Characterization of Trabeculectomy Use and the Impact of COVID-19 in Medicare Beneficiaries with Primary Glaucoma by US Region

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INTRODUCTION

> Glaucoma is an optic neuropathy characterized by irreversible visual impairment, with a 2% to 7% prevalence in US adults over 65 years old.[1]

> Primary glaucomas (PGs), the most common types of glaucoma, are caused by increased intraocular pressure, which can lead to irreversible blindness.

> Trabeculectomy is a common, outpatient surgery to relieve intraocular pressure by draining fluid from the eye.

> Other therapy options to relieve intraocular pressure include eyedrops, oral medications, eye stents or other procedures such as minimally invasive glaucoma surgery (MIGS).[2]

OBJECTIVES

> The objective of this study is to characterize US Medicare patients with PGs and assess possible regional variations in trabeculectomy use in the context of the COVID-19 pandemic.

METHODOLOGY

> A retrospective analysis was conducted using Medicare LDS inpatient, outpatient, and carrier claims from 2017-2021.

> Eligible patients were were identified via ICD-10-CM codes for PGs in the inpatient, outpatient, or carrier files.

> Patients determined eligible were categorized by region based on the 2020 US Census definition.

> Analysis-eligible patients had to meet the following additional criteria:

- Continuous Part A/B coverage and alive throughout the study period
- 65 years or older in 2017
- Included in the 5% representative carrier data sample

Primary Glaucoma* : 146,340

↓

Continuous Part A and B coverage over 5 years: 101,094

↓

Age 65+ and alive through study period: 93,254

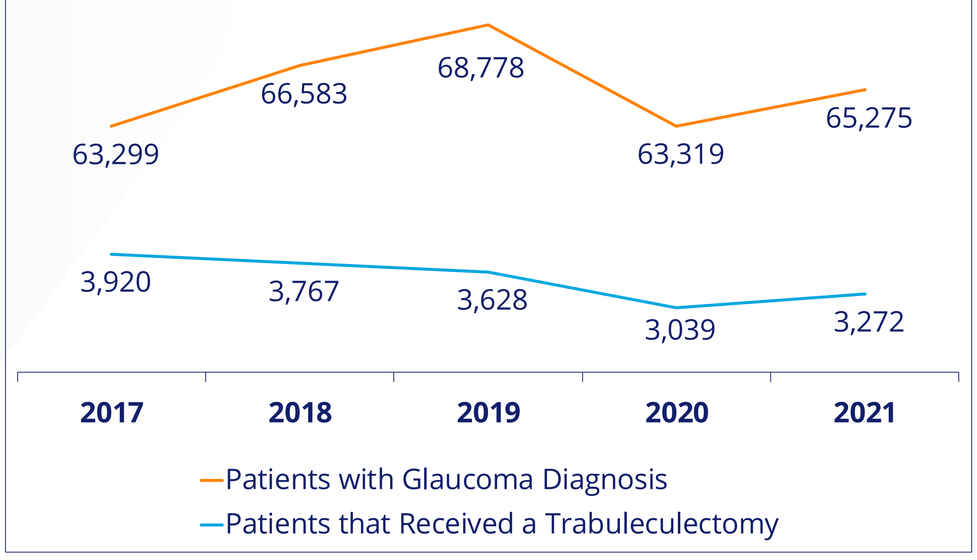
*Primary Glaucoma determined via ICD-10-CM diagnosis code of H40.11, H40.12, or H40.2 with ≥1 inpatient, ≥1 outpatient OR ≥2 carrier claims and in the 5% sample. The first 9 diagnosis codes were used for initial patient identification across files.

RESULTS

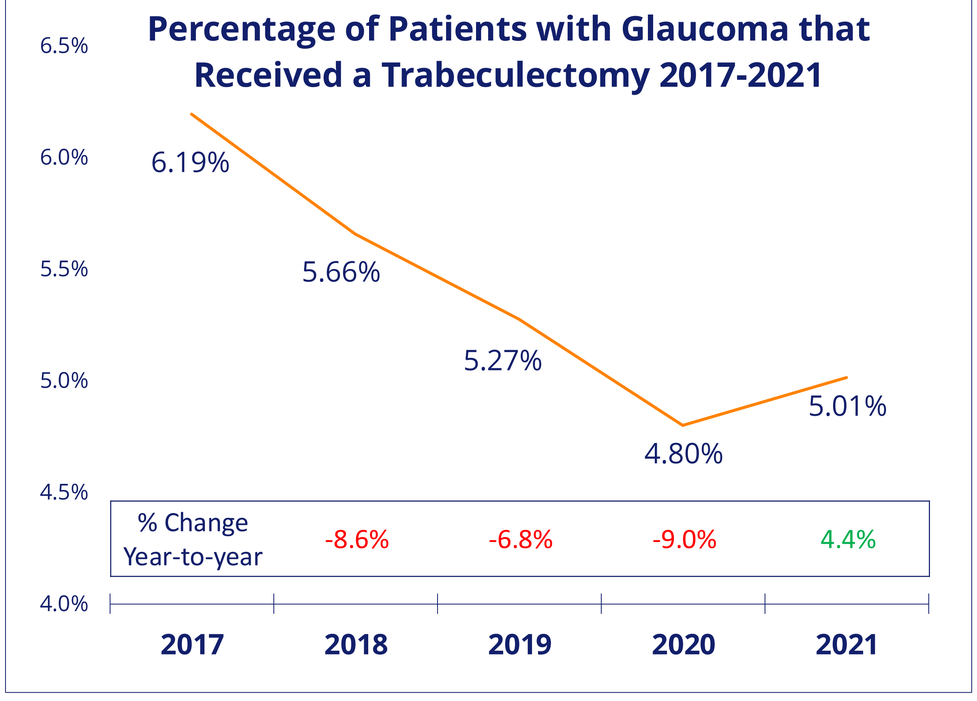
Patient Demographics	
Sample N	**93,254**
Average Age (2021), in years	79.6
Median Age (2021)	79
Age Range	69-98
Age Distribution	N (%)
69-75	31,217 (33%)
76-85	41,877 (45%)
86-95	18,524 (20%)
96 +	1,636 (2%)
Sex Distribution	N (%)
Female	55,161 (59%)
Male	38,093 (41%)
Race/Ethnicity	N (%)
Unknown	1,338 (1%)
White	72,574 (78%)
Black	12,544 (13%)
Other	2,223 (2%)
Asian	2,487 (3%)
Hispanic	1,659 (2%)
North American Native	429 (<1%)
US Region[3] (2021):	N (%)
Northeast[a] (NE)	18,169 (19%)
Midwest[b] (MW)	19,305 (21%)
South[c] (S)	37,262 (40%)
West[d] (W)	18,141 (19%)
Other[e]	377 (<1%)
Type of Glaucoma (≥1 claim):	N (%)
Primary open-angle (POAG) (H40.11/H40.12)	90,809 (97%)
Primary angle-closure (PACG) (H40.2)	6,504 (7%)
Patients with Diagnoses of both POAG and PACG	3,881 (4%)

a.) NE includes: NY, NJ, PA. RI, CT, MA, VT, NH, ME; b.) MW includes: ND, SD, NE, KS, MN, IA, MO. WI, IL, IN, OH, MI; c.) S includes: TX, OK, AR, LA. MS, AL, TN, KY. FL, GA, SC, NC, WV, VA, DC, MD, DE; d.) W includes: AK, CA, HI, OR, WA. WY, NV, UT, MT, NM, ID, CO, AZ; e.) Other includes: PR, Virgin Islands, blanks, Europe, Guam, American Samoa, Canada

Number of Patients with a Claim for Primary Glaucoma and Patients that Received a Trabeculectomy in 2017-2021



Percentage of Patients with Glaucoma that Received a Trabeculectomy 2017-2021



- The number of patients with annual medically attended PG decreased from 68,778 in 2019 to 63,319 in 2020 and rebounded to 65,275 in 2021.
- Approximately 600 fewer patients received a trabeculectomy in 2020 than 2019, and only ~250 more patients received a trabeculectomy in 2021.
- There was a modest decline in rate of trabeculectomy from 5.3% in 2019 to 4.8% in 2020 and rebounding to 5.0% in 2021.
- The rate of decline in trabeculectomy use from 2019 to 2020 was below the national average of -9% in the MW (-15%) and NE (-12%), albeit the change in 2020-2021 was much higher in both of these regions, MW (7%) and NE (14%) versus the national average of 4%.
- The West region saw the least decline in trabeculectomy use from 2019 to 2020 (-1%) with the South region aligning closely with the national average (-8.7%).

Regional Breakdown						
	Region	**2017**	**2018**	**2019**	**2020**	**2021**
% of PG Patients Receiving a Trabeculectomy, (% Change year-to-year)	Northeast	7%	6%	5%	5%	5%
		-	(-13%)	(-7%)	(-12%)	(14%)
	Midwest	6%	5%	5%	4%	5%
		-	(-10%)	(-1%)	(-15%)	(7%)
	South	6%	6%	5%	5%	5%
		-	(-6%)	(-11%)	(-9%)	(5%)
	West	7%	6%	6%	6%	6%
		-	(-9%)	(-1%)	(-1%)	(-6%)
	Other	8%	6%	6%	4%	4%
		-	(-30%)	(-6%)	(-27%)	(-12%)

CONCLUSION

> This analysis of US Medicare Part A/B claims revealed a nationwide concurrent decline in 2020 of medically attended PG and trabeculectomy rates, both rebounding in 2021.

> Notably, trabeculectomy decline was apparent before 2020, already decreasing by >5% in 2018 and 2019 before a larger drop-off in 2020. This decline was highest in the Midwest and Northeast, which both rebounded in 2021.

> Additional research is warranted to further investigate drivers of trabeculectomy decline, including alternative procedures for PG and impact on outcomes.

REFERENCES

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