Variability of pharmacological and nonpharmacological treatments across common shoulder conditions

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Background

Shoulder injuries are a prevalent form of musculoskeletal disorders and a common reason to seek healthcare. Health system level care utilization patterns for shoulder disorders have not been well described. In this study of US Military Health System beneficiaries we a) described usage of pharmacologic and non-pharmacologic treatments and b) determined if observed usage based on military or civilian health system.

Methods

This cohort included patients with an index outpatient shoulder disorder visit between 07/2014 and 04/2019. Patients were required to have no shoulder care in the prior 6 months and retain health system eligibility for 6-month pre- and 3-month post-index visits. Patients were excluded if the shoulder disorder was related to trauma, fracture, or amputation. Patients were then grouped into diagnostic categories: rotator cuff/sub-acromial joint syndrome (RC), acromioclavicular joint dysfunction (AC), glenohumeral instability (INS/DIS), glenohumeral hypomobility (HYPO), osteoarthritis (OA), non-specific shoulder disorders (NSP), and multiple diagnoses (+1). Healthcare use was classified into pharmacological (e.g. NSAIDS, opioids), non-pharmacologic (e.g. physical therapy, acupuncture), and diagnostic imaging (e.g. X-Ray, MRI). Number and percentage of patients who received care were summarized by diagnostic category and compared across military and civilian clinics.

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- Variability in care received for shoulder injury mostly coincided with what would be expected for a given diagnostic category.
- Compared to civilian clinics, military clinics had lower prescription rates for steroid injections and imaging, higher rates for physical therapy
- These data provide circumstantial evidence that system level factors may facilitate care inconsistent with best practice recommendations

Results

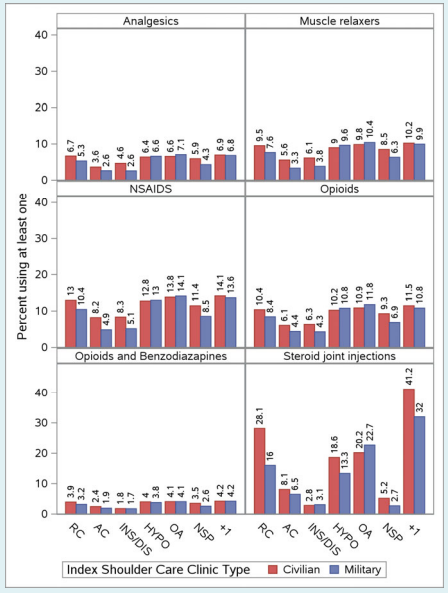
Tables are for analyzed cohort numbers and demographic summary
Figures are for health care use by military and civilian clinic

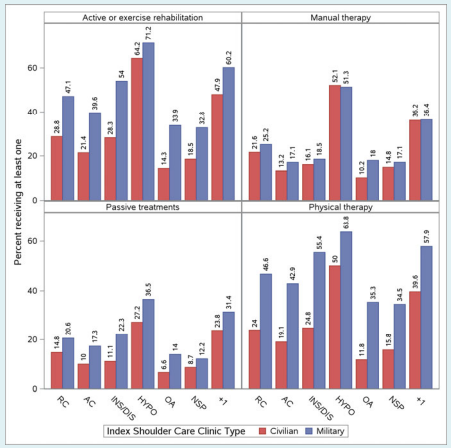
Table 1. Summary of Eligibility Criteria for the Analyzed Cohort

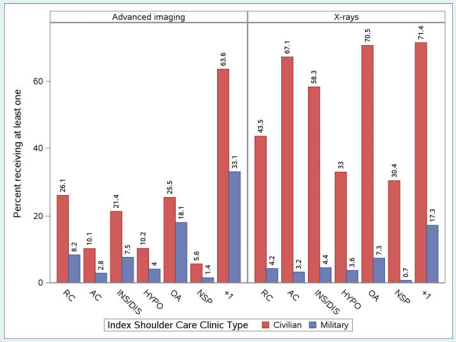
	Inclusion/Exclusion Criteria	Included	Excluded
1	Had at least one shoulder-related diagnosis or procedure code in CAPER, TEDNI, Ancillary, TEDI, or SIDR from January 2013 to July 2019	586,871	---
2	Had an index date (first shoulder-related diagnosis or procedure) in an outpatient setting (CAPEER or TEDNI) from July 2013 to March 2019. This allows for 6 months of pre-index washout period and 3 months of post-index follow-up.	564,825	22,046
3	Had MHS eligibility from 6 months before index date to 3 months after index date, allowing a 6-month gap in eligibility	563,239	1,586
4	Had no evidence of trauma from the index date to 3 months after	460,562	102,677
5	Had no evidence of open dislocation from the index date to 3 months after	460,544	18
6	Had no evidence of shoulder/humerus fracture from index date to 3 months after	456,449	4,095
7	Had no evidence of an amputation of the upper extremity not including only the digits from the index date to 3 months after	456,440	9
8	17 years old or older on the index date	456,439	1

Table 2 – Demographic Summary of Cohort by Shoulder Diagnostic Group

	1. Rotator Cuff (N=84730)	2. AC Joint (N=4013)	3. Instability/Dislocation (N=7088)	4. Hypomobility/Adhesive Capsulitis (N=11190)	5. Osteoarthrosis (N=13950)	6. Non-Specific Diagnosis (N=305895)	7. More than 1 Specific Disease (N=29573)	Total (N=456439)
Dataset where True Index Date Originated								
Military	41435 (48.9%)	2412 (60.1%)	4593 (64.8%)	4953 (44.3%)	5157 (37.0%)	194522 (63.6%)	9711 (32.8%)	262783 (57.6%)
Civilian	43295 (51.1%)	1601 (39.9%)	2495 (35.2%)	6237 (55.7%)	8793 (63.0%)	111373 (36.4%)	19862 (67.2%)	193656 (42.4%)
Patient Sex (concatenated)								
Missing	9018 (10.6%)	354 (8.8%)	1042 (14.7%)	1135 (10.1%)	1047 (7.5%)	50977 (16.7%)	2161 (7.3%)	65734 (14.4%)
Female	30290 (35.7%)	713 (17.8%)	1344 (19.0%)	5694 (50.9%)	4583 (32.9%)	102765 (33.6%)	10414 (35.2%)	155803 (34.1%)
Male	45422 (53.6%)	2946 (73.4%)	4702 (66.3%)	4361 (39.0%)	8320 (59.6%)	152153 (49.7%)	16998 (57.5%)	234902 (51.5%)
Patient Age								
N	84730	4013	7088	11190	13950	305895	29573	456439
Mean (SD)	43.32 (12.52)	32.60 (11.36)	29.89 (10.08)	47.47 (11.87)	49.98 (10.58)	39.59 (12.91)	48.25 (11.46)	41.14 (13.07)
Median	44.0	30.0	27.0	50.0	52.0	38.0	50.0	41.0
Q1, Q3	33.0, 54.0	23.0, 39.0	22.0, 35.0	40.0, 57.0	43.0, 59.0	28.0, 50.0	41.0, 57.0	30.0, 52.0
Range	(17.0-69.0)	(17.0-65.0)	(17.0-66.0)	(18.0-87.0)	(17.0-68.0)	(17.0-70.0)	(18.0-71.0)	(17.0-71.0)
Index Date Year								
2013	0 (0.0%)	0 (0.0%)	2 (0.0%)	0 (0.0%)	315 (2.3%)	0 (0.0%)	16 (0.1%)	333 (0.1%)
2014	19219 (22.7%)	1064 (26.5%)	927 (13.1%)	2646 (23.6%)	3228 (23.1%)	49212 (16.1%)	7297 (24.7%)	83593 (18.3%)
2015	14391 (17.0%)	1064 (26.5%)	1069 (15.1%)	1645 (14.7%)	2071 (14.8%)	43736 (14.3%)	4473 (15.1%)	68449 (15.0%)
2016	18074 (21.3%)	825 (20.6%)	1830 (25.8%)	2325 (20.8%)	2957 (21.2%)	69840 (22.8%)	5879 (19.9%)	101730 (22.3%)
2017	15088 (17.8%)	524 (13.1%)	1554 (21.9%)	1972 (17.6%)	2354 (16.9%)	64759 (21.2%)	5075 (17.2%)	91326 (20.0%)
2018	13469 (15.9%)	430 (10.7%)	1321 (18.6%)	1844 (16.5%)	2198 (15.8%)	59457 (19.4%)	4837 (16.4%)	83556 (18.3%)
2019	4489 (5.3%)	106 (2.6%)	385 (5.4%)	758 (6.8%)	827 (5.9%)	18891 (6.2%)	1996 (6.7%)	27452 (6.0%)







Bottom line: Shoulder injuries in the US Military Health System largely followed best practice recommendations for pain management; with opportunities to improve nonpharmacologic care delivery identified in specific areas (e.g. acupuncture).