



Let's Talk About Brain Health and Rescue Therapies in Epilepsy

This activity is jointly provided by Medical Education Resources and CMEology.

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Learning Objectives

- Describe how to help adults with epilepsy optimize their brain health
- Assess the need for a seizure rescue therapy and provide treatment options
- Describe efficient ways to integrate brain health, rescue therapies, and seizure action plans into practice

Brain Health Is for Everyone

Every person can aspire to have a healthier brain

— *including people living with neurological conditions like epilepsy*



What is Brain Health in Epilepsy?

“A continuous state of attaining and maintaining optimal neurologic function that best supports one’s physical, mental, and social well-being through every stage of life.”

American Academy of Neurology, 2023

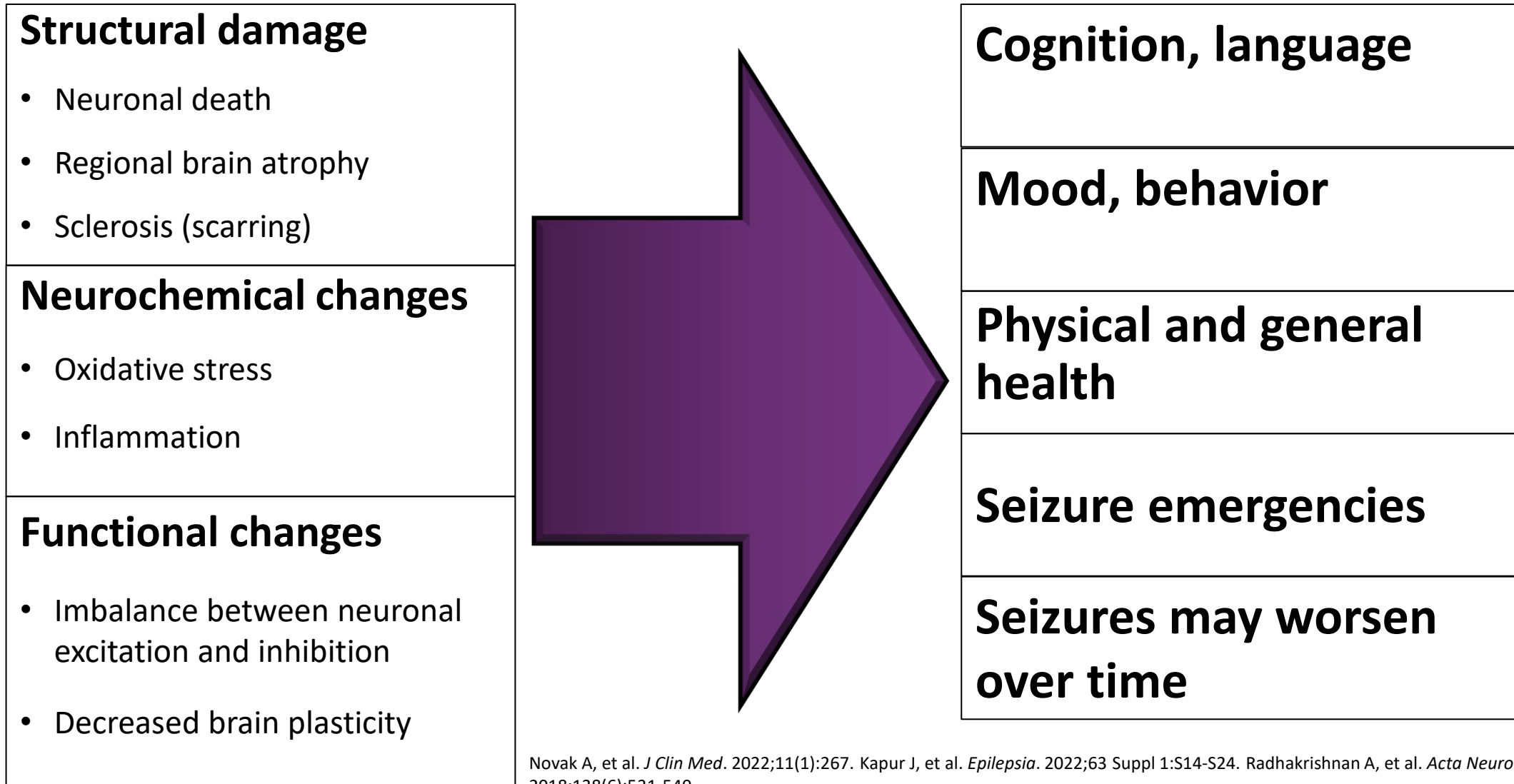
What is Brain Health in Epilepsy?

In epilepsy, brain health can be affected by seizures — or by the underlying cause of epilepsy



- Intermittently
 - During or after the seizure
 - Symptoms can last variable lengths of time
- Chronically
 - Can lead to 'fixed,' long-lasting problems

How Recurrent Seizures/Epilepsy Can Impact Brain Health



Novak A, et al. *J Clin Med*. 2022;11(1):267. Kapur J, et al. *Epilepsia*. 2022;63 Suppl 1:S14-S24. Radhakrishnan A, et al. *Acta Neurol Scand*. 2018;138(6):531-540.

Other Risks of Seizures and Epilepsy



- Disruption of daily activities
- Emotional stress, family stress
- Physical injury
- Loss of independence and “control”
- Fatigue, sleep disturbances
- Hormonal disorders
- Emergency dept. visits, hospitalizations
- Lost time at work or school
- School and learning challenges
- Higher rates of unemployment, underemployment
- Changes in social relationships, isolation
- Stigma
- Increased direct health care costs and indirect costs

Early death – Sudden Unexpected Death in Epilepsy (SUDEP) or death due to complications from seizures

Laxer KD, et al. *Epilepsy Behav.* 2014;37:59-70.
Sazgar M, et al. *Epilepsy Curr.* 2024;24:79-83.
Harden C, et al. *Neurology.* 2017;88(17):1674-1680.
Jafarpour S, et al. *Seizure.* 2019;68:9-15.
Cramer JA, et al. *Epilepsy Behav.* 2014;31:356-362.
De Souza JL, et al. *Neurol Res Inst.* 2018;4140508.
Asadi-Pooya AA, et al. *Lancet.* 2023;402(10399):412-424.

“Time is Brain”: Reducing the Impact of Seizures

- **STOP seizures as quickly as possible**
- Benzodiazepine medications are first-line for seizure emergencies
- Delays in benzodiazepine administration are common and can be associated with
 - Longer seizures that can be difficult to stop
 - Physical injury
 - Neuronal damage
 - Death
 - More ED visits and healthcare utilization
 - Higher costs



Time is Brain

It's Not Enough to Just Ask About Number of Seizures

Talk about risks to brain health



- **Ask** patient or care partner:
 - “What happens when you have a seizure? After a seizure? How long does this last?”
 - “What changes have you noticed in your thinking or mood?”
 - “How have your daily activities changed?”
 - “How has your sleep, walking, exercise, sexual health changed?”
 - “What worries you?”
 - “What do you wish was possible or different?”

How to Reduce The Risks of Epilepsy

Goals

- Get the best seizure control possible
- Reduce the amount of time that the brain spends in a seizure state
- STOP SEIZURES QUICKLY, when they happen
- Focus on brain health — manage the short- and long-term risks of epilepsy



Interventions

- Optimize antiseizure medications (daily)
- Rescue therapies
- Surgical options, neuromodulation devices
- Dietary therapy

Support brain health

- Manage other chronic health conditions
- Actively encourage healthy lifestyle, safety, social connections
- Strengthen and support emotional health
- Explore non-medical approaches to wellness

Becker DA, et al. *Neurol Ther.* 2023;12(5):1439-1455.

Asadi-Pooya AA, et al. *Lancet.* 2023;402(10399):412-424.

Gaitatzis A, et al. *Seizure.* 2023;107:136-145.

Improve Patient Visits and Efficiency

Before the visit	Patient/care partner: bring seizure diary, list of questions and medications, seizure action plan HCP: rapid chart review <ul style="list-style-type: none">• What are the patient's risk factors?• Does the patient need or have a rescue therapy ?• Does the patient have an updated seizure action plan?
Medication reconciliation	HCP: review all medications, when rescue therapy last used (if used at all)
History and physical	Patient/care partner: share needs, what happens during seizure, risks/consequences of seizures, comorbidities HCP: ask about comorbidities, risk factors, seizure-related injuries, daily habits, seizure control, seizure clusters or long seizures, response to rescue therapy

Improve Patient Visits and Efficiency

<p>Assessment</p>	<p>Patient/care partner: share needs/preferences, ask about treatment options</p> <p>HCP: “<i>Should this patient be offered a rescue therapy?</i>”</p> <ul style="list-style-type: none"> • If yes, shared decision-making re: type of rescue therapy • If no, or patient/care partner declines, consider again later • If patient/care partner needs more time, prescribe “homework” on rescue therapies <ul style="list-style-type: none"> ○ Consider follow-up call or telehealth visit with HCP or team member • If patient already has a rescue therapy, has it been used? <p>HCP: “<i>Do they have a current seizure action plan?</i>”</p>
<p>Plan</p>	<p>Patient/care partner and HCP create —or update— seizure action plan</p>
<p>Education</p> <p>Follow-up visit (clinic or telehealth)</p>	<p>Patient/care partner: ask about seizure action plan and treatment, ways to improve brain health</p> <p>HCP: explain/show how to administer rescue therapy, share seizure action plan, educate others</p>

What is a Rescue Therapy?

- FDA-approved rescue therapies are benzodiazepine medications
- Intended for out-of-hospital use by non-medical people
- Used 'prn' (as needed) to stop periods of increased seizures, seizure clusters, or seizures that last longer than usual
- Intended to be used immediately when a seizure event occurs
- Used to prevent seizure emergencies (eg, status epilepticus)
- Does not take the place of daily antiseizure medications or emergency care

FDA-approved Rescue Therapies

Intranasal

- Diazepam nasal spray (Valtoco)
- Midazolam nasal spray (Nayzilam)

Rectal

- Diazepam rectal gel (Diastat AcuDial)

- Route may vary by age
- Most patients and care partners prefer intranasal over rectal benzodiazepine administration
- Other investigational rescue medications are in development

Peters JM, et al. *Patient Prefer Adherence*. 2024;18:383-389.

Becker DA, et al. *Neurol Ther*. 2023;12(5):1439-1455.

Valtoco. Prescribing information. Neurelis; 2025. Accessed Jan 20, 2025. https://www.valtoco.com/sites/default/files/pdf/Prescribing_Information.pdf

Nayzilam. Prescribing information. UCB, Inc; 2025. Accessed Jan 20, 2025. <https://www.ucb-usa.com/nayzilam-prescribing-information.pdf>

Diastat AcuDial. Prescribing information. Bausch Health Companies Inc; 2025. Accessed Jan 20, 2025. <https://www.bauschhealth.com/Portals/25/Pdf/PI/Diastat-PI.pdf>

Potential Benefits of Rescue Therapies

- Increased sense of autonomy/control
- Less disruption in ADLs/get back to life sooner
- Reduce unnecessary ED visits and hospitalizations
- Reduce progression to status epilepticus, which can damage brain cells and be life-threatening
- Lower risk of injury and potential sudden unexpected death in epilepsy (SUDEP)
- Decrease cost of care

Penovich PE, et al. *CNS Drugs*. 2024;38(2):125-140.

Detyniecki K, et al. *Epilepsy Behav*. 2018;88:349-356.

Becker DA, et al. *Neurol Ther*. 2023;12(5):1439-1455.

Penovich P, et al. *Epilepsy Behav*. 2021;121(Pt A):108013.

Nasal Diazepam Spray

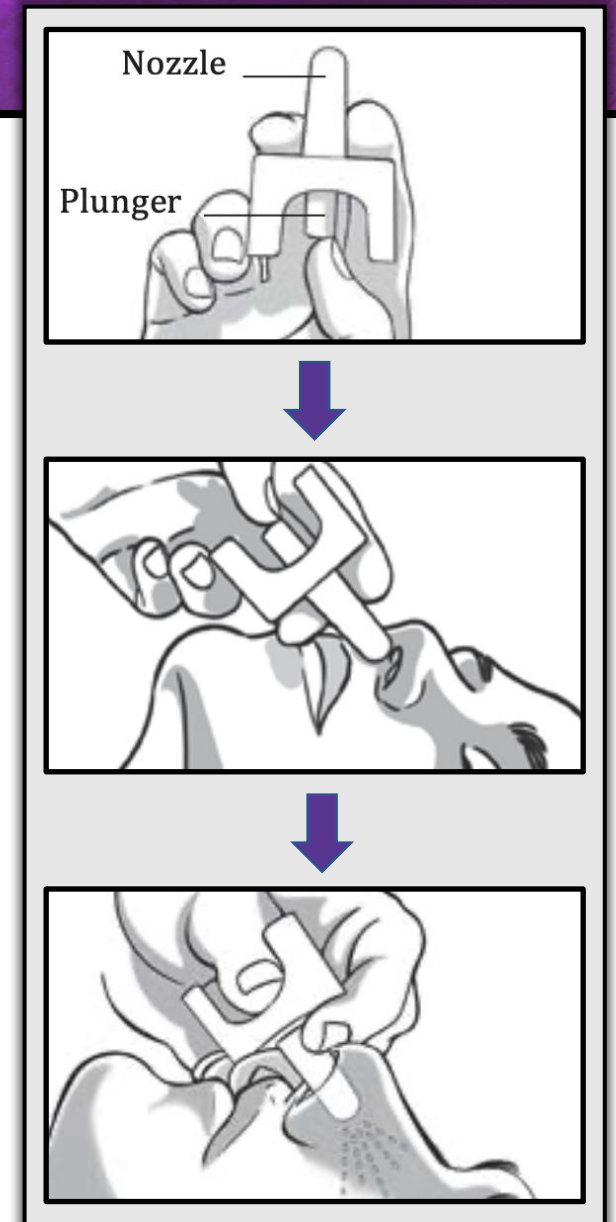
- For the acute treatment of intermittent, stereotypic episodes of frequent seizure activity (ie, seizure clusters, acute repetitive seizures) that are distinct from person's usual seizure pattern
- Age \geq 6 yrs
- Flexible dose based on age and weight
 - 4 dosage strengths: 5, 10, 15, 20 mg
- Each sprayer for one-time use
 - 5, 7.5, or 10 mg in each sprayer
 - One spray into 1 nostril
 - When giving a 15 or 20 mg dose, 2 sprayers are needed — 1 in each nostril
 - Second dose used if needed, at least 4 hours after first dose
- Adverse effects: somnolence, headache, nasal discomfort, change in taste
- 59% return to usual activities within 1 hour

Information and image source: Valtoco. Prescribing information. Neurelis; 2025. Accessed Jan 20, 2025.

https://www.valtoco.com/sites/default/files/pdf/Prescribing_Information.pdf

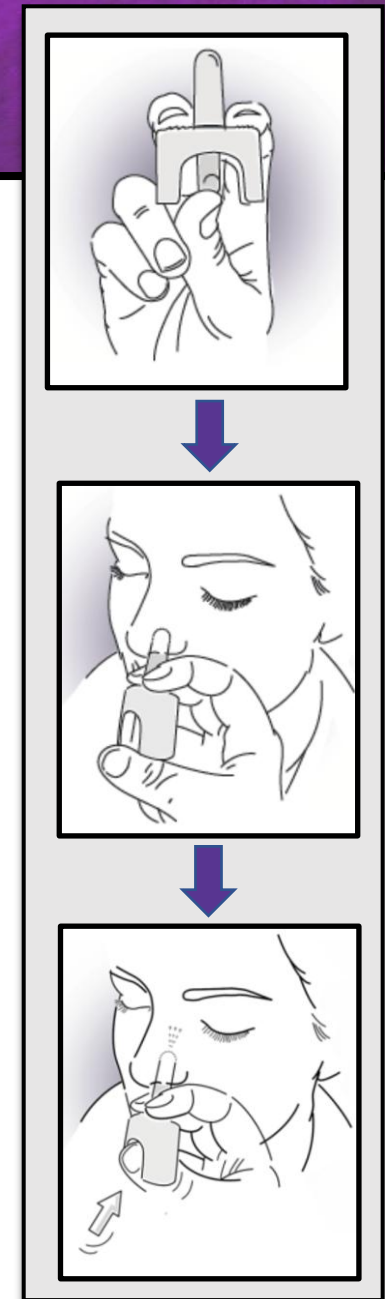
Hogan RE, et al. *Epilepsia*. 2020;61(5):935-943.

Penovich P, et al. *Epilepsy Behav*. 2021;121(Pt A):108013.



Nasal Midazolam Spray

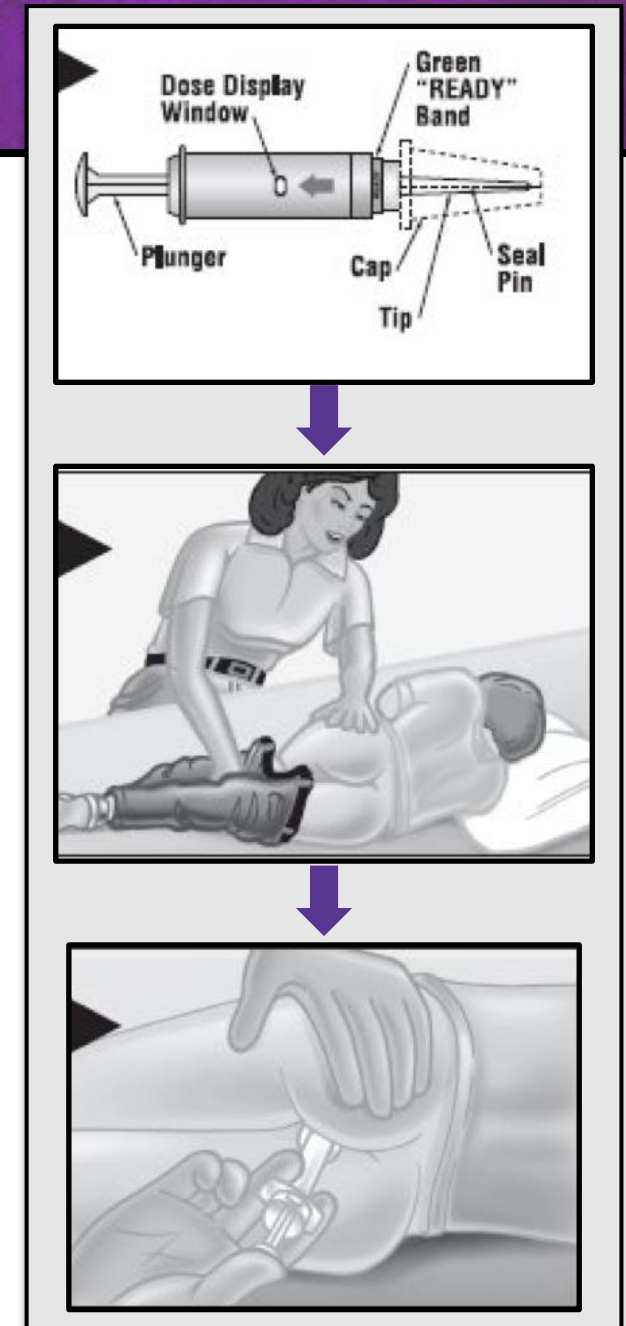
- For the acute treatment of intermittent, stereotypic episodes of frequent seizure activity (ie, seizure clusters, acute repetitive seizures) that are distinct from person's usual seizure pattern
- Age \geq 12 yrs
- Each spray for **one-time** use
 - 5 mg in each sprayer
 - One spray into 1 nostril
 - Second spray used if seizure persists after 10 minutes; use other nostril
- Adverse effects: somnolence, headache, nasal discomfort, throat irritation, rhinorrhea
- Consider test dose in clinic
- Median time to return to normal activities is ~90 minutes



Information and image source: Nayzilam. Prescribing information. UCB, Inc; 2025. Accessed Jan 21, 2025. <https://www.ucb-usa.com/nayzilam-prescribing-information.pdf>
Detyniecki K, et al. *Epilepsy Behav.* 2023;148:109483.

Diazepam Rectal Gel

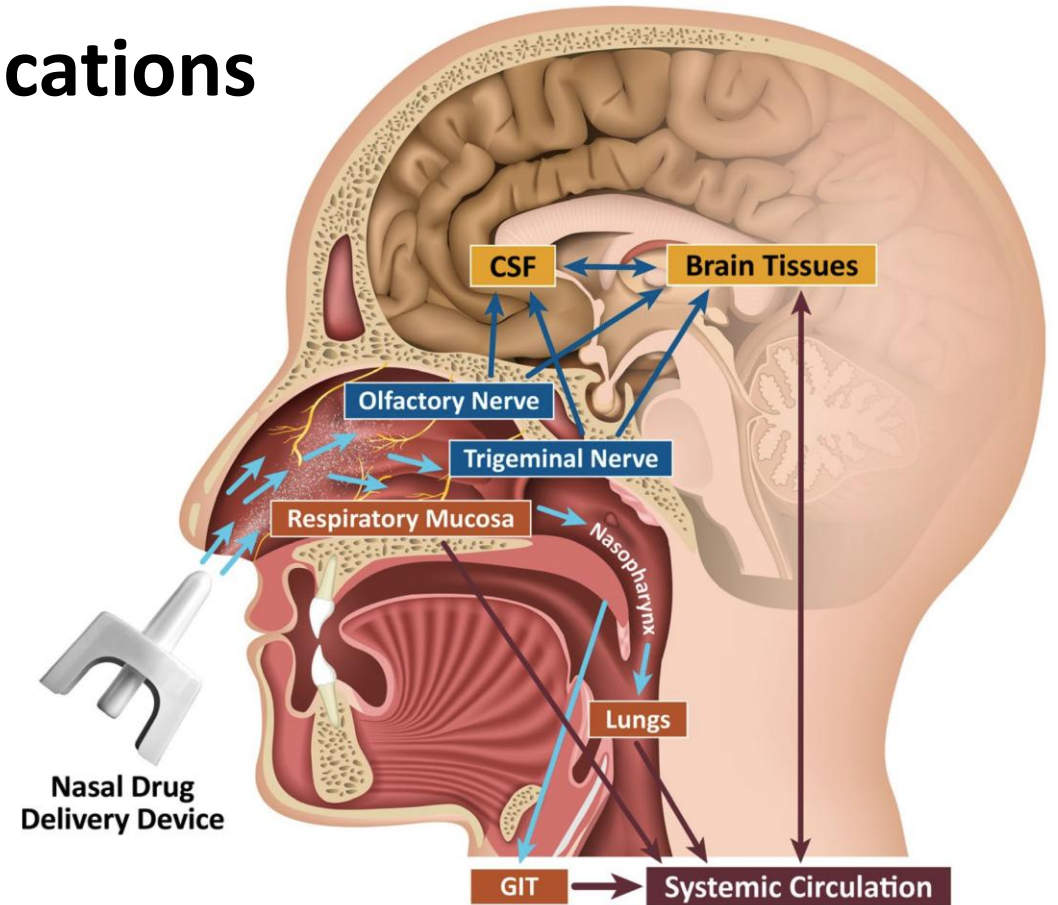
- For acute treatment of intermittent, stereotypic episodes of frequent seizure activity (ie, seizure clusters, acute repetitive seizures) that are distinct from person's usual seizure pattern
- Age \geq 2 yrs
- Flexible dose based on age and weight
- Can give 2nd dose
- Adverse effects: somnolence, headache, diarrhea



Nasally vs Rectally Administered Rescue Medications

Nasally administered rescue medications

- Easier to use
- Faster onset of action
 - Nasal spray: 1 to 5 minutes
 - Rectal gel: 2 to 15 minutes
- Less somnolence



CSF = cerebrospinal fluid; GIT = gastrointestinal tract;

Image source: Cloyd J, et al. *Epilepsia*. 2021;62(4):846-856.

US Food and Drug Administration. Clinical superiority findings. Reviewed June 24, 2021. Accessed Dec 17, 2024. <https://www.fda.gov/industry/designating-orphan-product-drugs-and-biological-products/clinical-superiority-findings>

Gidal B, et al. *Epilepsy Behav*. 2020;112:107391.

Hogan RE, et al. *Epilepsia*. 2020;61(3):455-464.

Valtoco. Prescribing information. Neurelis; 2025. Accessed Jan 20, 2025. https://www.valtoco.com/sites/default/files/pdf/Prescribing_Information.pdf

Nayzilam. Prescribing information. UCB, Inc; 2025. Accessed Jan 20, 2025. <https://www.ucb-usa.com/nayzilam-prescribing-information.pdf>

Diastat AcuDial. Prescribing information. Bausch Health Companies Inc; 2025. Accessed Jan 20, 2025. <https://www.bauschhealth.com/Portals/25/Pdf/PI/Diastat-PI.pdf>

What About Other Benzodiazepine Formulations?



- Medications used off-label in adults

- Not FDA approved as seizure rescue medications for adults

- Sublingual benzodiazepine tablets
- Buccal benzodiazepine tablets or films*
- Compounded forms for intranasal use

- Limitations

- Variable absorption and bioavailability
- Can take longer to start working
- Care partner injury from biting
- Aspiration risk
- Have not been rigorously tested for efficacy or safety for use as rescue therapy in adults



*Diazepam buccal film is FDA approved for the treatment of seizure clusters/acute repetitive seizures in children with epilepsy aged 2 to 5 years.

Libervant (diazepam buccal film). Prescribing information. Aquestive; 2024. Accessed Jan 17, 2025. <https://aquestive.com/content/uploads/libervant-2-to-5-years-of-age-pi-clean-pdf.pdf>

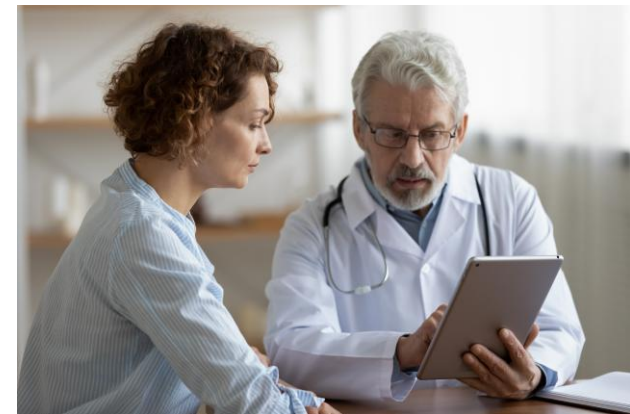
Becker DA, et al. *Neurol Ther.* 2023;12(5):1439-1455.

Who Should Be Assessed For a Rescue Therapy?

- Assess every person with epilepsy for rescue therapy
- Important factors to assess in patient's history
 - Seizure clusters
 - Seizures lasting longer than usual
 - Convulsive seizures lasting > 5 minutes
 - Status epilepticus
 - Needed rescue therapy in past
 - Safety concerns during/after seizure
 - Seen in ED or hospitalized due to seizures

Additional factors to consider:

- Seizures with prolonged aura or warning
- Prior experience
- Ability to self-administer
- Availability of another person to give rescue therapy



Rescue Therapies are Underused

Despite their potential benefits, rescue therapies are underused by patients, families, and care partners

- Only 20% of adults with seizure clusters used rescue medications in a survey of > 500 patients and care partners
- Only 4.2% had a documented rescue therapy in a database review of > 40,000 adults with focal-onset epilepsy

Jafarpour S, et al. *Seizure*. 2019;68:9-15.

Penovich PE, et al. *Neurologist*. 2017;22(6):207-214.

Hatoum HT, et al. *Epilepsia Open*. 2023;8(4):1556-1565.

Patient-related Barriers to Rescue Therapy

People with epilepsy, care partners, and families may

- Not know how to ask HCP about rescue medications
- Not know how seizures affect brain health
- Feel complacent
- Not recognize own seizure risks or need for rescue therapy
- Not know about rescue therapies
- Not have a seizure action plan
- Experience access problems (eg, insurance)

HCP Barriers to Rescue Therapy

- Don't know enough about rescue therapies — unsure who should have one
- Myths and misconceptions about rescue therapy
- Unaware that orally or rectally administered benzodiazepines have limitations
- Communication gap with patients
- Don't know how to create a seizure action plan; lack of process
- Time constraints
- Lack of clinical experience
- Practice differences: specialty center vs. clinic

Dewar S, et al. *The Journal for Nurse Practitioners*. 2023;19:104638.

Penovich PE, et al. *Neurologist*. 2017;22(6):207-214.

Tatum WO, et al. *Epilepsy Behav Rep*. 2023;23:100612.

Written Seizure Action Plans Are Underused

Especially among adults with epilepsy living in the community

- Every person with epilepsy needs a seizure action plan
- HCPs should collaborate with patients/care partners to create a customized seizure action plan

Having a seizure action plan can empower adult patients and care partners

Acute Seizure Action Plan

Name: _____	Birth date: _____	Today's date: _____
Care partner phone numbers: _____	Provider name/facility: _____	Provider phone numbers: _____

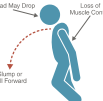

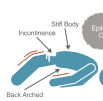
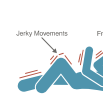
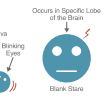






Usual Seizure Pattern

Triggers: _____

Pattern of seizures: _____

Allergies: _____

What the seizures normally look like (Check all that apply)

 Head Nodding	 Loss of Muscle Control	 Occurs Through the Entire Brain	 Stares, usually not their eyes	 Incontinence	 Stiff Body	 Epileptic Copy	 Jerky Movements	 Frothy Saliva	 Blinking Spasms	 Occurs in Specific Lobe of the Brain	Describe: _____
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Atonic seizure (also called drop)
 Absence seizure (also called petit mal)
 Tonic seizure
 Clonic seizure
 Focal impaired awareness seizure (also called complex partial)

NOTES: _____

Care

Standard Care Needed

If this happens, _____ provide standard care

 Time the seizure NOTES: _____	 Keep person safe NOTES: _____	 Don't restrict NOTES: _____	 Stay with person NOTES: _____	 Keep a record NOTES: _____
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Provide Rescue Treatment

If this happens, _____ provide standard care (above) and rescue treatment

<input type="checkbox"/> Rectum	<input type="checkbox"/> Nose	<input type="checkbox"/> Mouth	Specific instructions: _____
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Call for Emergency Help

If any of these happen, _____

<input type="checkbox"/> Seizure longer than _____ minutes	<input type="checkbox"/> Unusual seizure	<input type="checkbox"/> Injury/Blue lips	<input type="checkbox"/> Other: _____
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NOTES: _____

Get help now

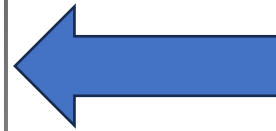
Call Healthcare Provider if: _____
Call for Emergency Help if: _____

NOTES: _____

Healthcare Provider Authorization

Signature: _____ Provider Printed Name: _____ Date: _____ For use from: _____ to: _____

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Available in:

- English
- Spanish



Available in:

- English
- Spanish
- French
- Chinese
- Korean
- Tagalog
- Vietnamese
- Ukrainian

SEIZURE ACTION PLAN (SAP)

Name: _____ Birth Date: _____

Address: _____ Phone: _____

Emergency Contact/Relationship _____ Phone: _____

Seizure Information

Seizure Type	How Long It Lasts	How Often	What Happens

How to respond to a seizure (check all that apply)

- | | |
|---|--|
| <input type="checkbox"/> First aid – Stay, Safe, Side. | <input type="checkbox"/> Notify emergency contact at _____ |
| <input type="checkbox"/> Give rescue therapy according to SAP | <input type="checkbox"/> Call 911 for transport to _____ |
| <input type="checkbox"/> Notify emergency contact | <input type="checkbox"/> Other _____ |

First aid for any seizure

- STAY** calm, keep calm, **begin timing seizure**
- Keep me **SAFE** – remove harmful objects, don't restrain, protect head
- SIDE** – turn on side if not awake, keep airway clear, don't put objects in mouth
- STAY** until recovered from seizure
- Swipe magnet for VNS
- Write down what happens _____
- Other _____

When to call 911

- Seizure with loss of consciousness longer than 5 minutes, not responding to rescue med if available
- Repeated seizures longer than 10 minutes, no recovery between them, not responding to rescue med if available
- Difficulty breathing after seizure
- Serious injury occurs or suspected, seizure in water

When to call your provider first

- Change in seizure type, number or pattern
- Person does not return to usual behavior (i.e., confused for a long period)
- First time seizure that stops on its' own
- Other medical problems or pregnancy need to be checked

When rescue therapy may be needed:

WHEN AND WHAT TO DO

If seizure (cluster, # or length) _____

Name of Med/Rx _____ How much to give (dose) _____

How to give _____

If seizure (cluster, # or length) _____

Name of Med/Rx _____ How much to give (dose) _____

How to give _____

If seizure (cluster, # or length) _____

Name of Med/Rx _____ How much to give (dose) _____

How to give _____

Streamline Action Plan Process to Maximize Impact

- Build seizure action plans into workflow
- Use standardized templates
- Pre-populate forms with EHR data
- Use as a patient education and communication tool — patient can start seizure action plan at home or via telehealth
- Can be done during, after visit, or via telehealth
- Make part of printed after-visit summary
- Let patients access seizure action plan through patient portal
- Make seizure action plans shareable with other HCPs

How to Help Them Feel More Empowered

- Talk about brain health!
- Together, identify risks and consequences of seizures
- Assess every person with epilepsy for seizure rescue therapy
- Educate about rescue therapy options and seizure action plans
- Integrate rescue therapies and seizure action plans into visits
- Connect patients and families to support and advocacy groups

Provide Resources

Conversations About Epilepsy

- <https://www.conversationsaboutepilepsy.org>

Seizure Action Plan Coalition

- Resources and education about seizure action plans
 - <https://seizureactionplans.org>

Other online resources for HCPs and patients/care partners

- Epilepsy Foundation
 - <https://www.epilepsy.com>
- Epilepsy Alliance America
 - <https://www.epilepsyallianceamerica.org>