Comparison of Volume, Reimbursement, Practice Styles, and Patient Characteristics Between Male and Female Surgeons who Perform Carpal Tunnel Release

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INTRODUCTION:

It is well established that female surgeons are underrepresented in musculoskeletal care. However, gender disparities go beyond solely representation. More recently, differences in Medicare reimbursement and practice style between male and female surgeons have been identified across Orthopaedic surgery as a whole. Few studies have investigated these variables on a procedural level and differences in patient demographics between male and female musculoskeletal surgeons have yet to be evaluated. An understanding of these changes at a more granular level may help elucidate both why disparities exist and how to address them. Thus, the purpose of this study was to evaluate differences in CTR volume, reimbursement, practice styles, and patient populations between male and female hand surgeons from 2013 to 2021.

METHODS: The Medicare Physician and Other Practitioners database was queried from 2013 to 2021. Procedure volume, reimbursement, surgeon information, and patient demographics were collected for any surgeon who performed at least 10 open CTRs (OCTR) or endoscopic CTRs (ECTR) that year. Welch's t-test, Kruskal-Wallis, and multivariable linear regressions were conducted to compare male and female surgeons and analyze geographical and annual differences.

RESULTS: From 2013 to 2021, the proportion of CTRs performed by female surgeons increased for OCTR by 4.5% (7.1% to 11.6%) and for ECTR by 3.3% (4.8% to 8.1%). The South had the slowest growth in the proportion of OCTRs performed by female surgeons (+3.8%) while the Northeast has the slowest growth for ECTR (+1.1%). Female OCTR surgeons on average had less beneficiaries per surgeon (443 vs 352, p<0.001), performed less billable services per beneficiary (6.37 vs 5.35, p=0.03), and performed less unique billable services (91.2 vs 77.8, p<0.001) compared to males. Female OCTR surgeons also saw a lower percentage of White patients (88.1 vs 86.5, p=0.003) and a higher percentage of female (60.1 vs 61.7, p<0.001) and dual enrolled Medicare-Medicaid patients (10.5 vs 11.2, p=0.046).

DISCUSSION AND CONCLUSION:

This study demonstrated increases in the proportion of OCTRs and ECTRs performed in the Medicare population by female surgeons nationally and across all regions at varied rates. Growth of female surgeons performing OCTR was slowest in the South, while growth of female surgeons performing ECTR was slowest in the Northeast. Significant differences in practice style and patient populations were identified between male and female surgeons performing OCTR. Male surgeons performing OCTR billed for more services and performed more services per beneficiary while also treating a lower proportion of non-White patients and dual-Medicare-Medicaid enrollees compared to female surgeons. Future research should continue to examine these trends on a procedural basis to ensure equitable hand care for patients.

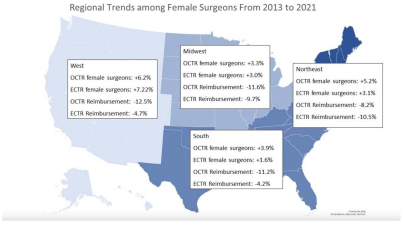

Table 1: Gender Differences in Open Carpal Tunnel Release

	2013			2019			2021		
	Male	Female	p-value	Male	Female	p-value	Male	Female	p-value
Surgeons	2309	162	n/a	2323	243	n/a	2030	249	n/a
OCTR Volume	65920	5013	n/a	72770	8120	n/a	61010	8006	n/a
Reimbursement	$348.91	$353.38	**0.03**	$323.72	$331.85	**0.002**	$312.84	$316.26	0.18
OCTRs per Surgeon	28.55	30.94	0.13	31.33	33.42	0.14	30.05	32.15	0.12
Average Beneficiaries per Surgeon	458.00	314.86	**<0.001**	476.19	353.37	**<0.001**	443.37	354.20	**<0.001**
Total Annual Services Per Surgeon	2887.64	1720.17	**<0.001**	2952.27	1905.06	**<0.001**	2822.31	1894.72	**<0.001**
Average Services Per Beneficiary	6.30	5.46	**<0.001**	6.20	5.39	**0.005**	6.37	5.35	**0.03**
Unique Services Billed	106.38	86.21	**<0.001**	97.40	80.82	**<0.001**	91.13	77.79	**<0.001**
Beneficiary Average Age	72.05	71.32	**<0.001**	72.67	72.16	**<0.001**	73.08	72.65	**<0.001**
Beneficiary Average HCC	1.15	1.13	0.49	1.17	1.16	0.96	1.07	1.06	0.64
Beneficiary Average % White	88.65	87.14	**0.01**	88.07	86.28	**0.003**	88.14	86.48	**0.003**
Beneficiary Average % Female	62.34	63.12	**<0.001**	60.70	62.46	**<0.001**	60.06	61.70	**<0.001**
Beneficiary Average % Dual Medicare and Medicaid	17.23	16.83	0.70	13.22	13.31	0.23	10.54	11.22	**0.046**

* HCC = hierarchal condition category. HCC is a validated measurement of a patient's comorbidity profile that is normalized to 1.0 for the standard patient

Table 2: Gender Differences in Endoscopic Carpal Tunnel Release

	2013			2019			2021		
	Male	Female	p-value	Male	Female	p-value	Male	Female	p-value
Surgeons	557	25	N/A	769	61	N/A	777	64	N/A
CTR Volume	19634	985	N/A	28387	2216	N/A	26123	2316	N/A
Reimbursement	$432.96	$417.57	0.21	$397.72	$405.38	0.20	$380.05	$392.20	0.15
CTRs per Surgeon	35.25	39.40	0.49	36.91	36.33	0.88	33.62	36.19	0.46
Average Beneficiaries per Surgeon	413.41	347.64	0.17	473.65	424.30	0.12	450.24	419.06	0.27
Total Annual Services Per Surgeon	2473.42	2084.68	0.28	2804.69	2466.87	0.21	2757.85	2432.28	0.22
Average Services Per Beneficiary	5.98	6.00	0.81	5.92	5.81	0.75	6.13	5.80	0.84
Unique Services Billed	106.03	84.40	**0.003**	102.68	89.62	**<0.001**	96.41	90.75	0.068
Beneficiary Average Age	72.28	72.18	0.90	72.70	72.43	0.16	73.09	72.79	0.35
Beneficiary Average HCC	1.13	1.08	0.52	1.16	1.14	0.21	1.06	1.06	0.40
Beneficiary Average % White	88.22	88.87	0.99	87.22	87.28	0.72	87.30	88.62	0.31
Beneficiary Average % Female	61.39	61.91	0.20	60.01	61.46	**0.02**	59.52	61.16	**0.003**
Beneficiary Average % Dual Medicare and Medicaid	14.87	12.45	0.82	11.86	12.55	0.60	9.75	9.95	0.60

* HCC = hierarchal condition category. HCC is a validated measurement of a patient's comorbidity profile that is normalized to 1.0 for the standard patient