

The Impact of an Integrated Outpatient Specialty Neurology Pharmacist in a Non-MS Clinical Setting



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CONCLUSION

Over 3 months, outpatient specialty neurology pharmacists **performed 2,244 interventions in 741 patients** that often resulted in a recommendation for therapy change or additional monitoring

Pharmacists avoided **direct costs of up to almost \$200,000**

OBJECTIVE

To examine the role of an integrated outpatient specialty neurology pharmacist in the non-MS setting by evaluating interventions performed

METHODS

Setting	<ul style="list-style-type: none">Outpatient non-MS neurology clinics (ATTR amyloidosis, Autonomics, Epilepsy, Inpatient, Movement disorders, Neuromuscular, Others) at an academic medical center with an integrated specialty pharmacy
Design	<ul style="list-style-type: none">Single-center, retrospective cohort studyJanuary 2023 – March 2023
Sample	<ul style="list-style-type: none">All patients prescribed a specialty medication from the non-MS Neurology clinics at Vanderbilt University Medical Center with at least one pharmacist intervention performed during the study period
Data Procedures	<ul style="list-style-type: none">Data was collected from the electronic health record and specialty pharmacy management systemInterventions documented by the pharmacist during normal clinical practice were extracted and reviewed
Analysis	<ul style="list-style-type: none">Cost avoidance: estimated by calculating the total costs of medications associated with a follow-up outcome of discontinuation, medication change, or dose changeOrdinal mixed effects regression model for the factors associated with greater intervention time<ul style="list-style-type: none">Covariates: filling pharmacy, clinic, age, and prescription insurance

Primary Outcome

- Number of interventions resulting in a recommendation made to a provider or patient
- Time pharmacist spent on interventions

Secondary Outcomes

- Outcome of recommendations
- Intervention impact score*
- Cost avoidance
- Factors associated with greater intervention times
- Number of recommendations accepted

*Impact score definition

- review only, no intervention needed
- quality of life impact, intervention needed
- negative impact on health, intervention needed
- ED, hospitalization, or death likely, intervention needed

RESULTS

Table 1: Baseline Demographics (N=741)

Age, years, median (IQR)	60 (22-72)
Sex, male, n (%)	406 (55)
Race, White, n (%)	599 (83)
Primary Pharmacy Insurance, n (%)	
Medicare	340 (46)
Commercial	221 (30)
Medicaid	132 (18)
Tricare/Other	30 (4)
None	18 (2)
Integrated Pharmacy Status, yes, n (%)	511 (69)

IQR: interquartile range

Figure 1: Pharmacist Interventions Resulting in Recommendations

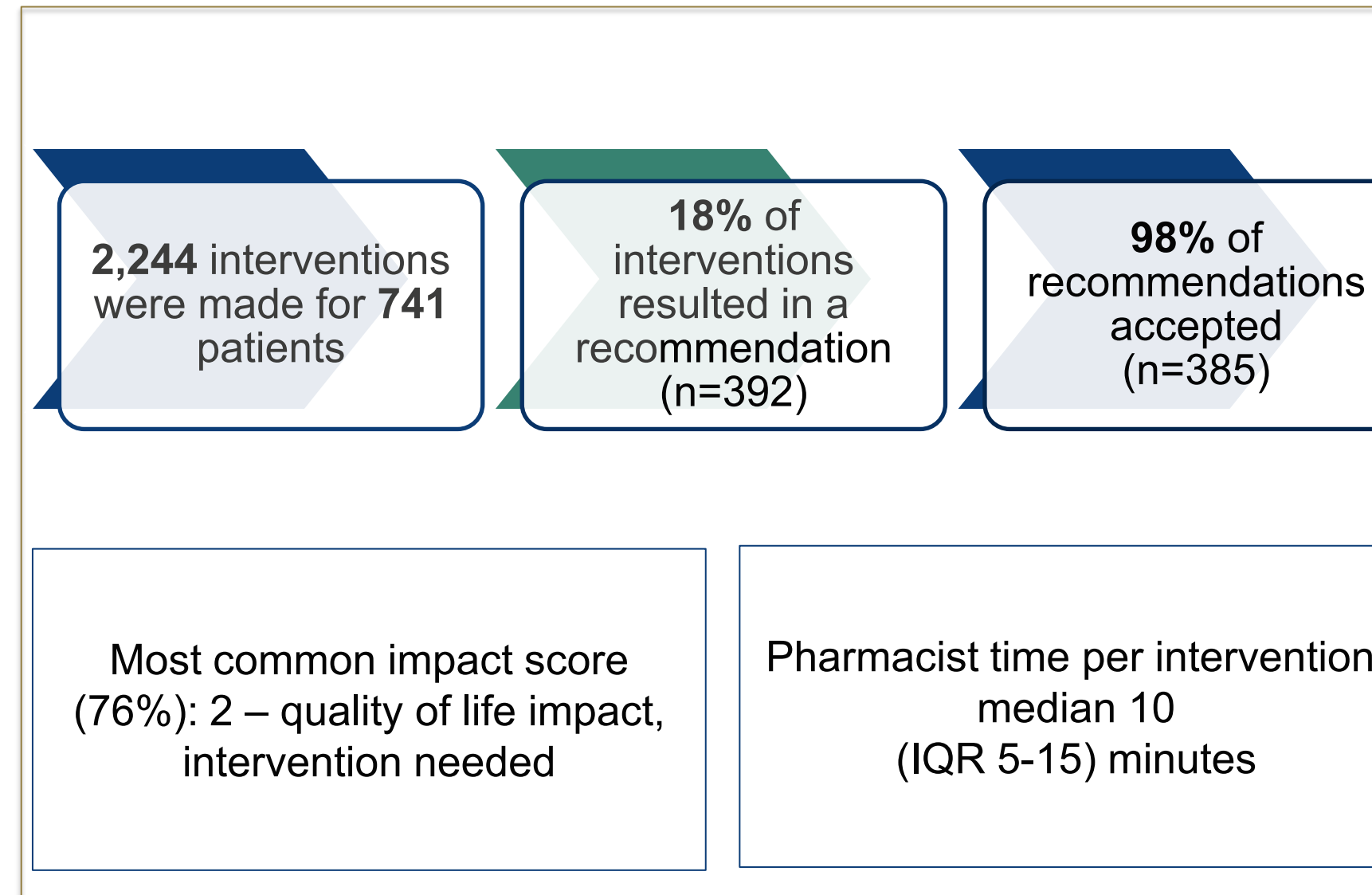


Figure 2: Pharmacist Recommendation Outcome

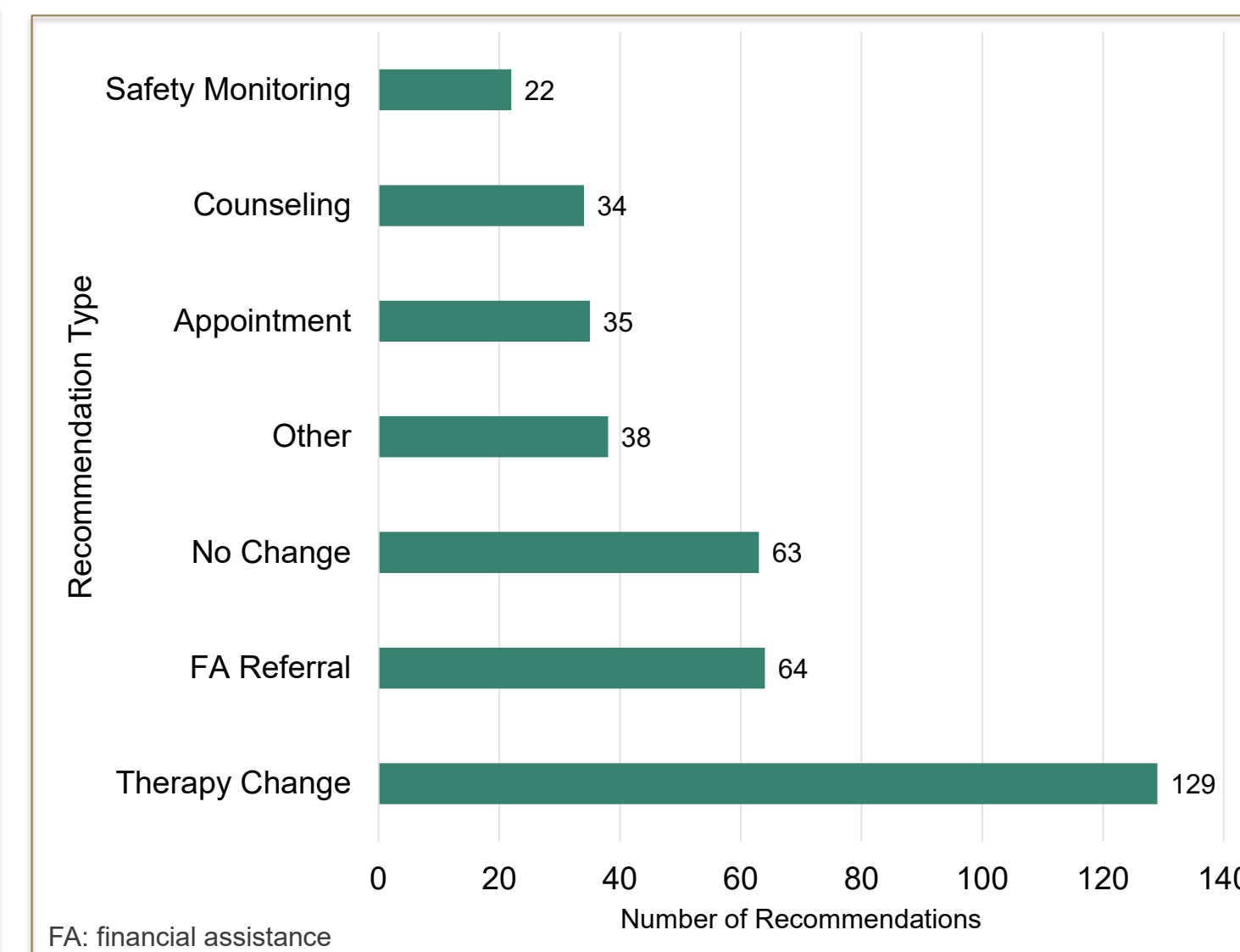
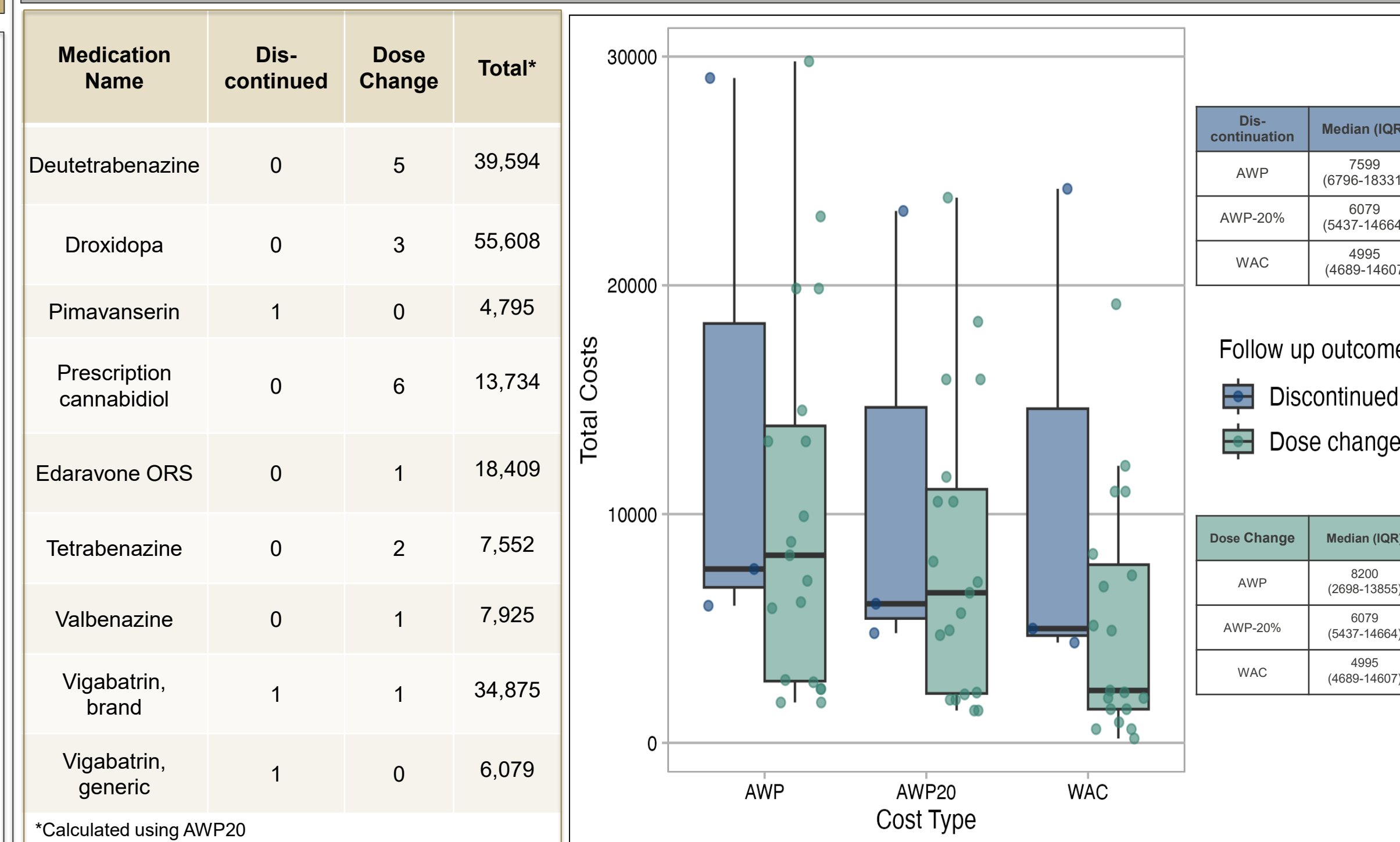


Figure 3 and Table 2: Cost Avoidance Due to Recommendations and by Medication



\$ Cost avoidance totaled **\$188,570** using the average wholesale price minus 20%
Dose changes resulted in **\$154,446** in cost savings while discontinuations totaled **\$34,124**

AWP: average wholesale price; AWP20: AWP – 20%; WAC: wholesale acquisition cost

Figure 4: Factors Associated with Greater Intervention Time

Ordinal mixed effects regression model - Odds Ratio				
Confidence Interval				
Variable	Odds Ratio	LowerCI	UpperCI	PValue
VSP Patient (Ref = No)				
Yes	0.856	0.718	1.018	0.079
Clinic (Ref = Movement Disorders)(n=908)				
Amyloidosis (n=121)	0.696	0.487	0.995	0.047
Autonomics (n=323)	1.259	0.998	1.587	0.052
Epilepsy (n=518)	0.734	0.544	0.990	0.043
Inpatient (n=159)	0.672	0.486	0.927	0.015
Neuromuscular (n=311)	1.267	0.972	1.652	0.079
Other (*n=4)	3.959	0.899	17.427	0.069
Age				
Years	1.001	0.995	1.006	0.833
Rx Insurance (Ref = Commercial)				
Medicaid	0.829	0.636	1.081	0.166
Medicare	0.820	0.656	1.024	0.08
None	1.385	0.807	2.382	0.238
Tricare or Other	0.848	0.569	1.262	0.417

Clinic specialty was associated with longer intervention time (p < 0.001)

*Other: allergy/immunology, outside provider, headache, and psychiatry

Table 3: Represented Medications (N=788)*

Medication Name	% (n)
Inotersen	0 (2)
Istradefylline	1 (7)
Apomorphine sublingual	1 (7)
Everolimus	1 (7)
Sodium Phenylbutyrate/ursodiolcortaurine	1 (7)
Immune globulin subcutaneous (human) 20% liquid	2 (12)
Vigabatrin	2 (17)
Edaravone ORS	3 (24)
Riluzole	3 (25)
Amantadine extended-release capsule	3 (25)
Tetrabenazine	4 (35)
Other (non-specialty medication)	5 (39)
Tafamidis	6 (45)
Pimavanserin	6 (48)
Valbenazine	6 (50)
Deutetrabenazine	12 (93)
Droxidopa	19 (147)
Prescription cannabidiol	25 (198)

*The number of patients on each medication with an intervention