Pain Management: Gabapentin

After completion the learner should be able to:
1. Identify appropriate indications for use of gabapentin.
2. Relate general characteristics of gabapentin to specific patient situations.
3. Apply nursing process considerations for gabapentin to specific patient situations.
4. Correctly calculate dosage for gabapentin.

Gabapentin (Neurontin) is an older GABA analogue, approved by the FDA for use in 1993. Others include:
- Gabapentin: Gralise, approved in 2011 for treatment of postherpetic neuralgia

It is important to note that different forms of the GABA analogues are not interchangeable with regard to indications, dosage, or other characteristics. For example, the two brands of gabapentin, Neurontin and Gralise, have different dosage schedules and indications, despite the same generic name. Neurontin is indicated for treatment of partial onset seizures, but Gralise is not. This newsletter will focus on Neurontin as an example of the GABA analogues, and its role in pain management.

Indications
Neurontin is indicated for the treatment of postherpetic neuralgia in adults and partial onset seizures in patients 3 years and older.

Pharmacodynamics
Neurontin acts by binding to selected calcium channels in the central nervous system. This inhibits the release of neurotransmitters that cause excitation.

Pharmacokinetics

Aborption: Fairly low absorption; with bioavailability decreasing as the dose increases; may be taken without regard to food
Distribution: Widely distributed in tissues; very low protein binding
Metabolism: Does not undergo metabolism
Elimination: Excreted as unchanged drug by the kidneys

Major Interactions
Opioids and other CNS depressants: In 2019, the FDA issued a warning that concurrent use of gabapentinoids and opioids may result in serious respiratory depression and death.

Aluminum/magnesium hydroxides (Maalox): concurrent use may significantly decrease the bioavailability of Neurontin; these drugs should be taken at least two hours apart.

Because there is no significant protein binding or drug metabolism, Neurontin has little to no interaction with most other drugs.

Adverse Effects/Toxicity
Angioedema and severe hypersensitivity reactions may occur. The drug should be discontinued immediately and the physician notified if there is swelling of the lips, tongue, neck or face, or if rash, hives, blisters, itching or wheezing occur. Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS, or multi-organ hypersensitivity) has also been reported, with symptoms such as rash, fever and enlarged lymph nodes. These signs should be evaluated immediately and the drug discontinued if no other cause is found.
Risk for respiratory depression is increased with use of opioids, and in patients who are elderly or have underlying respiratory conditions. Other adverse effects include drowsiness, dizziness, impaired balance, nausea/vomiting, and peripheral edema. There is also risk for suicidal thoughts/behavior with gabapentinoids. Abrupt discontinuation may cause insomnia, anxiety, increased pain, tachycardia, and sweating. Patients taking Neurontin for seizures may have increased seizure activity if the drug is discontinued suddenly.

Precautions/Contraindications

Patients with impaired renal function may require a reduced dosage. Patients with a history of angioedema caused by other drugs should be monitored carefully. Fall precautions should be used until drug effects are known.

Nursing Process

Assessment

Determine baseline status: A thorough assessment of the patient’s pain due to postherpetic neuralgia should be documented prior to the start of therapy. It is important to use the standardized method of pain assessment, such as a recognized, patient-oriented pain rating scale, used throughout the facility. Use of a standardized scale provides a common means of communication about pain, assessment of intensity, and baseline of comparison for the patient, nurse and other members of the healthcare team.

In assessing, evaluating and documenting pain, it is also important to include objective and subjective findings. Objective findings associated with physiologic responses to pain should be noted. Observation of a localized area of pain should include assessment for redness, discoloration, swelling, temperature or any other abnormality. Observe the patient for any guarding or protecting of particular areas of the body and check for range of motion if extremities are involved. Note the patient’s mood and facial expression. Subjective information should include the patient’s description of the pain, including location, duration, quality, aggravating factors and associated symptoms such as nausea, vomiting or itching. In addition, question the patient regarding past experiences with similar pain and any measures that have been helpful in relieving the pain. Also monitor the patient for signs of depression or anxiety, common in patients suffering from chronic pain.

Identify risk factors: Assess renal lab work for impaired renal function. Identify and closely monitor patients having a history of angioedema with other drugs. Monitor closely for respiratory depression in at-risk patients.

Age-specific considerations: Neurontin should be used during pregnancy only if the risks outweigh the benefits. It is not known to be hazardous to the nursing infant and is considered “probably compatible” with breastfeeding. It is approved for use in children age 3 years and older only for seizure treatment. It is generally well-tolerated in the elderly population, with careful attention to the higher rate of renal impairment and risk of falls in this group.

Planning and Analysis

The goals of therapy with use of Neurontin for postherpetic neuralgia are to reduce the patient’s perception of pain, increase comfort and function, and improve quality of life.

Intervention

Medication administration: Neurontin is administered orally as capsules, tablets, or oral solution. It is usually taken in three divided doses daily, and may be taken with or without food.

Observe for therapeutic effects: Pain relief usually occurs within 2–4 weeks. Assess the patient’s pain periodically for improvement, comparing it to baseline scores.

Observe for adverse effects: Monitor the patient for angioedema, hypersensitivity reactions, edema, dizziness, drowsiness, and suicide risk. Implement fall precautions.

Patient/Family teaching:

- Keep all appointments and take the drug as prescribed, at the same times each day.
- This drug does not result in immediate pain relief; effects may take 2-4 weeks.
- Stop taking the drug and seek immediate medical attention if any of the following occur: swelling of the face, mouth or neck, rash, hives, blisters, itching, wheezing, fever, or lymph node enlargement.
- Except as noted above, do not stop taking the drug abruptly, as side effects may occur; contact your doctor for advice regarding discontinuing the drug.
- Notify your doctor promptly for suicidal thoughts or other personality changes.
- Use care to avoid falls when standing or moving, as dizziness may occur. Do not drive or operate machinery until drug effects are known.
- Do not take opioid pain medication unless closely monitored by your doctor.
- Avoid use of alcohol or sedating drugs, as dizziness, drowsiness, or confusion may occur or be worsened.
- Do not take any new prescription or over-the-counter drugs before talking with your doctor.

Evaluation

The nurse promotes safe and effective relief of pain through assessment, patient education, and monitoring for therapeutic and adverse effects of gabapentin.
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Directions: Place the letter of the one best answer in the space provided.

1. An important function of GABA in the central nervous system is to:
   A. inhibit transmission of nerve impulses
   B. regulate circadian rhythm to promote wakefulness
   C. trigger the “fight or flight” response
   D. promote rapid and effective communication between neurons

2. The GABA analogue drugs can be used interchangeably with regard to indications and dosage.
   A. True
   B. False

3. Gabapentin (Neurontin) is indicated for the treatment of:
   A. fibromyalgia and restless leg syndrome
   B. partial onset seizures and postherpetic neuralgia
   C. diabetic neuropathy and partial onset seizures
   D. postherpetic neuralgia and fibromyalgia

4. Neurontin has very few interactions with other drugs because it:
   A. has fairly low bioavailability
   B. remains in the circulation and does not distribute into body tissues
   C. does not cross the placenta and is not excreted in breast milk
   D. does not bind to protein or undergo drug metabolism

5. In 2019, the FDA issued which of the following warnings regarding use of gabapentinoids:
   A. reducing the dosage for patients with renal impairment
   B. abrupt discontinuation may result in increased seizure activity
   C. increased risk of falls in the elderly
   D. risk of respiratory depression when used with opioids
6. Which of the following patients is at highest risk for serious adverse effects of Neurontin:
   A. 32-year old nursing mother
   B. 60-year old woman with hypertension
   C. 75-year old man with emphysema
   D. 49-year old man who is immunocompromised

7. Abrupt discontinuation of Neurontin is likely to cause:
   A. sweating
   B. drowsiness
   C. bradycardia
   D. all of the above

8. Mr. Gregg began taking Neurontin one week ago for nerve pain. He calls the office to say that the drug is not working, as it has had no effect on his pain. The nurse appropriately responds by:
   A. informing the physician, and suggesting that another drug be prescribed
   B. asking Mr. Gregg if he is taking one of the doses at bedtime
   C. telling Mr. Gregg that the drug may take 2-4 weeks to have an effect
   D. reminding Mr. Gregg that the drug can be used “as needed,” and to take it as soon as he notices pain

9. Instructions for a patient starting to take Neurontin should include which of the following:
   A. “Make sure to take your daily doses with food.”
   B. “Normal side effects include nausea, rash and fever—these will go away.”
   C. “You may experience some weight loss at first.”
   D. “Change positions slowly at first and be careful to avoid falls.”

10. Drug order: Gabapentin (Neurontin) solution 400 mg PO three times daily
    Drug label: Gabapentin (Neurontin) solution 250 mg per 5 ml
        Give:
        A. 3 ml
        B. 8 ml
        C. 12.25 ml
        D. 18.6 ml
## Group Tracking Log

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Peak Development Resources©
Contact Hour Application for Medication Administration

PLEASE COMPLETE EACH SECTION LEGIBLY. INCOMPLETE APPLICATIONS CANNOT BE PROCESSED.

1. Issue:  Pain Management: Gabapentin
   Month:  October 2021

2. Facility Information
   (provide information about the subscribing facility):
   Facility Name: ________________________________
   Address: ____________________________________
   City: __________ State: _____ Zip: ______

3. Applicant Information
   (provide information about yourself)
   Name: _________________________________
   Address: _________________________________________
   City: __________ State: _____ Zip: ______
   Daytime Phone Number:_______________________
   Nursing License #: ________________________
   Licensing State: __________________________
   Previous Peak Development Contact Hours: Yes  No

4. Test Answers: Darken the appropriate circle below to answer each test question.

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5. Contact Hour Information:
   One contact hour is awarded for each test grade of 70% or higher from an issue of Peak Development for Medication Administration. The applicant must be an employee of a subscribing institution. The application fee is nonrefundable, regardless of test grade.

6. PAYMENT INFORMATION:
   APPLICATIONS MUST INCLUDE PAYMENT
   Cost: $10 per test — nonrefundable
   Check Payment method - Provide all information
   ______ Check Payable to Peak Development Resources
   ($40.00 service fee for returned checks)
   ______ Credit Card (circle one):
   VISA                  MASTERCARD
   Credit Card Number: ____________________________
   Credit Card Expiration Date: ___________
   Print Name on Card: ____________________________
   Authorized Signature: ____________________________
   Billing Address for credit card:
   Address: _________________________________________
   State: _____ Zip: ______

7. EVALUATION
   A. How long, in minutes, did it take you to complete this educational packet? _______ minutes.
   B. Please rate each of the following categories by circling the number that best reflects your experience with this self-study packet:
      1=Strongly agree
      2=Agree
      3=Disagree
      4=Strongly disagree

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8. Mail completed application and payment to:
   Peak Development Resources, LLC
   P.O. Box 13267
   Richmond, VA  23225