

Medicare Patients with Hip and Knee Arthritis Experience Diminished Physical and Emotional Health Functioning Across Two Decades: A Matched Cohort Analysis

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INTRODUCTION: Osteoarthritis (OA) is a major cause of disability in older adults and the second most expensive condition among hospitalized Medicare patients, representing approximately \$11 billion in annual health expenditures. However, little is known about trends in patient-reported outcomes (PROs) for OA patients on Medicare. Here, we compare population-level changes in PROs among Medicare OA patients between 1998 and 2020.

METHODS: The Medicare Health Outcomes Survey (HOS) Database was queried for all patients who reported a diagnosis of hip or knee arthritis in the first (1998) and latest (2020) defined cohorts. The cohorts were successfully propensity score matched for age, gender, race, education status, diabetes, hypertension, congestive heart failure, chronic obstructive pulmonary disease, and smoking status. Patients received various treatments, including non-operative and operative modalities. Chi-squared analysis was used to compare 18 components of the Veterans RAND 12 Item Health Survey (VR-12) and activities of daily living (ADL) between cohorts.

RESULTS: Each matched cohort included 22,001 patients. The 2020 cohort reported lower scores than the 1998 cohort on each component of the VR-12, most notably physical and emotional health on activity level. Compared to the 1998 cohort, the 2020 cohort more frequently reported reduced daily activity (23.3% increase, $p < 0.05$) and more limitations in activity performance due to physical health (26.3% increase, $p < 0.05$) (Table 1). Patients in the 2020 cohort more frequently reported a reduced ability to bring daily activities to completion (15.0% increase, $p < 0.05$) and interference in social activities due to emotional health (17.1% increase, $p < 0.05$) (Table 2). Capacity to perform activities of daily living (ADLs), including bathing, dressing, eating, getting in and out of chairs, walking, using the toilet, was significantly diminished in the 2020 cohort relative to the 1998 cohort ($p < 0.05$ for all) (Table 3).

DISCUSSION AND CONCLUSION: Despite over two decades of advancement in management of hip and knee osteoarthritis, Medicare patients with OA reported diminished physical and emotional health functioning and capacity for ADLs in 2020 relative to 1998. This population is a significant and growing cost driver for the US healthcare system – both directly through medical care and indirectly through lost productive life years and an increased caregiver burden. Our results highlight the need to improve cost-effectiveness in management of OA patients and improve delivery of operative and non-operative care to a disabled population.

Physical Health Measures	Percentages by Cohort		p-value
	1998 Cohort	2020 Cohort	
General Health			< 0.001
Excellent	587 (2.7%)	233 (1.1%)	
Very good	3801 (17.3%)	2244 (11.0%)	
Good	8856 (40.3%)	7842 (35.6%)	
Fair	1798 (8.2%)	2835 (12.9%)	
Poor	1888 (8.6%)	3077 (13.1%)	
Moderate Activities			< 0.001
Limited a lot	6419 (29.2%)	8779 (39.9%)	
Limited a little	5663 (25.8%)	8892 (40.4%)	
Not limited	6576 (29.9%)	4130 (19.7%)	
Stairs			< 0.001
Limited a lot	9566 (43.5%)	11844 (53.8%)	
Limited a little	7913 (35.9%)	7513 (34.1%)	
Not limited	4527 (20.6%)	2652 (12.0%)	
Amount Limited by Physical Health			< 0.001
Yes	13744 (62.5%)	18869 (85.8%)	
No	8257 (37.5%)	3132 (14.2%)	
Activity Type Limited by Physical Health			< 0.001
Yes	13370 (60.8%)	19161 (87.9%)	
No	8623 (39.2%)	2840 (12.1%)	
Pain Interfering with Work			< 0.001
Not at all	4266 (19.4%)	1988 (9.0%)	
A little bit	5243 (23.8%)	4941 (22.5%)	
Moderately	6176 (28.0%)	5051 (22.9%)	
Quite a bit	5005 (22.7%)	4814 (22.0%)	
Extremely	1317 (6.0%)	2989 (13.6%)	

Mental Health Measures	Percentages by Cohort		p-value
	1998 Cohort	2020 Cohort	
Amount Limited by Emotional Health			< 0.001
Yes	8407 (38.2%)	11709 (53.2%)	
No	13594 (61.8%)	10292 (46.8%)	
Carefulness Limited by Emotional Health			< 0.001
Yes	6297 (28.6%)	10067 (45.8%)	
No	15703 (71.4%)	11934 (54.2%)	
Calm and Peaceful			< 0.001
All the time	2001 (9.1%)	2023 (9.2%)	
Most of the time	3573 (16.1%)	7352 (33.1%)	
Good bit of the time	5905 (26.5%)	4781 (20.2%)	
Some of the time	6316 (28.3%)	5715 (25.2%)	
A little of the time	2056 (9.2%)	2816 (12.8%)	
None of the time	1945 (8.8%)	814 (3.6%)	
Lets of Energy			< 0.001
All the time	602 (2.7%)	443 (2.0%)	
Most of the time	3537 (16.1%)	3532 (15.7%)	
Good bit of the time	5805 (26.4%)	5918 (26.5%)	
Some of the time	6309 (28.6%)	7117 (32.3%)	
A little of the time	2412 (11.0%)	2824 (12.8%)	
None of the time	3375 (15.4%)	3549 (15.2%)	
Downhearted and Blue			< 0.001
All the time	408 (1.9%)	669 (3.0%)	
Most of the time	821 (3.7%)	1251 (5.6%)	
Good bit of the time	1226 (5.6%)	1875 (8.5%)	
Some of the time	2148 (9.8%)	2930 (13.3%)	
A little of the time	2875 (13.1%)	3605 (16.4%)	
None of the time	14523 (65.9%)	5061 (22.8%)	
Social Interference by Health			< 0.001
All the time	980 (4.5%)	2222 (10.1%)	
Most of the time	2323 (10.6%)	3444 (15.7%)	
Some of the time	5036 (22.9%)	5002 (22.5%)	
A little of the time	4180 (19.0%)	5005 (22.5%)	
None of the time	9483 (43.1%)	6938 (31.4%)	

Activities of Daily Living (ADL)	Percentages by Cohort		p-value
	1998 Cohort	2020 Cohort	
Bathing			< 0.001
Can't do	555 (2.5%)	1191 (5.4%)	
Yes with difficulty	4028 (18.3%)	5557 (25.3%)	
No difficulty	17418 (79.2%)	15251 (69.3%)	
Dressing			< 0.001
Can't do	393 (1.8%)	701 (3.2%)	
Yes with difficulty	3586 (16.3%)	4688 (21.2%)	
No difficulty	18629 (81.9%)	16383 (75.4%)	
Eating			< 0.001
Can't do	248 (1.1%)	229 (1.0%)	
Yes with difficulty	1374 (6.2%)	1415 (6.5%)	
No difficulty	20379 (92.6%)	20357 (92.5%)	
Chairs			< 0.001
Can't do	309 (1.4%)	516 (2.3%)	
Yes with difficulty	9350 (42.5%)	9582 (43.5%)	
No difficulty	12346 (56.1%)	11903 (54.1%)	
Walking			< 0.001
Can't do	713 (3.2%)	1115 (5.1%)	
Yes with difficulty	11437 (51.6%)	12987 (58.6%)	
No difficulty	10051 (45.2%)	8026 (36.3%)	
Toilet			< 0.001
Can't do	273 (1.2%)	399 (1.8%)	
Yes with difficulty	2210 (10.0%)	2347 (10.2%)	
No difficulty	19299 (87.7%)	17955 (81.5%)	