Anticonvulsant Medication Polypharmacy Review: A descriptive study of value-based care practices in the management of seizure disorders in a pediatric special needs population

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INTRODUCTION

- The rise of healthcare costs, clinical inefficiency, and duplication of services burden our society with the task of finding solutions to decrease cost.
- The concept of value based care departs from the traditional fee-for-service approach and focuses on an evidence-based, cost-effective way to improve health for those with chronic conditions by suggesting reimbursement for outcomes received rather than volume of services delivered.
- Value encompasses the appropriateness of care and utilization of resources for a specific disease group.
- As a New York State designated Center of Excellence, The Center for Discovery is researching potential metrics to be considered for Value-Based Payment Model within services for people with developmental disabilities.

STUDY DEFINITIONS

- **Value** = number of good clinical outcomes per cost spent to deliver those outcomes
- **Cost** = actual resources involved in patient's care process (i.e. time, resources, support)
- **Value Based Care**: An emerging solution addressing rising health care costs, clinical inefficiency and duplications of services. Focuses on improving health of those with chronic conditions in an evidence-based, cost-effective way (i.e. reimbursement for outcomes achieved rather than volume of services delivered)
- **Center of Excellence (COE)**: A team of highly skilled experts involved in research and innovation to advance their field and establish guidelines or standards specific to their endeavors
- **Polypharmacy**: the use of 2 or more same-class medications to treat a single diagnosis
- The key principles driving Centers for Medicare Medicaid (CMS) Heirarchical Condition Category (HCC) Risk Adjustment are calculations which are depended upon accurate documentation leading to accurate coding

OBJECTIVES AND GOALS

- To determine what each medical condition affecting our patient population needs, what constitutes a valuable outcome, and how to properly document good outcomes
- To determine the prevalence of polypharmacy treatment regimens at The Center for Discovery for pediatric residents with documented, diagnosed seizure disorders
- To define value based care as it pertains to our population with seizure disorder and to determine how to effectuate optimal value-based care.
- To investigate the role of polypharmacy in seizure disorder management and the associated metrics
- To identify the necessity of polypharmacy in this population with seizure disorders, optimize care for these patients to create valuable outcomes, and in effect lower the cost and burden on healthcare

METHODS AND CATEGORIES

- **Study Design**: Retrospective Chart Review using documentation from eClinicalWorks (neurology notes) and SigmaCare (list of ordered medications) over the course of one year
- Categorization into Groups of Diagnoses (ICD-10) and Medications (Classes of Anticonvulsants)

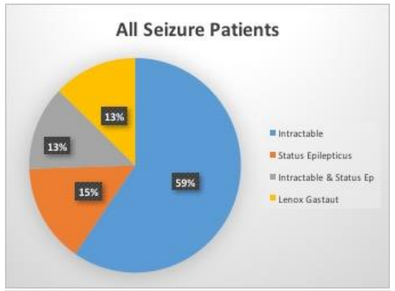
Seizure Disorder Categories (ICD-10)			
Focal Partial	**Generalized**	**Absence**	**Myoclonic**
G40.0* Idiopathic epilepsy and epileptic syndromes with seizures of localized onset	G40.3* Idiopathic epilepsy and epileptic syndromes	G40.A* Absence epileptic syndrome*	G40.B* Juvenile myoclonic epilepsy [impulsive petit mal]*
G40.1* Symptomatic epilepsy and epileptic syndromes with simple partial seizures	G40.4* Other generalized epilepsy and epileptic syndromes		
G40.2* Symptomatic epilepsy and epileptic syndromes with complex partial seizures			

External Causes and Other Epilepsy, seizures	Lennox-Gastaut	Epileptic Spasms and Disorder of Muscles
G40.5 Epileptic seizures related to external causes	G40.81* Lennox-Gastaut Syndrome	G40.82* Epileptic spasms
G40.8 Other epilepsy and recurrent seizures		M62.40 Contracture of muscle, unspecified site
G40.80* Other epilepsy		M62.49 Contracture of muscle, multiple sites
G40.89 Other seizures		
G40.9* Epilepsy, unspecified		

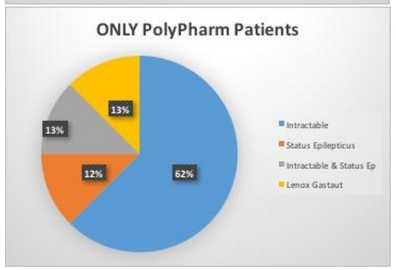
Anticonvulsant Medication Categories			
Ion Channel Blockade	**GABA Activity Modulator**	**Benzodiazepine**	**Multi-mechanism**
Dilantin – Phenytoin	Neurontin - Gabapentin	Ativan – Lorazepam	Depakote – Divalproate sodium
Lamictal – Lamotrigine	Sabril - Vigabatrin	Diastat – Diazepam PR Valium – Diazepam PO	Keppra - Leviteracetam
Tegretol – Carbamazepine Carbatrol – Carbamazepine ER	**Barbiturate**	Onfi – Clobazam	Topamax - Topimarate
Trileptal – Oxcarbazepine	Mysoline – Primidone	Tranzene – Clorazepate dipotassium	**AMPA Glutamate Receptor Agonist**
Vimpat - Lacosamide	Phenobarbital	Versed - Midazolam	Fycompa – Perampanel

RESULTS

- 176 total patients reviewed in pediatric resident population in a 1 year snapshot
- 20 unique anticonvulsant medications prescribed
- 54% (n=95) of patients reviewed were prescribed anticonvulsants
- 76.8% of patients prescribed anticonvulsants are for management of a seizure disorder, 22% prescribed for behavior, 7% prescribed for spasticity, and 1% prescribed for muscle contractions



- Of the patients on anticonvulsants with diagnosed seizure disorder, 59% have intractable seizures, 15% have status epilepticus, 13% have intractable seizure with status epilepticus and 13% have Lennox-Gastaut



- The types of seizure disorders found in the patients treated with anticonvulsant polypharmacy regimen are focal partial (42%), epilepsy unspecified (33%), generalized (17%), and Lennox-Gastaut (8%)

- 13.7% (n=10) of patients receive ≥ 2 anticonvulsant medications of the same class for the management of one seizure disorder diagnosis indicating that these patients are receiving a polypharmacy treatment regimen (20.5% [n=15] polypharmacy regimen with PRN medications)
- The distribution of anticonvulsant medications that were prescribed was found as follows: Benzodiazepines 37%, Multi-mechanism Anticonvulsant 32%, Voltage Dependent Sodium Channels 25%, GABA Activity Modulator 3%, Barbiturates 2%, AMPA Glutamate Receptor Agonist 2%
- Average Neurology Office Visits: 3.6 average visits for patients with seizure disorder managed by anticonvulsants vs. 4.1-4.2 average visits yearly for patients on polypharmacy regimen
- On average, patient seeing a neurology practitioner for a seizure disorder is prescribed 2.16 anticonvulsant classes.

CONCLUSION

- **Polypharmacy:** 13.7% pediatric residents on anticonvulsant polypharmacy regimen for management of seizure disorder. There was a similar distribution of seizure types in patients on anticonvulsant polypharmacy regimen compared to those prescribed anticonvulsant monotherapy for management of a specific seizure diagnosis. Benzodiazepines, Sodium Channel Inhibitors, and Multi-Mechanism Anticonvulsants make up 94% of the total prescribed anticonvulsants in polypharmacy regimens.
- **Resource Allocation:** There was no drastic difference between the usage of anticonvulsant polypharmacy regimen, neurology office visits, and anticonvulsants prescribed in our patient population.
- **Documentation:** Similar distribution of seizure types in patients on anticonvulsant polypharmacy regimen compared to those prescribed anticonvulsant monotherapy for management of specific seizure diagnosis. Medications are not linked or associated to specific seizure disorders in documentation since at times anticonvulsant medication can cover multiple types of seizures

DISCUSSION AND LIMITATIONS

- Found no correlation with the severity of seizure disorder and polypharmacy regimen
- No a clear link to which itemized diagnoses codes correlate with which specific anticonvulsant
- Did not include patients who have seizure diagnoses not requiring anticonvulsants and have been seizure free
- Comorbid conditions (i.e. Autism Spectrum Disorder, Cerebral Palsy, etc.) not taken into account in this investigation
- Could not properly assess the severity of the seizure condition (i.e. number of seizures per year, dosages of medications and number of dose changes, number of times PRN diazepam was needed, number of times hospitalized for seizure disorder, etc.)

FUTURE DIRECTIONS

- Further analysis of data and diagnoses in data group collected with regard to the necessity of polypharmacy for certain seizure diagnoses and standard of care for these chronic conditions.
- Determine "high risk" criteria for polypharmacy in patients with seizure disorder
- Explore broader patient population (i.e. outpatient and adults)
- Explore comorbid medical conditions and polypharmacy
- Investigate impact of proper documentation and impact of ability to link specific medication to exact diagnosis codes and how those medications are helping manage seizure disorders

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