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A Retrospective Cohort Analysis of Mobility Impairments and Disability in Complex Regional Pain Syndrome Type 1

Background

- Complex regional pain syndrome type 1 (CRPS-1) is associated with significant impairments in functioning and health-related quality of life.
- CRPS-1 results from an injury without an identifiable nerve lesion, and associated pain and physical impairment can begin years before and persist years after diagnosis.¹
- Treatment options are limited with no FDA-approved pharmacologic treatments and current management focused on spinal cord and DRG stimulation, physical therapy and pain control.^{2,3}
- While CRPS-1 is not in the Social Security Administration Blue Book of impairments qualifying for disability, it was added as a Medically Determinable Impairment (MDI) in 2024.⁴

Objective

- Assess diagnoses of mobility/functional impairment and transition to presumptive Social Security Disability Insurance (SSDI) among patients after incident CRPS-1 diagnosis

Methods

- We conducted a retrospective cohort analysis using Komodo Health's primarily claims-derived Healthcare Map®, a longitudinal, nationally representative health service utilization database with >330 million de-identified, insured US-patients.
- Incident CRPS-1 patients (ICD10 G90.5x) diagnosed between 01/01/17 and 12/31/24 were identified.
- Patients required to have ≥12 months of data with no CRPS-1 diagnosis and:
 - >1 inpatient and >1 outpatient claims with a CRPS-1 diagnosis; or
 - >2 outpatient claims with a CRPS-1 diagnosis >30 days apart; or
 - >2 inpatient stays each with a CRPS-1 diagnosis; or
 - An inpatient stay with a CRPS-1 diagnosis that lasted >7 days; or ended in death
- Patients were excluded if:
 - First CRPS-1 diagnosis appeared outside of their enrollment period;
 - Patients had ≥2 claims with a diagnosis of causalgia (i.e., CRPS-2, ICD10 G56.4x or G57.7x) in the year after initial CRPS-1 diagnosis; or
 - There were open claims
- The index date was defined as the first CRPS-1 diagnosis date in the observation period following the requisite 12 months without a diagnosis. Month 0 is before CRPS-1 diagnosis.
- Two reviewers adjudicated ICD10 codes in the 18 months after CRPS-1 diagnosis for those indicating impaired function/mobility/disability (Table 1).
- We calculated prevalence of individual impairment codes, and cumulative incidence of patients with any impaired mobility/function/disability using a competing risk model controlling for insurance disenrollment/end of study.
- We calculated 12-month cumulative incidence of presumptive SSDI (competing risk model), defined as patients <65 years old transitioning to Medicare (excluding those with ESRD and ALS, who automatically qualify)⁵, compared to US population statistics.⁶
- This analysis is devoid of identifiable patient information and is exempt from IRB review requirements.

Results

- 189,483 patients met incident CRPS-1 criteria (Figure 1)
- Patients were mostly female and in their early 50s (Table 1)
 - Insurance: 47% commercial, 37% Medicare, 17% Medicaid
 - Initial CRPS-1 Diagnosis: 47% upper limb, 23% lower limb
- Of >36,000 ICD10 codes assigned in the 18 months after CRPS-1 diagnosis
 - 21 were associated with impaired mobility/function and disability
 - The most common indicated impaired walking and gait and need for continuous supervision (Table 2)
- Patients with impairment/disability more than doubled over 18 months (16.4% pre-diagnosis vs 37.0% at month 18; Figure 2).
- In the year after diagnosis, the percentage of patients with presumptive SSDI more than doubled from 1.3% to 3.2%, or 1126 to 3198 per 100,000 (Figure 3).

Figure 1. Cohort selection

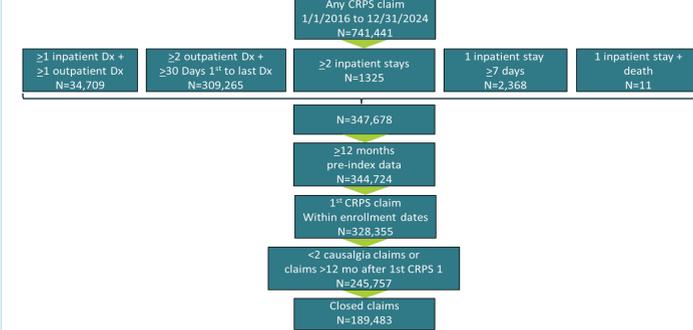


Table 1. Cohort characteristics

Demographics	Frequency Count	Percent
Sex		
Male	56,677	30
Female	130,410	69
Unknown/Missing	2,396	1
Age, mean (SD)	52 (16)	
<50 years	74,222	39
>50 years	114,905	61
Unknown/Missing	356	<1
Insurance		
Commercial	88,048	47
Medicare	69,551	37
Medicaid	31,921	17
Unknown/missing	2	<1
U.S. Geographic Region		
Northeast	42,054	22
South	68,421	36
Midwest	43,007	23
West	35,843	19
US territory	120	<1
Missing	38	<1
Initial CRPS 1 Diagnosis		
Lower	89,303	47
Upper	43,228	23
Other specified	9564	5
Multisite	248	<1
Unspecified	47,140	25

Figure 2. Cumulative Incidence of Mobility/Functional Impairment or Disability (Competing Risk Model Controlling for Insurance Disenrollment/End-of-Study Period)*

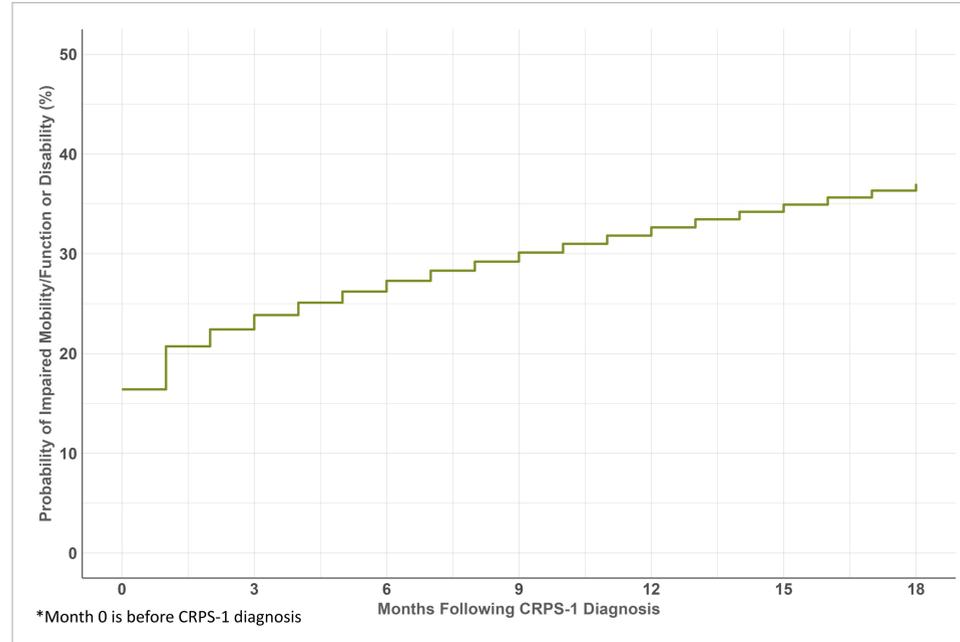


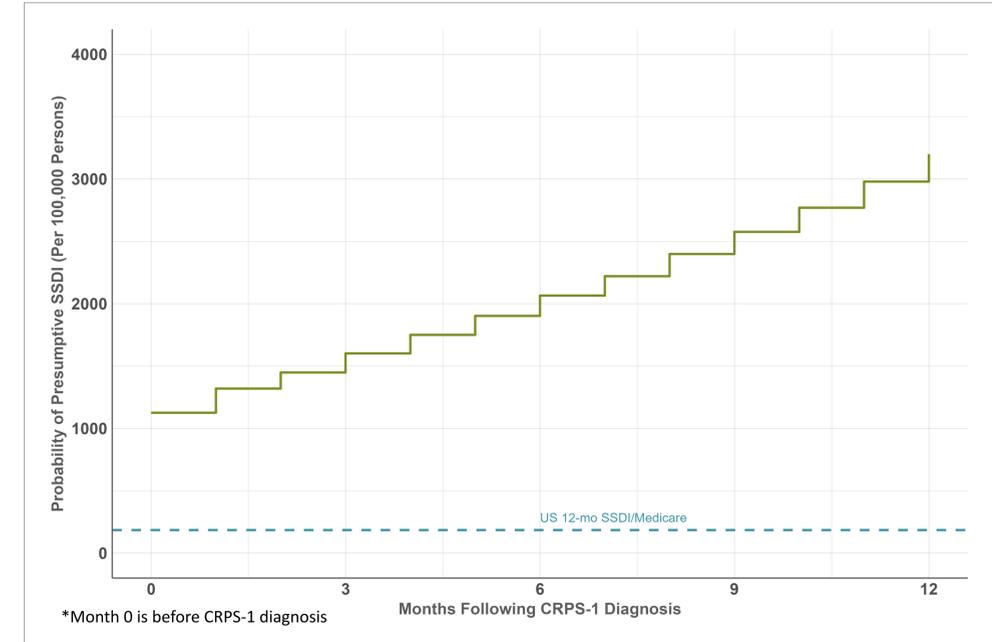
Table 2. Impaired function, mobility and disability ICD10 codes (>5%)

Impaired function/mobility/disability ICD10 codes	Frequency Count	Percent
R26.2 Difficulty in walking, not elsewhere classified	41,634	22
R26.89 Other abnormalities of gait and mobility	36,694	19
Z74.3 Need for continuous supervision	27,739	14
R26.9 Unspecified abnormalities of gait and mobility	27,018	14
R26.81 Unsteadiness on feet	17,675	9
Z74.09 Other reduced mobility	12,293	6

Discussion

- This is the first large-scale, nationally representative study of mobility impairments/disability in patients with CRPS-1.
- Consistent with previous epidemiologic studies, CRPS-1 was most common in women >50 years of age.
- CRPS-1 was twice as common in lower versus upper limbs.
- Impaired function/mobility was dominated by problems with walking/gait and more than doubled in the year after diagnosis; a significant number of patients required continuous supervision.
- Presumptive SSDI in the 18-months post-diagnosis (1126 to 3198 per 100,000) was meaningfully higher than the 185 per 100,000 in the general US population.⁶
- Patients on SSDI make up a disproportionate share of Medicare costs: \$21,954 per capita versus \$15,992 Medicare overall, or 37% higher.⁵
- The strength of the data are that they characterize the medical treatments patients actually receive in the US.

Figure 3. Cumulative Incidence of Presumptive SSDI per 100,000 persons (Competing Risk Model Controlling for Insurance Disenrollment/End-of-Study Period)*



Limitations

- Claims databases represent the insured US population, 92% during this time-period.
- These data represent only patients diagnosed with CRPS-1.
- Though adjudicated, claims data can be incomplete and miscoding can happen.
- It should be noted that there is a significant lag from SSDI evaluation and application to approval, often >12 months. As such, most of the evaluations/applications would have happened in the year before initial CRPS-1 diagnosis, consistent with the known delay from symptom onset to CRPS-1 diagnosis and before CRPS-1 was included as an MDI.

Key Takeaways

- Presumptive SSDI was meaningfully higher in CRPS-1 patients than in the general US population and is a known driver of Medicare cost.
- More than one-third of patients with CRPS-1 had claims related to impaired mobility, including need for continuous supervision.
- These findings highlight the burden to patients and disability insurers and the need for earlier diagnosis and approval of effective treatments for CRPS-1.