THE UNIVERSITY OF CHICAGO MEDICINE
Comer Children's Hospital
AT THE FOREFRONT OF KIDS MEDICINE

Epilepsy Classification and Treatment

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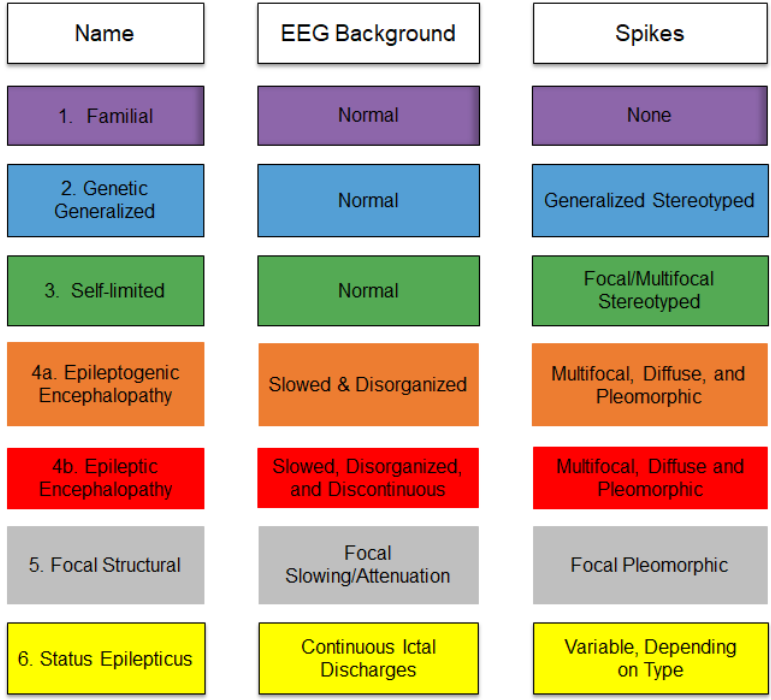
Daemones Eicite
Civitatem Secundus

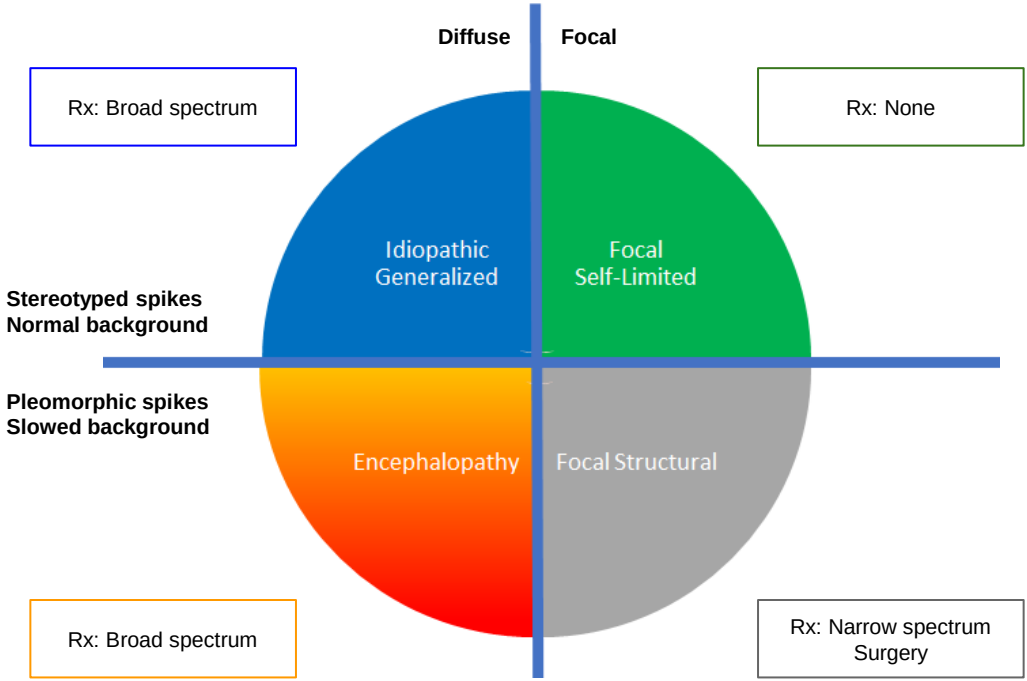
Electroclinical Syndromes

EEG Features	Neonatal	Infancy	Childhood	Adolescence
1. Normal	- Benign familial neonatal epilepsy	- Benign familial infantile epilepsies - Febrile seizures	- AD nocturnal frontal lobe epilepsy	- AD with auditory features - AD familial temporal lobe
2. Generalized stereotyped spikes; normal background	- No recognized syndromes	- Myoclonic epilepsy infancy - Febrile seizures	- Myoclonic atonic epilepsy (Doose) - Childhood absence epilepsy - Epilepsy with myoclonic absence - Eyelid myoclonia with absence (Jeavons)	- Juvenile absence epilepsy - Juvenile myoclonic epilepsy -Epilepsy with GTCs
3. Focal/Multifocal Stereotyped Spikes; Normal Background	- No recognized syndromes	- Febrile Seizures	- Panayiotopoulos syndrome - Benign Epilepsy Centro-Temporal Spike (Rolandic) - Late onset occipital (Gastaut)	- With frontal foci
4a. Multifocal Spikes; Background Slowing	- No recognized syndromes	- Dravet; EFMR - Migrating focal seizures - Non-progressive myoclonic status	- Landau Kleffner syndrome - Continuous spike wave sleep	- Progressive myoclonus epilepsies
4b. Multifocal spikes, discontinuity, background slowing	- EME (Aicardi) - EIEE (Ohtahara)	- West syndrome - Late Infantile Epileptic Encephalopathy	- Lennox-Gastaut syndrome	

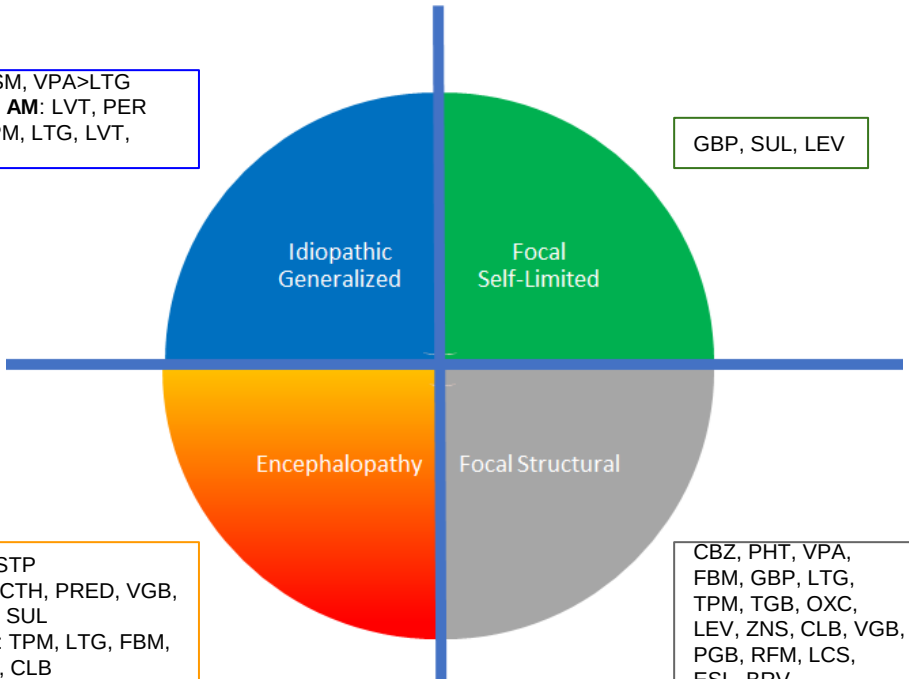
Non-Syndromic Epilepsies

5. Focal pleomorphic spikes; focal slowing/attenuation	- Epilepsies due to focal structural lesions - Can have homotopic EEG foci (febrile seizures)


Name
EEG Background
Spikes
1. Familial
Normal
None
2. Genetic Generalized
Normal
Generalized Stereotyped
3. Self-limited
Normal
Focal/Multifocal Stereotyped
4a. Epileptogenic Encephalopathy
Slowed & Disorganized
Multifocal, Diffuse, and Pleomorphic
4b. Epileptic Encephalopathy
Slowed, Disorganized, and Discontinuous
Multifocal, Diffuse and Pleomorphic
5. Focal Structural
Focal Slowing/Attenuation
Focal Pleomorphic
6. Status Epilepticus
Continuous Ictal Discharges
Variable, Depending on Type


Diffuse
Focal
Rx: Broad spectrum
Rx: None
Idiopathic Generalized
Focal Self-Limited
Stereotyped spikes
Normal background
Pleomorphic spikes
Slowed background
Encephalopathy
Focal Structural
Rx: Broad spectrum
Rx: Narrow spectrum Surgery

AAN Class I Data for Anticonvulsant Medications



AZM

Acetazolamide

FORMULATIONS:

Extended release tablet: 500 mg
Tablet: 125, 250 mg
Solution: 25 mg/ml

DOSING:

Initial: 3-6 mg/kg/day, daily or divided BID
Maintenance: 10-30 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: paresthesias, ataxia, dizziness, fatigue, tinnitus
-GI: nausea, vomiting, diarrhea
-Nephro: hyponatremia, hypokalemia, crystalluria, metabolic acidosis

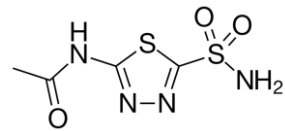
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
	X	X	X					

AZM

Acetazolamide

CHEMICAL STRUCTURE:



1

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
						Inhibits carbonic anhydrase

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.3 L/kg	2.5-5.8 hr	95	100		

ACTH

Corticotropin

FORMULATIONS:

IM: Gel 80 IU/mL

DOSING: (infantile spasms)

Week 1-2: 75 IU/m2 BID
30 IU/m2 for 3 days
15 IU/m2 for 3 days
10 IU/m2 for 3 days
10 IU/m2 every other day (for 3 doses)

COMMON SIDE EFFECTS:

-CV: hypertension
-Endo: weight gain, hyperglycemia, electrolyte imbalance, cushingoid features
-Psych: irritability
-Other: gastritis, infection

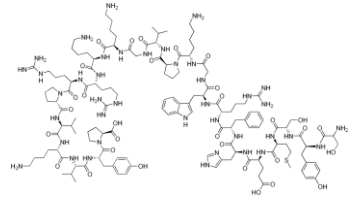
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets

ACTH

Corticotropin

CHEMICAL STRUCTURE:



2

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
						X

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
	15 min				

BRV

Brivaracetam

FORMULATIONS:

Tablet: 10, 25, 50, 75, 100 mg
Solution: 10 mg/ml
IV: 50 mg/5 ml

DOSING:

Initial: 1 mg/kg/day, divided BID
Maintenance: 1-5 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: somnolence, dizziness
-GI: nausea, vomiting

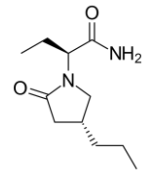
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets

BRV

Brivaracetam

CHEMICAL STRUCTURE:



3

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
					X	

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.5 L/kg	9 hr	17	95		CYP2C

BRM

Bromides

FORMULATIONS:

Tablet: 850 mg

DOSING:

Initial: 30 mg/kg/day, divided BID
Maintenance: 50-80 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: fatigue, drowsiness
-GI: loss of appetite, weight loss
-Other: acne

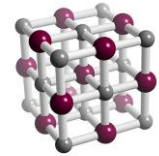
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
				X				

BRM

Bromides

CHEMICAL STRUCTURE:



4

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
			X			

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
	12 days	0	100	80-120	

CBD

Cannabidiol

FORMULATIONS:

Solution: 100 mg/mL

DOSING:

Initial: 5 mg/kg/day, divided BID
Maintenance: 10-25 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: somnolence
-GI: diarrhea, emesis, decreased appetite
-Other: pneumonia

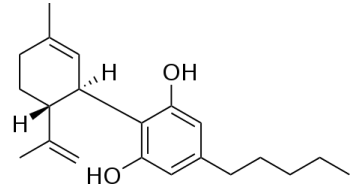
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
			X					

CBD

Cannabidiol

CHEMICAL STRUCTURE:



5

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
						X

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
30,000	58.5 hr	94	Minimal		CYP, UGT

CBZ

Carbamazepine

FORMULATIONS:

Tablet: 200 mg
Chew tablet: 100 mg
Solution: 100 mg/5 mL
Extended release tablet: 100, 200, 400 mg

DOSING:

Initial: 5-10 mg/kg/day, divided BID or TID
Maintenance: 10-40 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: sedation, dizziness, ataxia, double vision
-GI: nausea, vomiting, diarrhea
-Other: hyponatremia

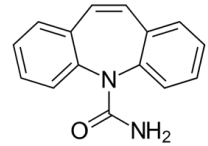
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
X	X	X	X	X	X	X		X

CBZ

Carbamazepine

CHEMICAL STRUCTURE:



6

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
X						

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
1.1	3-20 hr	75	<1	4-12	CYP3A, 2C; UGT

CLB

Clobazam

FORMULATIONS:

Tablet: 10, 20 mg
Solution: 2.5 mg/ml

DOSING:

Initial: 0.5 mg/kg/day, divided BID
Maintenance: 0.5-2 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: sedation, cognitive impairment
-Psych: aggressiveness
-GI: loss of appetite, constipation, hypersalivation

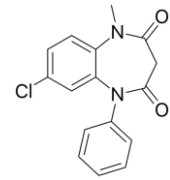
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
	X		X	X				

CLB

Clobazam

CHEMICAL STRUCTURE:



7

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
			X			

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
1	16 hr	85	82	0.03-3	CYP3A, 2C

CZP

Clonazepam

FORMULATIONS:

Tablet: 0.5, 1, 2 mg
Wafer: 0.125, 0.25, 0.5, 1, 2 mg
Solution: 0.5 mg/5 mL

DOSING:

Initial: 0.01-0.03 mg/kg/day, divided BID or TID
Maintenance: 0.1-0.2 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: sedation, confusion, dizziness, ataxia, nystagmus
-Psych: depression
-GI: hypersalivation, dry mouth

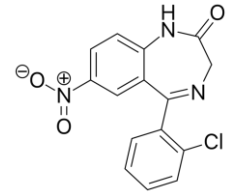
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
			X					

CZP

Clonazepam

CHEMICAL STRUCTURE:



8

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
			X			

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
3	22-33 hr	86	<1%		CYP3A4

DEX

Dexamethasone

FORMULATIONS:

Tablet: 0.5, 0.75, 1, 1.5, 2, 4, 6 mg
IV: 10 mg/mL

DOSING:

Initial: 1-2 mg/kg/day
Maintenance: 0.3-1 mg/kg/day
IV: 1-2 mg/kg/day
Pulse: 5 mg/m^2/day with 7 day taper

COMMON SIDE EFFECTS:

-CV: hypertension
-Endo: weight gain, hyperglycemia, electrolyte imbalance, cushingoid features
-Psych: irritability
-Other: gastritis, infection

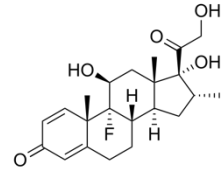
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets

DEX

Dexamethasone

CHEMICAL STRUCTURE:



9

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
			X			

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
	2-9 hr		10%		

ESL

Eslicarbazepine

FORMULATIONS:

Tablet: 200, 400, 600, 800 mg

DOSING:

Initial Dose: 200-400 mg daily
Maintenance: 400-1200 mg daily

COMMON SIDE EFFECTS:

-Neuro: dizziness, headache, somnolence, tremor, blurred vision
-GI: nausea, vomiting, diarrhea
-Other: hyponatremia, rash

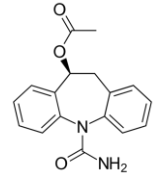
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
	X		X	X				

ESL

Eslicarbazepine

CHEMICAL STRUCTURE:



10

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
X						

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
2.7	10-16 hr	<40%	>90%		UGT

ESM

Ethosuximide

FORMULATIONS:

Capsule: 250 mg
Solution: 250 mg/5 mL

DOSING:

Initial: 10-15 mg/kg/day, divided BID or TID
Maintenance: 20-60 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: drowsiness, headaches
-GI: abdominal pain, vomiting, diarrhea

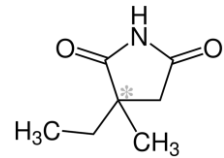
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
X	X	X		X	X			

ESM

Ethosuximide

CHEMICAL STRUCTURE:



11

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
		X				

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.7	30 hr	0	20	40-100	CYP3A

FBM

Felbamate

FORMULATIONS:

Tablet: 400, 600 mg
Solution: 600 mg/5 mL

DOSING:

Initial: 10 mg/kg/day, divided BID or TID
Maintenance: 30-100 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: dizziness, somnolence, headache
-Psych: irritability
-GI: nausea, vomiting, anorexia

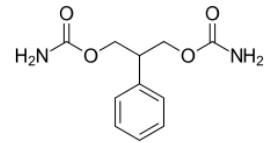
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
X		X	X	X				

FBM

Felbamate

CHEMICAL STRUCTURE:



12

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
			X			

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.91	20-23 hr	25	50	30-60	CYP2E, 3A; UGT

FEN

Fenfluramine

FORMULATIONS:

Solution: 2.2 mg/mL

DOSING:

Initial: 0.2 mg/kg/day, divided BID
Maintenance: 0.2-0.7 mg/kg/day, divided BID (max daily dose of 26 mg)
*Unless on stiripentol and clobazam, can increase up to 0.4 mg/kg/day, divided BID (max daily dose of 17 mg)

COMMON SIDE EFFECTS:

-Neuro: sedation, serotonin syndrome, ataxia
-Psych: suicidal ideation
-GI: decreased appetite, diarrhea, constipation, vomiting
-Other: hypertension, glaucoma

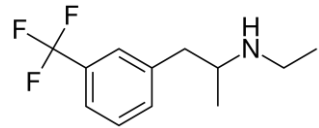
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

Association between fenfluramine with 5-HT2B receptor agonist activity and valvular heart disease and pulmonary arterial hypertension – monitor with TTE prior to starting treatment, during and after treatment

FEN

Fenfluramine

CHEMICAL STRUCTURE:



13

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
						X

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
	15-27 hr	50	90		CYP1A2, 2B6

GBP

Gabapentin

FORMULATIONS:

Capsule: 100, 300, 400 mg
Tablet: 300, 600, 800 mg
Extended release tablet: 300, 600 mg
Solution: 250 mg/5 mL

DOSING:

Initial: 10-15 mg/kg/day, divided TID
Maintenance: 25-100 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: somnolence, dizziness, ataxia, nystagmus, tremor
-Psych: aggressive behavior, emotional lability
-GI: vomiting, diarrhea, anorexia

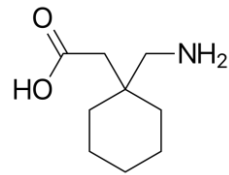
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
				X				

GBP

Gabapentin

CHEMICAL STRUCTURE:



14

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
		X				

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.84	4.7 hr	<3	100	2-20	

KTG

Ketogenic Diet

FORMULATIONS:

Classic Ketogenic Diet
Modified Atkins Diet
Medium Chain Triglycerides Diet
Low Glycemic Index Diet

COMMON SIDE EFFECTS:

-GI: constipation
-Endo: hypoglycemia
-Nepho: metabolic acidosis

SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
						X	X	X

KTG

Ketogenic Diet

15

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
			X	X		X

LCS

Lacosamide

FORMULATIONS:

Tablet: 50, 100, 150, 200 mg
Solution: 10 mg/mL
IV: 200 mg/20 mL

DOSING:

Initial: 1-2 mg/kg/day, divided BID
Maintenance: 5-10 mg/kg/day
IV load: 10 mg/kg
Status: 8 mg/kg

COMMON SIDE EFFECTS:

-Neuro: dizziness, headache, nystagmus, diplopia
-Psych: depression
-GI: nausea, vomiting, flatulence

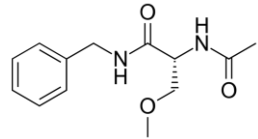
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
				X				

LCS

Lacosamide

CHEMICAL STRUCTURE:



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MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
X						

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.6	7.4-14.8 hr	<15	40	1-10	CYP2C

LTG

Lamotrigine

FORMULATIONS:

Tablet: 25, 50, 100, 150, 200 mg
Extended release tablet: 25, 50, 100, 200, 250, 300 mg
Chew Tablets: 5, 25 mg

DOSING:

Concurrent AED	Week 1-2 mg/kg/day	Week 3-4 mg/kg/day	Usual Maintenance Dose mg/kg/day
EI-AED*	0.6	1.2	5-15
Monotherapy	0.3	0.6	2-8
VPA	0.15	0.3	1-5

* Enzyme-Inducing Anti-Epileptic Drug

COMMON SIDE EFFECTS:

-Neuro: diplopia, dizziness, ataxia, headache, tremor
-Psych: anxiety
-GI: nausea, vomiting, diarrhea

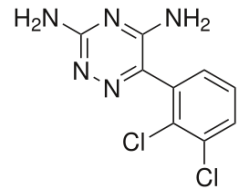
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
	X	X	X					

LTG

Lamotrigine

CHEMICAL STRUCTURE:



17

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
X						

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
1.1	13-27 hr	55	10	2-20	UGT

LEV

Levetiracetam

FORMULATIONS:

Solution 100 mg/mL
Tablet: 250, 500, 750, 1000 mg
Extended release tablet: 500, 750 mg
IV: numerous concentrations

DOSING:

Initial: 20 mg/kg/day, divided BID
Maintenance: 30-60 mg/kg/day
IV load: 20-60 mg/kg
Status dose: 60 mg/kg (max 4500 mg/dose)

COMMON SIDE EFFECTS:

-Neuro: drowsiness
-Psych: agitation, emotional lability, aggression

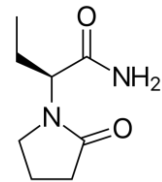
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
								X

LEV

Levetiracetam

CHEMICAL STRUCTURE:



18

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
					X	

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.6	4-7 hr	0	66	15-45	Minimal

NTZ

Nitrazepam

FORMULATIONS:

Tablet: 5, 10 mg

DOSING:

Initial: 0.1-0.2 mg/kg/day
Maintenance: 0.3-1 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: drowsiness, dizziness, ataxia
-Psych: aggression, irritability
-GI: nausea, vomiting

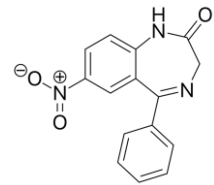
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
X			X	X				

NTZ

Nitrazepam

CHEMICAL STRUCTURE:



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MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
			X			

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
2.4	18-57 hr	87	68	N/A	CYP3A4

OXC

Oxcarbazepine

FORMULATIONS:

Solution: 300 mg/5 mL
Tablet: 150, 300, 600 mg
Extended release tablet: 150, 300, 600 mg

DOSING:

Initial: 10 mg/kg/day, divided BID
Maintenance: 20-60 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: drowsiness, dizziness, vertigo, ataxia, diplopia
-GI: nausea, vomiting
-Nephro: hyponatremia

SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

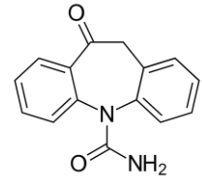
WBC	SJS*	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
X	X	X	X	X		X		X

*HLA-B1502 in Han Chinese population

OXC

Oxcarbazepine

CHEMICAL STRUCTURE:



20

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
X	X	X		X		

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.75	4.8-9.3 hr	40	95	3-35	

PER

Perampanel

FORMULATIONS:

Solution: 0.5 mg/mL
Tablet: 2, 4, 6, 8, 10, 12 mg

DOSING:

Initial: 2 mg daily
Maintenance: 4-12 mg daily

COMMON SIDE EFFECTS:

-Neuro: drowsiness, ataxia, dizziness
-Psych: aggression, irritability

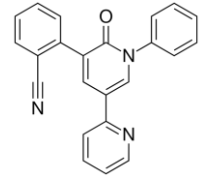
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets

PER

Perampanel

CHEMICAL STRUCTURE:



21

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
				X		

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
1.1	51-129 hr	95	2	200-1000	CYP3A4

PB

Phenobarbital

FORMULATIONS:

Solution: 20 mg/5 mL
Tablet: 15, 16.2, 30, 32.4, 60, 64.8, 97.2, 100 mg
IV: 65 mg/mL, 130 mg/mL

DOSING:

Initial: 5 mg/kg/day, divided BID
Maintenance: 5-8 mg/kg/day
IV load: 15-20 mg/kg
Status: 20 mg/kg (max 300 mg/dose)

COMMON SIDE EFFECTS:

-Neuro: sedation, cognitive impairment
-Psych: hyperactivity, irritability
-Pulm: respiratory suppression

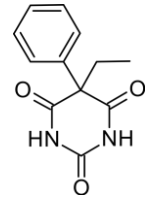
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
X	X	X	X	X	X			X

PB

Phenobarbital

CHEMICAL STRUCTURE:



22

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
		X	X			

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
1.0	60-180 hr	55	25	10-40	CYP2C

PHT

Phenytoin

FORMULATIONS:

Capsule: 30, 100, 200, 300 mg
Tablet: 50 mg
Solution: 125 mg/5 mL
IV: 50 mg/mL

DOSING:

Initial: 5 mg/kg/day, divided BID
Maintenance: 5-10 mg/kg/day
IV load (fosphenytoin): 20 mg/kg
Status (fosphenytoin): 20 PE/kg (max 1500 mg/dose)

COMMON SIDE EFFECTS:

-Neuro: nystagmus, ataxia, cerebellar atrophy
-CV: arrhythmia
-Other: coarse faces, hirsutism, gingival hypertrophy, drug-induced SLE

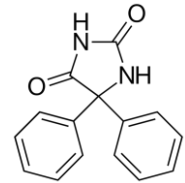
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
X	X	X	X	X	X			X

PHT

Phenytoin

CHEMICAL STRUCTURE:



23

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
X		X				

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.65	7-42 hr	90	5	10-20	CYP2C

PRED

Prednisone

FORMULATIONS:

Solution: 5 mg/5 mL
Tablet: 1, 2.5, 5, 10, 20, 50 mg

DOSING: (infantile spasms)

Week 1-2: 10 mg QID*
* If seizures continue after Week 1, increase to 20 mg TID for Week 2
Week 3-4: wean

COMMON SIDE EFFECTS:

-CV: hypertension
-Endo: weight gain, hyperglycemia, electrolyte imbalance, cushingoid features
-Psych: irritability
-Other: gastritis, infection

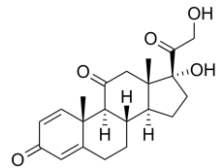
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets

PRED

Prednisone

CHEMICAL STRUCTURE:



24

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
						X

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
	2-3 hr	<50%			

PGB

Pregabalin

FORMULATIONS:

Capsule: 25, 50, 75, 100, 150, 200, 225, 300 mg
Solution: 20 mg/mL
Extended release tablet: 82.5, 165, 300 mg

DOSING:

Initial: 3.5 mg/kg/day, divided BID or TID
Maintenance: 15 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: drowsiness, ataxia, paresthesia
-Psych: euphoric mood, irritability
-GI: vomiting, constipation, dry mouth, increased appetite
-Other: decreased libido

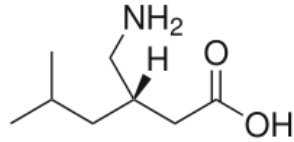
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
X				X				

PGB

Pregabalin

CHEMICAL STRUCTURE:



25

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
		X				

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.57	3-6 hr	0	98		

PRM

Primidone

FORMULATIONS:

Tablet: 50, 250 mg

DOSING:

Age	Days 1-3	Days 4-6	Days 7-9	Maintenance
<8 years	50 mg qhs	50 mg BID	100 mg BID	125 to 250 mg TID
>8 years	100 mg qhs	100 mg BID	100 mg TID	250 mg TID

COMMON SIDE EFFECTS:

-Neuro: drowsiness, cognitive impairment
-Psych: hyperactivity, irritability, depression

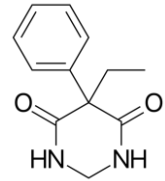
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
	X		X	X				X

PRM

Primidone

CHEMICAL STRUCTURE:



26

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
			X			

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.65	5-16 hr	10	65	5-10	CYP3A4

RFM

Rufinamide

FORMULATIONS:

Suspension: 40 mg/mL
Tablet: 200, 400 mg

DOSING:

Initial: 10 mg/kg/day, divided BID
Maintenance: 45 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: somnolence, dizziness
-GI: nausea, vomiting
-CV: decrease QTc interval
-Other: pyrexia

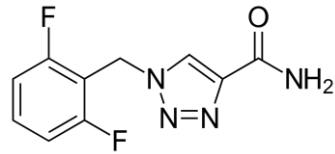
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
			X	X				

RFM

Rufinamide

CHEMICAL STRUCTURE:



27

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
X						

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.9	6-10 hr	35	70	10-40	Carboxylesterase

STP

Stiripentol

FORMULATIONS:

Capsule: 250, 500 mg
Packet: 250, 500 mg

DOSING:

Initial: 10 mg/kg/day, divided BID
Maintenance: 50 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: drowsiness, ataxia, hypotonia, dystonia, hyperkinesia
-Psych: behavior disorder, irritability
-GI: anorexia, nausea, vomiting

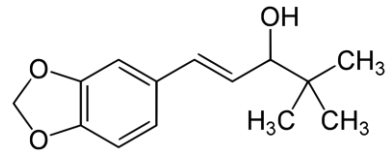
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
				X				

STP

Stiripentol

CHEMICAL STRUCTURE:



28

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
			X			

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
	4.5-13 hr	99	73		CYP1A2, 2C19, 3A4

SUL

Sulthiame

FORMULATIONS:

Tablet: 50, 200 mg

DOSING:

Initial: 5 mg/kg/day, divided BID
Maintenance: 5-20 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: paresthesias, dizziness, diplopia
-Pulm: tachypnea, dyspnea
-CV: tachycardia, chest pain
-GI: loss of appetite

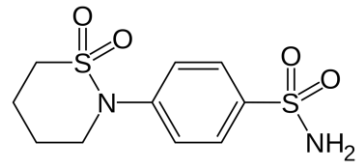
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
	X			X			X	X

SUL

Sulthiame

CHEMICAL STRUCTURE:



29

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
X				X		Carbonic anhydrase inhibitor

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
	5-7 hr	29	85%	1-3	

TGB

Tiagabine

FORMULATIONS:

Tablet 2, 4, 12, 16 mg

DOSING:

Initial: 0.1 mg/kg daily
Maintenance: 0.5-2 mg/kg/day, divided BID

COMMON SIDE EFFECTS:

-Neuro: sedation, tremor
-GI: nausea, vomiting, diarrhea
-Heme: ecchymosis

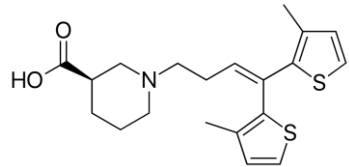
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
				X				

TGB

Tiagabine

CHEMICAL STRUCTURE:



30

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
			X			

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
1.0	7-9 hr	96	25	20-200	CYP3A

TPM

Topiramate

FORMULATIONS:

Tablet: 25, 50, 100, 200 mg
Sprinkle capsule: 15, 25, 50 mg
24-hour ER sprinkle capsule: 25, 50, 100, 150, 200 mg

DOSING:

Initial: 1-3 mg/kg/day, divided daily or BID
Maintenance: 5-10 mg/kg/day, divided BID

COMMON SIDE EFFECTS:

-Neuro: paresthesia, sedation, cognitive slowing
-Endo: decreased serum bicarbonate, weight loss, oligohydrosis
-GI: anorexia

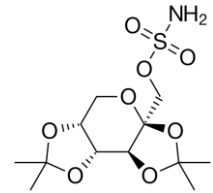
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
				X			X	

TPM

Topiramate

CHEMICAL STRUCTURE:



31

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
X	X	X	X	X		Inhibits carbonic anhydrase

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.7	7-13 hr	15	40%	2-20	

VNS

Vagus nerve stimulator

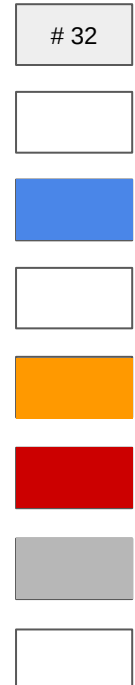
	Normal	Magnet	Autostim
Initial output current	0.25 mA	0.5 mA	0.375 mA
Maintenance output current	1.5-2.25 mA	Normal + 0.25 mA	Normal + 0.125 mA
Frequency	30 Hz		
Pulse Width	500 µsec	500 µsec	500 µsec
ON time	30 sec	60 sec	60sec
OFF time	5 min		
Duty Cycle	10%		

COMMON SIDE EFFECTS:

-Neuro: paresthesias
-ENT: voice change, hoarseness, dysphagia
-Pulm: dyspnea, cough

VNS

Vagus nerve stimulator



VPA

Valproate

FORMULATIONS:

Solution: 250 mg/5 mL
Capsule: 250 mg
Delayed release sprinkle capsule: 125 mg
Delayed release tablet: 125, 250, 500 mg
Extended release tablet: 250, 500 mg tablet
IV: 100 mg/mL

DOSING:

Initial: 15 mg/kg/day, divided BID for capsule
Maintenance: 30-60 mg/kg/day
*TID dosing for solution, QID for IV
IV load: 15 mg/kg
Status: 30 mg/kg (max 3000 mg/dose)

COMMON SIDE EFFECTS:

-Neuro: tremor, lethargy, acute encephalopathy
-GI: nausea, vomiting, abdominal pain, hyperammonemia
-Other: weight gain, hair loss, thrombocytopenia

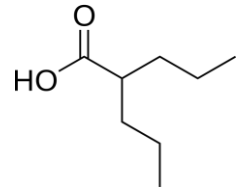
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
X	X	X	X	X	X	X		X

VPA

Valproate

CHEMICAL STRUCTURE:



33

MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
X		X	X			

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.25	9 hr	90	<5	50-100	CYP2C

VGB

Vigabatrin

FORMULATIONS:

Packet: 500 mg
Tablet: 500 mg

DOSING:

Initial: 50 mg/kg/day, divided BID
Maintenance: 150 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: sedation, hypotonia, visual field restriction
-Other: non-specific MRI abnormalities

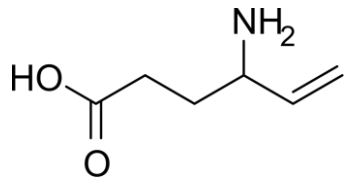
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets

VGB

Vigabatrin

CHEMICAL STRUCTURE:



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MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
			X			

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
0.8	5.5-9.5 hr	0	100	0.8-36 mg/L	

ZNS

Zonisamide

FORMULATIONS:

Capsule: 25, 50, 100 mg

DOSING:

Initial: 2 mg/kg/day, divided BID
Maintenance 4-12 mg/kg/day

COMMON SIDE EFFECTS:

-Neuro: drowsiness, ataxia, dizziness, cognitive slowing
-GI: anorexia
-Nephro: nephrolithiasis, metabolic acidosis
-Other: hypohydrosis

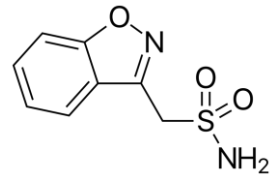
SERIOUS IDIOSYNCRATIC SIDE EFFECTS:

WBC	SJS	Anemia	Hepatitis	Dermatitis	Serum Sickness	Pancreatitis	Kidney Stones	Bone Mets
X	X	X		X			X	

ZNS

Zonisamide

CHEMICAL STRUCTURE:



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MECHANISM OF ACTION:

Na Channel	Increase K Channel	Reduce VS Ca	Increase GABA	Reduce Glut	Bind SV2A	Other
X		X	X	X		Inhibits carbonic anhydrase

PHARMACOKINETICS:

Vd	T 1/2	% Protein	% Renal	Levels	Hepatic
1.5	50-68 hr	40	65	10-40	CYP3A4