceuticals who, in the course of this employment, received stock options exercisable for, and other stock awards of, ordinary shares of Jazz Pharmaceuticals, plc. DS Fuller, E Poole, M Whalen, W Macfadden, and W Ni are full-time employees of Jazz Pharmaceuticals who, in the course of this employment, have received stock options exercisable for, and other stock awards of, ordinary shares of Jazz Pharmaceuticals, plc. T Alvord, P Prince, and S Desai are full-time employees of Aetion, Inc. and hold stock options or equity in Aetion. J Black is a part-time employee of Jazz Pharmaceuticals and shareholder of Jazz Pharmaceuticals, plc.



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