Unit 10: SEIZURE DISORDERS

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Seizure Disorders

DEFINITION

a. Seizure

- A seizure, characterized by a temporary surge of electrical activity in the brain causing uncontrollable firing of signals among brain cells, can induce changes in behavior, movements, feelings, and consciousness levels. These episodes result from excessive electrical discharges in specific brain cell groups and can vary widely in severity, duration, and frequency. Seizures are categorized into provoked seizures, occurring due to other conditions or circumstances such as high fevers, alcohol or drug withdrawal, or low blood sugar, accounting for about 25% to 30% of all seizures, and unprovoked seizures, which occur independently of current medical conditions or circumstances, including those that manifest more than seven days after a specific cause like head injury or stroke, indicating a greater susceptibility of the brain to produce spontaneous seizures.

b. Seizure Disorders

- Epilepsy, a chronic neurological condition characterized by recurrent seizures, is diagnosed when an individual experiences at least two unprovoked seizures at different times, with a single seizure not indicative of the disorder. Dating back to 4000 BCE, epilepsy has a longstanding history, marred by fear, misconceptions, prejudice, and societal stigma that persist across centuries and nations. This stigma poses significant challenges to the well-being of individuals living with epilepsy and their families, emphasizing the importance of raising awareness and fostering understanding about the condition.

ETIOLOGY

a. Seizure Disorders

- Epilepsy, a non-contagious condition, encompasses diverse underlying disease mechanisms, with approximately 50% of cases globally still lacking a definitive cause. These causes span several categories: structural, including brain damage from prenatal or perinatal factors, congenital abnormalities, severe head injury, stroke, and brain tumors; genetic, involving syndromes or genetic changes predisposing to seizures; infectious, such as meningitis, encephalitis, or neurocysticercosis; metabolic, including low blood sodium, medication side effects, substance abuse, and severe illnesses like COVID-19; and potential immune-related causes, though not explicitly outlined, which could involve autoimmune conditions affecting the brain. Additionally, around half of epilepsy cases worldwide remain classified as of unknown etiology, despite the association with various underlying disease mechanisms.

- Disruptions in the communication pathways of neurons in the brain can lead to seizures, with epilepsy being a common cause alongside various other factors such as infections, genetic conditions, metabolic disturbances, and substance abuse. Seizures can be triggered by multiple factors, including elevated body temperature, infections affecting the brain like meningitis, severe overall illness such as that seen in conditions like COVID-19, insufficient sleep, decreased sodium levels in the blood, certain medications used for pain management or depression, recent brain injury such as head trauma, use of legal or illegal drugs like amphetamines or cocaine, and misuse of alcohol, particularly during withdrawal or severe intoxication periods.

PREVALENCE & INCIDENCE

Locally	*Internationally*
● In the Philippines, the prevalence of epilepsy ranges between 330 and 380 cases per 100,000 people, affecting approximately 0.9% of the population. ● The estimated number of individuals living with epilepsy in the Philippines is around 750,000. ● There are only 20 epileptologists in the Philippines, resulting in one epileptologist for every 45,000 patients	● Epilepsy affects approximately 50 million people worldwide, representing 0.5% of the global burden of disease. ● The estimated prevalence of active epilepsy globally ranges from 4 to 10 cases per 1000 people. ● Annually, around 5 million new cases of epilepsy are diagnosed worldwide.

with epilepsy. ● Approximately 75% of people living with epilepsy in low-income countries, including the Philippines, do not receive the necessary treatment. ● The risk of premature death among individuals with epilepsy in low-income countries is up to three times higher than that of the general population. ● About 25% of patients with epilepsy in the Philippines have intractable seizures that require multiple antiseizure medications (ASMs) for control.	● In high-income countries, the annual incidence rate is approximately 49 per 100,000 people, while in low- and middle-income countries, it can be as high as 139 per 100,000 people. ● Approximately 80% of individuals with epilepsy reside in low- and middle-income countries. ● Seizures are the most common acute neurologic problem in the United States, with an age-adjusted incidence rate of 44 per 100,000 person-years.

SIGNS, SYMPTOMS, PATHOMECHANICS (A. Dental Conditions)

Manifestations that the **Physician/Allied Health Professional** Perceive	● **Electroencephalogram (EEG)** - Electroencephalogram (EEG) findings can monitor brain activity during seizures. Physicians/allied health medical professionals can see abnormal electrical patterns which may help in providing diagnostic information. ● **Physical Signs** - Physicians and allied health professionals may observe physical signs as well such as: involuntary movements, loss of consciousness, postictal symptoms. ● **Medical History** - Through the medical history of the patient, medical professionals can gather information such as previous seizures, family history of seizures, medications, and possible triggers. ● **Imaging Tests** - Imaging tests like MRI or CT scans may also reveal structural abnormalities in the brain that

	could be related to the seizure disorder.
Manifestations that the **Parents/Significant Others** Perceive	• **Absence Seizures** - Absence seizures wherein a person may appear to be unresponsive and may blink or have subtle movements. • **Tonic-Clonic Seizures** - Tonic-clonic seizures wherein others may notice the person falling, losing, bladder control, and experiencing tongue biting or foaming at the mouth. • **Focal Seizures** - Focal seizures which often entails repetitive movements, unusual sensations or behaviors, or altered consciousness. • **Behavioral Changes**
Manifestations that the **Patient** Experiences	• **Tonic-clonic Seizures** - Tonic-clonic seizures, characterized by three distinct phases, begin with the tonic phase, during which the individual loses consciousness and experiences muscle rigidity lasting approximately 10 to 30 seconds. This phase transitions into the clonic phase, marked by uncontrolled convulsions lasting from 30 to 60 seconds, occasionally extending further. Following the seizure activity, the post-seizure recovery phase ensues, wherein the individual regains consciousness and returns to their pre-seizure state. Common post-seizure symptoms include confusion and muscle aches, indicative of the body's recovery process. • **Absence Seizures** - Absence seizures, most common in children, entail brief periods of staring or blanking out. • **Focal Seizures**

	- Focal seizures manifests through symptoms such as uncontrolled muscle movements that may spread to different places on one side of the body.
Structural & Anatomical Changes	● **Brain** - Brain regions specialized for learning and memory, particularly the neocortical regions and the hippocampus, are comparatively more prone to seizures. ● **Anatomical Changes** - Epilepsy is associated with anatomical changes in the hippocampus, amygdala, frontal cortex, temporal cortex, and olfactory cortex.

POSSIBLE SPEECH-LANGUAGE PROBLEMS ASSOCIATED WITH THE CONDITION

Language	- When epilepsy develops in early childhood, patterns of language areas in the brain may be atypical and language delays and language disorders may emerge. - This may eventually extend to effects on reading and writing. - Adults may have word-finding difficulties. - Problems with language comprehension have also been reported.
Speech	- Speech may be slurred, imprecise, or distorted. - One's speech may be affected with apraxia or dysarthria.
Voice	- There is some evidence suggesting that seizure disorders may contribute to the onset or exacerbation of stuttering in some individuals.

Cognition	- Seizures can impact cognitive processes involved in communication, such as attention, memory, problem-solving, and executive functioning, leading to difficulties in pragmatic language use, discourse comprehension, and social communication.

TYPES, COURSE, & PROGNOSIS

Types	**1. Focal Seizures (Partial Seizures)** Begins with abnormal electrical discharge in one specific area of the brain. Characteristics include how it can spread and cause loss of consciousness (tonic-clonic seizures) and it can affect consciousness, responsiveness, and memory vary. The different types are as follows: a. Temporal Lobe Seizures - Most common type of focal seizure. - Affect memory, emotions, sound interpretation, and language understanding. - Symptoms vary from mild sensations to intense emotions or feelings of déjà vu. - Automatisms (repetitive movements) like lip smacking may occur. b. Frontal Lobe Seizures - Involve movement, decision making, problem-solving, and emotions. - Symptoms may include night waking, thrashing, and cycling movements during sleep. c. Occipital Lobe Seizures - Affect the visual system. - Symptoms may include visual hallucinations of lights or patterns. - Can be mistaken for migraine headaches due to similar symptoms. d. Parietal Lobe Seizures - Involve processing touch, pain, and spatial information. - Less common, but can cause diverse sensory symptoms. **2. Generalized Seizures** Involves both brain hemispheres from the beginning. It is characterized by typically loss of

consciousness and manifestations vary from staring to rhythmic jerking of the body. The different types include:

a. Absence Seizures (Petit Mal)
   - Brief, sudden cessation of movement with staring.
   - Blank stare, "daydreaming" appearance, fluttering eyes, slight jerking movements.
   - Characterized by brief loss of awareness.
   - Duration: Usually up to 15 seconds, may occur multiple times a day.
   - Memory: No recollection of the seizure.

b. Myoclonic Seizures
   - Cause brief, shock-like jerking movements in muscles.
   - Sudden twitching or jerking of the body.
   - Often occurs upon waking up.
   - Often affect both sides of the body simultaneously.
   - Duration: Fraction of a second, multiple seizures can occur in succession.
   - Consciousness: Typically remains awake.

c. Tonic-Clonic Seizures (Grand-mal)
   - Start with stiffening (tonic phase) followed by convulsions (clonic phase).
     - Tonic Stage – Loss of consciousness, body stiffness, may fall to the floor.
     - Clonic Stage – Limbs jerk, loss of bladder or bowel control, potential tongue or cheek biting, breathing difficulties.
   - Involve loss of consciousness and can cause injuries.
   - Duration: Typically stops after a few minutes, but may last longer.
   - Aftermath: Headache, memory difficulty, fatigue, confusion.

d. Atonic Seizures
   - Characterized by sudden loss of muscle tone, leading to collapse and falling to the ground.
   - Also known as "drop attacks" due to the abrupt onset and brief duration.
   - Typically followed by rapid recovery and ability to resume previous activities.

e. Status Epilepticus
   - Medical emergency characterized by prolonged seizure activity or repeated seizures without regaining consciousness in between.
   - Can lead to significant neurological damage, systemic complications, and mortality if not promptly treated.

	f. Progressive Myoclonic Epilepsy - Rare, often due to hereditary metabolic disorders. - Symptoms include seizures, unsteadiness, muscle rigidity, and intellectual disability. g. Reflex Epilepsy - Seizures triggered by specific stimuli like flashing lights or sounds. - Can also be triggered by activities such as reading or thinking about a subject.
Course	Seizure disorder (Epilepsy) prognosis hinges on various factors, including the cause of the initial seizure and the efficacy of treatment. While around 70% of individuals achieve seizure control with antiepileptic drugs, approximately 30% continue to experience seizures despite medication. For those with drug-resistant epilepsy, surgical interventions or neurostimulation techniques may offer alternatives. Moreover, between 60% and 80% of patients may achieve prolonged periods of seizure freedom, either with or without ongoing medication. Certain types of childhood-onset epilepsy have been observed to spontaneously resolve during adolescence, suggesting a favorable prognosis for some individuals. In addition to considering seizure frequency and control, it's essential to address acute and chronic complications associated with epilepsy. Acute complications, such as status epilepticus, demand immediate medical attention due to the risk of life-threatening outcomes. Long-term consequences of prolonged seizures may include neurological deficits and cognitive impairments. Furthermore, epilepsy is linked to a slightly higher mortality risk compared to the general population, primarily due to conditions like sudden unexpected death in epilepsy (SUDEP), accidents during seizures, or status epilepticus. Psychiatric complications, particularly anxiety and depression, are common in individuals with epilepsy and require comprehensive management to improve overall quality of life. Additionally, antiepileptic drugs may contribute to treatment-related complications, such as sexual dysfunction, metabolic disturbances, bone health issues, and cardiovascular problems. Therefore, a holistic approach to epilepsy management, considering both seizure control and the prevention and management of complications, is crucial for optimizing long-term outcomes and quality of life for individuals with epilepsy.

Outcome if Left Treated and/or Untreated	1. **Treated Epilepsy**
	- Controlled Seizures
	  - With appropriate treatment, including medication, surgery, or other interventions, many individuals with epilepsy can achieve good seizure control.
	  - Controlled seizures allow individuals to lead relatively normal lives, with reduced risk of injury and improved quality of life.
	- Improved Quality of Life
	  - Effective seizure management can alleviate symptoms, reduce seizure-related complications, and improve overall well-being.
	  - Treatment may also help address associated comorbidities, such as mood disorders or cognitive impairments.
	- Long-Term Prognosis
	  - With ongoing treatment and regular medical follow-up, individuals with epilepsy can often maintain stable seizure control and lead productive lives.
	  - Periodic reevaluation may be necessary to adjust treatment based on changing needs and response to therapy.
	2. Untreated or Inadequately Treated Epilepsy
	- Continued Seizures
	  - Without proper treatment, seizures are likely to persist or worsen over time, leading to ongoing physical and psychological challenges.
	  - Uncontrolled seizures may increase the risk of injury, accidents, and other adverse outcomes.
	- Decline in Quality of Life
	  - Uncontrolled epilepsy can significantly impact daily functioning, employment, education, relationships, and overall quality of life.
	  - Persistent seizures may contribute to social stigma, isolation, and emotional distress for affected individuals and their families.
	- Increased Risks
	  - Untreated epilepsy carries risks of various complications, including status epilepticus, injuries from falls or accidents during seizures, and cognitive decline.

	- Long-term consequences may include cognitive impairment, mood disorders, and decreased life expectancy - Sudden Unexpected Death in Epilepsy (SUDEP) - Individuals with untreated or poorly controlled epilepsy face a higher risk of SUDEP, a rare but serious complication characterized by sudden death in individuals with epilepsy, often during sleep. - Effective seizure management and adherence to treatment can help reduce the risk of SUDEP and improve overall outcomes.

HEALTHCARE RESOURCES AVAILABLE FOR SEIZURE DISORDERS

Healthcare Resources	
Medical Treatment	● Anti-epileptic drugs (AEDs) are the cornerstone of epilepsy management and can effectively control seizures in many individuals. ● Patients should receive appropriate medical evaluation and ongoing monitoring to determine the most suitable AED regimen based on seizure type, frequency, and individual factors. ● Regular follow-up with neurologists or epilepsy specialists is essential to monitor treatment response, adjust medication as needed, and address any side effects or complications.
Surgical Intervention	● For individuals with drug-resistant epilepsy or seizures originating from a specific area of the brain, surgical options such as brain surgery may be considered. ● Preoperative evaluation, including neuroimaging, electroencephalography (EEG), and neuropsychological testing, helps determine candidacy for surgery and predict outcomes. ● Specialized epilepsy centers offer comprehensive evaluation and surgical interventions, with careful consideration of potential risks and benefits.
Alternative Procedures	● Alternative procedures, such as vagus nerve stimulation (VNS) or deep brain stimulation (DBS), may be explored for patients who are not candidates for surgery or do not achieve adequate

	seizure control with medications alone. ● These procedures involve implanting electrical devices to modulate brain activity and can help reduce seizure frequency and severity.
Dietary Therapy	● Some patients, particularly children with drug-resistant epilepsy, may benefit from dietary therapies such as the ketogenic diet. ● Supervised by healthcare professionals, dietary interventions aim to modify brain metabolism and reduce seizure frequency, often as an adjunct to medication.
Complementary Therapies	● While not substitutes for medical treatment, complementary therapies such as stress-reduction techniques, relaxation therapies, and certain dietary supplements may help manage epilepsy symptoms and improve overall well-being. ● Patients should exercise caution and consult healthcare providers before considering complementary therapies to ensure safety and efficacy.
Multidisciplinary Care	● Epilepsy management often requires a multidisciplinary approach involving neurologists, epileptologists, neurosurgeons, neuropsychologists, dietitians, and other healthcare professionals. ● Collaborative care facilitates comprehensive evaluation, personalized treatment plans, and ongoing support for patients and their families.
Education and Support	● Patients and their caregivers should receive education about epilepsy, including seizure recognition, safety precautions, medication adherence, and lifestyle management. ● Support groups, counseling services, and community resources can provide emotional support, practical guidance, and advocacy for individuals living with epilepsy.

SLP Therapy
SLP Areas to be Evaluated:

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- Receptive language: Ability to understand spoken language
- Expressive language: Ability to use language to communicate (speaking, writing)
- Vocabulary and grammar
- Speech production: Articulation, Quality, Clarity, Fluency, and Prosody of speech, Presence of apraxia of speech or dysarthria
- Pragmatics: Use of language in social contexts, Turn-taking in conversation, Understanding non-verbal cues
- Cognition: Attention, Memory, Problem-solving, Executive functioning

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<tr><td>Evaluation Materials</td><td>

- Standardized tests: Age-appropriate assessments for speech, language, and cognitive skills
- Informal assessments: Conversation samples, play-based activities, observations

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<tr><td>Possible Strategies and/or Approaches</td><td>

- Language
  - Vocabulary development: Activities and strategies to help learn new words and improve word retrieval.
  - Grammar intervention: Exercises to improve sentence structure and grammar usage.
  - Reading and writing intervention: Techniques to address specific reading and writing difficulties.
  - Augmentative and Alternative Communication (AAC): For individuals with severe language limitations, using tools and strategies to support communication (e.g., picture boards, electronic communication devices).
- Speech
  - Articulation therapy: Exercises to improve production of specific sounds.
  - Fluency therapy: Techniques to manage stuttering or disfluencies.
  - Voice therapy: Exercises to improve vocal quality and reduce strain.
  - Apraxia of speech therapy: Techniques to improve planning and sequencing of speech movements.
  - Dysarthria therapy: Exercises to improve muscle coordination and control for speech production.
- Cognition
  - Cognitive rehabilitation: Techniques to improve attention, memory, problem-solving, and executive functioning skills.
- Pragmatics
  - Social communication training: Activities to teach social interaction skills and appropriate

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	language use in different settings. ○ Social skills groups: Opportunities to practice communication skills with peers in a safe environment.
Additional Considerations	● SLP evaluation and therapy will be tailored to the individual's specific needs and age group (pediatrics, adults, geriatrics). ● Collaboration with the child's doctor or the adult's neurologist is important to ensure a comprehensive treatment plan. ● Family education and support are crucial for ongoing communication development at home.

THE HEALTHCARE TEAM FOR SEIZURE DISORDERS

Epileptologists	● Doctors trained in neurology (disorders of the brain) and have additional training in diagnosing and treating people with epilepsy
EEG technologist	● Performs electroencephalogram (EEG) tests and assists patients and doctors
Neurosurgeons	● Surgeons specializing in treating brain and spinal cord disorders
Neuroradiologists	● Doctors trained in radiology, specializing in creating and interpreting pictures of the brain and spinal cord
Neuropsychologist	● Specializes in the relationship between the central nervous system (the brain or spinal cord) and mental functions
Nurses	● Assists in all aspects of patient care, and includes nurse-clinicians and nurse practitioners

Pharmacists	● Fills prescriptions and provides expert information about medications
Social workers	● Plays a varied role, such as educating patients and families, provides community support and resources, helps in crisis situations and more
Doctor	● Evaluates a person's medical history and current symptoms, creates, and manages treatment plans, and more
Psychiatrists and Psychologists	● Helps manage mental and emotional health
Occupational Therapist	● Empowers individuals to maximize their independence throughout activities of daily living
Physical Therapist	● Helps limit the movements within a seizure
Speech-Language Pathologist	● Assesses their speech and language abilities, identifies areas of difficulty, and diagnoses related disorders. They develop personalized treatment plans to improve communication skills and manage speech and language challenges

MEDICAL PRECAUTIONS FOR SEIZURE DISORDERS

Obtain Information	● Before beginning therapy sessions, gather detailed information about the client's seizure history, including the type of seizures they experience, triggers, frequency, and any warning signs or auras they may have.

Maintain a Safe Environment	● Create a safe therapy environment by removing potential hazards, such as sharp objects or obstacles, and ensuring that the space is well-lit and ventilated.
Develop a Safety Plan	● Collaborate with the client and their caregivers to develop a safety plan specific to their needs. This plan should include steps to take in the event of a seizure during a therapy session, such as moving furniture out of the way, ensuring a clear path to prevent injury, and providing appropriate support.
Identify Triggers	● Be aware of potential seizure triggers and take steps to minimize or avoid them during therapy sessions. ● Common triggers may include stress, fatigue, flashing lights, or specific activities.
Educate Staff and Caregivers	● Provide education and training to staff members and caregivers involved in the client's care on how to respond to seizures effectively (i.e., teaching seizure first aid).
Document Seizure Activity	● Keep detailed records of any seizure activity observed during therapy sessions, including the duration, type, and any associated symptoms. This information can help inform treatment planning and coordination with other healthcare providers.
Be Prepared to Respond	● Familiarize oneself with the client's individualized seizure action plan and be prepared to respond quickly and calmly if a seizure occurs during a therapy session. Stay with the client, protect them from injury, and provide reassurance and support until the seizure subsides.
Communication	● Maintain open communication with the client, their caregivers, and other members of the healthcare team regarding any changes in seizure activity or concerns related to safety during therapy sessions.

Preventive Measures	
Before Therapy Sessions	● Client Assessment ○ Conduct a thorough assessment of the client's seizure history, type of seizures they experience, triggers, frequency, and any warning signs. ● Safety Plan Development ○ Collaborate with the client and caregivers to develop a personalized safety plan that outlines steps to take in the event of a seizure during therapy sessions. ● Environment Preparation ○ Create a safe therapy environment by removing potential hazards and ensuring that the space is well-lit and ventilated. ● Identify Triggers ○ Be aware of potential seizure triggers and take steps to minimize or avoid them during therapy sessions. ● Communication ○ Establish open communication with the client and their caregivers regarding any concerns, changes in seizure activity, or specific precautions that need to be taken during therapy sessions.
During Therapy Sessions	● Supervision ○ Maintain constant supervision of the client during therapy sessions, especially if they are at higher risk of experiencing seizures. ● Positioning ○ Ensure that the client is positioned safely and comfortably during therapy sessions, with easy access to exits and clear pathways in case of a seizure. ● Seizure Recognition ○ Be vigilant of seizure signs and symptoms so that you can respond promptly if a seizure occurs. ● Reassurance ○ Provide reassurance and support to the client throughout the therapy session, and remain calm if a seizure occurs. ● Documentation ○ Keep detailed records of any seizure activity observed during therapy sessions, including the duration, type, and any associated symptoms. Include the client's response

	and any interventions provided.
After Therapy Session	● Debriefing ○ Following a therapy session where a seizure occurred, debrief with the client and their caregivers to discuss what happened and any necessary follow-up actions. ● Follow-Up ○ Follow up with the client and their caregivers as needed to address any concerns or adjustments to the therapy plan based on seizure activity.

SUPPORT SYSTEMS FOR PEOPLE WITH DENTAL CONDITIONS AND DENTAL HYGIENE

Existing Support Systems	● Philippine League Against Epilepsy (PLAE) ● Epilepsy Foundation Philippines ● International Bureau for Epilepsy (IBE) ● Epilepsy Foundation (USA)
Organizations	
Epilepsy Foundation	The Epilepsy Foundation is dedicated to leading the fight against epilepsy and its challenges. Their mission is to accelerate therapies to stop seizures, find cures, and ultimately save lives. They provide support, resources, and advocacy for individuals living with epilepsy, as well as their families and caregivers. The Epilepsy Foundation offers a wide range of services, including educational programs, support groups, seizure recognition and first aid training, advocacy for public policies supporting epilepsy awareness and research, and funding research initiatives aimed at finding better treatments and ultimately a cure for epilepsy.

Philippine League Against Epilepsy (PLAE)	PLAE is a non-profit organization composed of health and health-related professionals in the Philippines. They are committed to improving the quality of life for individuals with epilepsy through various initiatives, including education, research, prevention, advocacy, and the delivery of optimal healthcare. PLAE serves as the Philippine chapter of the International League Against Epilepsy (ILAE), collaborating with global efforts to address epilepsy. PLAE's objectives focus on disseminating knowledge about epilepsy among medical professionals, promoting training, research, and prevention efforts, and improving healthcare and the overall quality of life for individuals with epilepsy in the Philippines. PLAE's affiliation with the International League Against Epilepsy (ILAE) allows for collaboration with global efforts to address epilepsy and ensures access to international resources and expertise. The "Epilepsy: Out of the Shadows" campaign in the Philippines aims to combat misinformation, reduce stigma, and raise awareness about epilepsy as a neurological condition. By addressing discrimination and stigma, the campaign seeks to improve the lives of individuals affected by epilepsy and promote greater understanding and acceptance within society.

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