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An English Course in Language and Speech Therapy and Audiology III

PREPARED BY

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CAPPADOCIA UNIVERSITY PRESS

AN ENGLISH COURSE IN LANGUAGE AND SPEECH THERAPY AND AUDIOLOGY III

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CAPPADOCIA UNIVERSITY
2026

Cappadocia University Press: 141
ISBN: 978-625-5463-10-4
DOI: 10.35250/kun/9786255463104
URL: https://hdl.handle.net/20.500.12695/4333

© October 2026

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Certificate Number: 43348

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Page Layout and Cover Design: Onur Eren
Visual Design: Büşra Başak Altun
Proofreading: Muratcan Bul
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This book was supported by Research Fund of the Cappadocia University. Project Number: KÜN.2024.BAGP.042

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Gültekin, A., Serçe, E., Köksal, K. (Prepared by). (2026). *An English Course in Language and Speech Therapy and Audiology III*. Nevşehir: Cappadocia University Press.
124 p.
ISBN: 978-625-5463-10-4
DOI: 10.35250/kun/9786255463104
URL: https://hdl.handle.net/20.500.12695/4333
Keywords: Language and Speech Therapy, Audiology, Acoustic, Voice Therapy, Sound

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TARGET VOCABULARY

acquired, anterior, commissure, breathing, congenital, endotracheal tube, genetic abnormality, idiopathic, impairment, laryngeal web, prenatal, react, surgical procedure, vocal fold surgery



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Congenital Laryngeal Webs

Laryngeal webs are **bridges** of tissue that connect the left and right vocal folds, most commonly at the anterior **commissure**. **Multiple** causes of laryngeal webs have been **described**, including congenital and acquired (e.g., due to **irritation** from an endotracheal tube or vocal fold surgery) etiologies. Congenital webs are present at birth and are thought to result from **incomplete** prenatal vocal fold development. Congenital webs can result from idiopathic (unknown) causes or due to genetic abnormalities that interfere with normal development. The effect of a laryngeal web on voice production depends on the extent of the web. Small webs connecting the left and right vocal folds at the anterior commissure only ("microwebs") may have minimal if any noticeable effects on voice or breathing.

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A. Answer the following questions.

1. What are laryngeal webs, and where are they most commonly found?
2. List the different causes of laryngeal webs mentioned in the passage.
3. Explain the term "microwebs" as used in the passage.

However, larger webs that extend into the mid-membranous region of the vocal folds can interfere with breathing and voice production. Treatment for laryngeal webs depends on the degree of impairment of breathing or voice. Surgical **procedures** are an option for **dissecting** the web to release the left and right vocal folds. Once the web has been resected, surgeons typically place some material on the free edges of the vocal folds to **prevent** the web from reforming. The proximity of the vocal folds to each other anteriorly and their complete **adduction** during phonation and nonspeech vocalizations places the tissue at risk for **reformation** of the web.

ADAPTED FROM BERNARD BRANNON RYAN C.C., ANATOMY AND PHYSIOLOGY OF SPEECH AND HEARING, NEW YORK, THIEME PUBLISHERS, 2018, P. 302

B. Answer the following questions.

1. What factors determine the treatment for laryngeal webs?
2. Why is material placed on the vocal folds after the resection of a laryngeal web?

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Context Exercises

A. Read the passages again. Mark the sentences True (T) or False (F). Correct the false sentences.

1. ( ) Laryngeal webs only occur as a result of genetic abnormalities.
2. ( ) Congenital laryngeal webs are present at birth.
3. ( ) Microwebs usually have significant effects on both voice and breathing.
4. ( ) Larger laryngeal webs that extend into the mid-membranous region can interfere with breathing and voice production.
5. ( ) Surgical procedures for laryngeal webs involve placing material on the vocal folds to prevent reformation.
6. ( ) Laryngeal webs are most commonly found in the posterior region of the vocal folds.
7. ( ) Acquired laryngeal webs can result from irritation due to an endotracheal tube.
8. ( ) Once resected, there is no risk of laryngeal webs reforming.

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B. Ask questions for the given answers.

1. Question: _____?
Answer: A laryngeal web is a bridge of tissue that connects the left and right vocal folds.

2. Question: _____?
Answer: Laryngeal webs are most commonly found at the anterior commissure.

3. Question: _____?
Answer: Congenital laryngeal webs result from incomplete prenatal vocal fold development.

4. Question: _____?
Answer: Microwebs are small laryngeal webs that may have minimal effects on voice or breathing.

5. Question: _____?
Answer: Acquired laryngeal webs can develop due to irritation from an endotracheal tube or vocal fold surgery.

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Vocabulary Study

A. Find the words that are bold in the passage which mean the following.

1. Something that provides a connection between two things: _____
2. Many, or involving many things, people, events, etc.: _____
3. A painful sore feeling on a part of your body: _____
4. To cut up the body of a dead animal or person in order to study: _____
5. Not completely finished: _____
6. To say what something or someone is like by giving details about them: _____
7. To stop something from happening or stop someone from doing something: _____
8. The act of making an improvement, especially by changing a person's behavior or the structure of something: _____
9. The movement of a part of the body towards the middle of the body or towards another body part: _____
10. A medical treatment or operation: _____
11. A surface where two parts meet, for example the lips: _____

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B. Match the words with their synonyms.

1. Prevent	a) combine, associate, attach
2. Extend	b) obtain, achieve, get
3. Acquire	c) unfinished, deficient, inadequate
4. Incomplete	d) impact, influence, impression
5. Interfere	e) avoid, forbid, block
6. Connect	f) broaden, enlarge, widen
7. Effect	g) intervene, meddle, intrude

C. Complete the sentences with the words in the activity B.

1. Larger webs can _____ into the middle of the vocal folds and cause problems.
2. Larger webs can _____ with both breathing and speaking.
3. Surgeons place material on the vocal folds to _____ the web from coming back.
4. Congenital laryngeal webs are caused by _____ development before birth.
5. The _____ of a laryngeal web on voice depends on its size.
6. Laryngeal webs _____ the left and right vocal folds.
7. Some people can _____ laryngeal webs after surgery or other medical procedures.

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D. Fill in the table below.

Noun	Verb	Adjective	Adverb
	describe		
		noticeable	
acquisition			X
	X		proximately
impairment			X

E. Fill in the blanks with the words from the table.

1. The surgeon was concerned about the _____ of the patient's breathing due to the web.
2. The _____ of the patient's symptoms was crucial for accurate diagnosis.
3. The patient _____ a new skill after several sessions of therapy.
4. The _____ of the two structures made surgery challenging.
5. The change in the patient's voice was very _____ after surgery.
6. The doctor explained the procedure _____ so the patient could understand it better.
7. The tissue was _____ after years of strain and required medical intervention.

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8. The surgeon carefully examined the area _____ before proceeding with the surgery.
9. After practicing, the child showed a strong _____ of language skills.
10. The patient didn't _____ any changes in their voice after the treatment.

Language Study: Once

Once is used as a subordinating conjunction to indicate that something happens after another event or action. It often implies that the second action happens immediately after the first.

- Once the initial assessment is completed, the speech therapist will develop a personalized treatment plan for the client.
- Once the hearing test is administered, the audiologist will review the results to determine the best course of action for hearing aids.

Here are some examples from the passage:

- "Once the web has been resected, surgeons typically place some material on the free edges of the vocal folds to prevent the web from reforming."

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A. Rewrite the sentences with "once".

1. After the audiologist completes the hearing test, she will discuss the results with the patient.
Answer: _____

2. The patient will notice a significant improvement in hearing after the hearing aids are properly fitted.
Answer: _____

3. After the therapy session ends, the speech therapist will provide homework exercises.
Answer: _____

4. The speech-language therapist will schedule follow-up appointments after she assess the patient's progress.
Answer: _____

5. After she reviews them thoroughly, the audiologist will explain the test results.
Answer: _____

6. The therapy sessions will be adjusted after the initial goals are met.
Answer: _____

7. After they changed their therapists, they understood what their problem was.
Answer: _____

8. Audiologists should start treating the patients after they are diagnosed.
Answer: _____

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IMAGE MADE WITH GOOGLE AI

Spasmodic Dysphonia

Spasmodic dysphonia (SD) is a neurological voice disorder thought to be caused by dysfunction in the subcortical regions of the brain. SD is classified as a focal dystonia, one of a clinical manifestation is characterized by **intermittent** hyperadduction ("adductor SD") or hyperabduction ("abductor SD") of the vocal folds. It is a task-specific disorder that involves muscles used for speech production in voice areas and is typically accompanied by hyperfunctional muscular effort. In abductor SD, the voice sounds intermittently breathy with voice breaks and accompanying vocal hyperfunction.

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A. Answer the following questions.

1. What are the symptoms of adductor SD and abductor SD?
2. What is the difference between adductor and abductor SD.

Primary treatment for SD involves injections of botulinum toxin (BT) into the laryngeal muscles. Typically, an otolaryngologist uses electromyography and/or endoscopy to ensure **accurate placement** of BT. In the first week after BT injections, the voice may become breathy. This breathiness improves and the **severity** of the laryngeal dystonia is reduced. **enabling** less effortful voice production with fewer voice breaks. Unfortunately, BT injections do not cure SD. The effects **are temporary**, and patients **return** for repeat injections every 3 to 6 months.

B. Answer the following questions.

1. What is the primary treatment for Spasmodic Dysphonia?
2. How long do the effects of the treatment typically last?

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Context Exercises

A. Read the passages again. Mark the sentences True (T) or False (F). Correct the false sentences.

1. ( ) Spasmodic dysphonia (SD) is caused by dysfunction in the cortical regions of the brain.
2. ( ) Adductor spasmodic dysphonia is characterized by intermittent hyperabduction of the vocal folds.
3. ( ) The voice in adductor spasmodic dysphonia sounds strained and strangled and is typically accompanied by hyper-functional muscular effort.
4. ( ) Abductor spasmodic dysphonia involves consistent clear voice without any voice breaks.
5. ( ) In abductor spasmodic dysphonia, the voice sounds intermittently breathy and is accompanied by vocal hyperfunction.
6. ( ) Spasmodic dysphonia (SD) is a type of voice disorder that is always present and does not vary over time.

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B. After reading the passages thoroughly, answer the given questions.

1. What is spasmodic dysphonia (SD) thought to be caused by?
   a. Dysfunction in the subcortical regions of the brain
   b. Vocal fold overuse
   c. Laryngeal trauma
   d. Allergic reactions
2. How is spasmodic dysphonia classified?
   a. As a general dystonia
   b. As a focal dystonia
   c. As a systemic disorder
   d. As a chronic vocal condition
3. What are the clinical manifestations of adductor spasmodic dysphonia (SD)?
   a. Breathiness with voice breaks
   b. Strained and strangled voice with intermittent voice breaks
   c. Hyper functional muscular effort without voice breaks
   d. Consistent hoarseness
4. How does the voice sound in abductor spasmodic dysphonia (SD)?
   a. Strained and strangled with intermittent breaks
   b. Intermittently breathy with voice breaks
   c. Consistently clear with no breaks
   d. Hoarse and sheady

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5. What type of vocal fold movement characterizes adductor spasmodic dysphonia (SD)?
   a. Hyperabduction
   b. Hyperadduction
   c. Normal adduction
   d. Normal abduction
6. What is a common feature of both types of spasmodic dysphonia (SD)?
   a. Intermittent voice breaks
   b. Consistent hoarseness
   c. Vocal fatigue
   d. Persistent whispering

C. Ask questions for the given answers.

1. Question: _____?

Answer: SD is a neurological voice disorder that affect the voice muscles, causing involuntary spasms and interruptions in speech.

2. Question: _____?

Answer: SD is classified as a focal dystonia.

3. Question: _____?

Answer: Adductor SD and Abductor SD are the two main types of SD.

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4. Question: _____?

Answer: A strained, strangled voice with intermittent voice breaks and hyper functional muscular effort are the symptoms of Adductor SD.

5. Question: _____?

Answer: An intermittently breathy voice with voice breaks and vocal hyper function are the symptoms of Abductor SD.

Vocabulary Study

A. Find the words that are bold in the passage which mean the following.

1. The quality of being extremely painful, difficult, etc: _____
2. Continuing for only a limited period of time: _____
3. To injure a muscle or part of your body by using it too much or making it work too hard: _____
4. Stopping and starting often and for short periods: _____
5. Most important: _____
6. Correct and true in every detail: _____
7. To go or come back to a place where you were before: _____
8. To make it possible for someone to do something, or for something to happen: _____
9. The act of finding a place for someone to live or work: _____

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B. Match the words with their synonyms.

1. Primary	a) advance, boost, enhance
2. Ensure	b) cue, analysis, medication
3. Accurate	c) guarantee, make secure, assure
4. Improve	d) basic, dominant, essential
5. Reduce	e) precise, authentic, correct
6. Treatment	f) decrease, cut down, diminish

C. Complete the sentences with the words in the activity B.

1. The _____ goal of speech therapy is to help individuals communicate effectively and confidently.
2. Continuous professional development can help therapists _____ their skills and stay updated with the latest treatment techniques.
3. Successful _____ depends on a comprehensive understanding of the patient's communication challenges.
4. Implementing regular exercises can help _____ the severity of speech disorders over time.
5. Accurate diagnosis is crucial to determine the most effective _____ plan for each patient.
6. It is important to _____ that all hearing assessments are conducted in a quiet environment to obtain reliable results.

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D. Fill in the table below.

Noun	Verb	Adjective	Adverb
	classify		X
		characteristic	
	typify		
		breathy/breathiness	
injection		X	X
		improved	X

E. Fill in the blanks with the words from the table.

1. Patients with similar symptoms often share _____ speech patterns that can guide diagnosis and treatment.
2. The therapist decided to _____ the speech disorder based on the patient's symptoms and communication abilities.
3. After the therapy sessions, there was a noticeable _____ in the patient's articulation and fluency.
4. _____ patients with this condition exhibit difficulties in both speech and swallowing.
5. The doctor will _____ a small amount of the treatment solution directly into the affected area to reduce symptoms.

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6. It is essential to _____ the accuracy of diagnostic tools to better detect early signs of auditory processing disorders.
7. The patient spoke _____ after completing a long sentence, which indicated possible respiratory issues during speech.
8. The doctor used a specific _____ technique to administer the medication directly into the laryngeal muscles.

Language Study: Less and Fewer

"**Less**" and "**fewer**" are both used to indicate a smaller quantity, but they are used in different contexts depending on whether the noun they are describing is countable or uncountable.

"**Less**" is used with uncountable nouns, which refer to things that cannot be counted individually. These are often abstract concepts, substances, or collective nouns.

- The patient showed **less** difficulty with articulation after several therapy sessions.
- Patients with stuttering may feel **less** anxiety when they use fluency-shaping techniques.

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"**Fewer**" is used with countable nouns, which refer to things that can be counted individually.

- The patient made **fewer** errors during the speech repetition task after therapy.
- The new hearing aids resulted in **fewer** complaints about background noise from participants.

Some examples from the passages:

- This breathiness improves and the severity of the laryngeal dystonia is reduced, enabling **less** effortful voice production with **fewer** voice breaks.

A. Complete the sentences with "fewer" or "less".

1. The child needed _____ speech therapy sessions after showing rapid improvement.
2. After using the new hearing aids, there was _____ background noise reported in the classroom.
3. The clinician noted _____ articulation errors during the final assessment.
4. The patient felt _____ vocal strain after implementing proper breath support techniques.
5. _____ clients complained about the difficulty of the auditory processing tasks after adjustments were made.
6. With the new treatment approach, the child experienced _____ frustration during communication.

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7. The speech-language pathologist observed _____ instances of disfluency after the fluency-shaping exercises.
8. _____ distractions in the therapy room led to improved focus during the session.
9. The patient exhibited _____ avoidance behaviors in social situations after completing therapy.
10. The team observed _____ cases of miscommunication during group therapy sessions.

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SMART VOCABULARY

airflow, body type, closure phase, closing phase, cycle, displacement, elasticity, glottis, opening phase, oscillation phonation, subglottic pressure, vibration

IMAGE MADE WITH GOOGLE AI

Vibratory Cycle

Vocal fold **vibration** can be thought of as a self-oscillating system, where the power source (e.g., airflow from the lungs) is **steady**, but the **dynamic** motion of the vocal folds is **sufficient** to **maintain** cyclic back-and-forth movement as long as the power source is available. You will recall that the vocal folds consist of functional layers that include the cover, the vocal ligament, and the muscle body, and that each layer, including its pliability, elasticity, and geometry, allow **variable** aerodynamic **pressures**, which, along with influences from the supraglottic and subglottic spaces, create the dynamic forces that drive oscillation during voice production.

A. Answer the following questions.

1. What are the key components of a self-oscillating system in vocal fold vibration?
2. How do supraglottic and subglottic spaces influence vocal fold vibration?
3. Can you describe the relationship between vocal fold geometry and oscillation?

At the onset of phonation, the vocal folds are adducted at midline. In this **posture**, the vocal folds are considered in a position of minimum displacement. A cycle of vocal fold vibration, or one vibratory cycle, begins when subglottic air pressure builds up below the closed vocal folds. The vocal folds are blown apart by this air pressure and **reach** a point of maximum lateral displacement and return to the midline position. Thus, the cycle of vocal fold vibration begins with a closed phase, where the vocal folds are at a point of minimum displacement, followed by an opening phase, where the vocal folds move laterally to change the airflow and terminate with the vocal folds at a point of maximum displacement from midline, followed by a closing phase, where they return to midline.

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B. Answer the following questions.

1. What is the initial position of the vocal folds at the onset of phonation?
2. What is the relationship between the closed phase and the minimum displacement of the vocal folds?
3. Can you describe the sequence of events in a single vibratory cycle?

Context Exercises

A. Read the passages again. Mark the sentences True (T) or False (F). Correct the false sentences.

1. ( ) Vocal fold vibration is maintained by a steady power source and dynamic motion of the vocal folds.
2. ( ) The vocal folds consist of a single functional layer that drives oscillation during voice production.
3. ( ) In the vibratory cycle, the vocal folds begin at a position of maximum displacement.
4. ( ) Subglottic air pressure opens the adducted vocal folds at the onset of phonation.
5. ( ) The cycle of vocal fold vibration begins with the vocal folds in a closed phase, at a point of minimum displacement.
6. ( ) During the opening phase of the vibratory cycle, the vocal folds move laterally to reach a point of maximum displacement.
7. ( ) In the vibratory cycle, the vocal folds remain in a state of maximum displacement for an extended period before returning to midline.
8. ( ) The physiological properties of the vocal fold cover, such as pliability and elasticity, contribute to the dynamic forces that drive vocal fold oscillation.

B. Ask questions for the given answers.

1. Question: _____?
Answer: A steady power source and dynamic motion of the vocal folds maintain vocal fold vibration.
2. Question: _____?
Answer: Multiple functional layers which include a cover, and a body are the functional layers that the vocal folds consist of.
3. Question: _____?
Answer: Subglottic air pressure opens the adducted vocal folds at the onset of phonation.
4. Question: _____?
Answer: Vocal folds return to the midline position.
5. Question: _____?
Answer: Pliability, elasticity, and geometry contribute to vocal fold vibration.
6. Question: _____?
Answer: The vocal folds move laterally to reach a point of maximum displacement.

C. Answer the questions according to the passages.

1. What is the power source for vocal fold vibration?
   a. Vocal fold elasticity
   b. Airflow from the lungs
   c. Supraglottic space
   d. Intraglottal pressure
2. How is vocal fold vibration maintained?
   a. By static vocal fold movement
   b. By cyclic back-and-forth movement
   c. By constant subglottic pressure
   d. By airflow without movement
3. What functional layers do the vocal folds consist of?
   a. Pliability and elasticity
   b. Subglottic and supraglottic spaces
   c. A cover and a body
   d. Intraglottal and supraglottic spaces
4. What are the key physiological properties of the vocal fold cover mentioned in the passage?
   a. Airflow and subglottic pressure
   b. Pliability, elasticity, and geometry
   c. Cyclic motion and steady power source
   d. Intraglottal and supraglottic influences

5. Which spaces influence the dynamic forces that drive oscillation during voice production?
   a. Intraglottal and airflow spaces
   b. Supraglottic and subglottic spaces
   c. Elasticity and pliability spaces
   d. None of the above
6. What role do intraglottal pressures play in vocal fold vibration?
   a. They create static forces.
   b. They contribute to dynamic forces.
   c. They stop oscillation.
   d. They reduce vocal fold elasticity.
7. How do the physiological properties of the vocal fold cover affect voice production?
   a. They reduce airflow from the lungs.
   b. They enable dynamic forces that drive oscillation.
   c. They prevent vocal fold vibration.
   d. They create subglottic pressure.

Vocabulary Study

A. Find the words that are bold in the passage which mean the following.

1. The thing or things that someone owns: _____
2. To get to a particular level, especially a high one: _____
3. A number, amount, or situation that can change and affect something in different ways: _____
4. The way you position your body when sitting or standing: _____
5. Continuing or developing gradually or without stopping, and not likely to change: _____
6. The force or weight that is being put on to something: _____
7. A continuous slight shaking movement: _____
8. Enough for a particular purpose: _____
9. Continuously changing or developing: _____
10. To make something continue in the same way or at the same standard as before: _____

B. Match the words with their synonyms.

1. Maintain	a) remember, call up, remind
2. Recall	b) analyze, think, regard
3. Variable	c) keep up, continue, preserve
4. Consider	d) start, initiate, lead
5. Brief	e) changing, changeable, fluctuating
6. Begin	f) short, abrupt

C. Complete the sentences with the words in the activity B.

1. To ensure effective progress in therapy, it is crucial for speech-language pathologists to _____ a structured and consistent approach.
2. To effectively address a client's speech sound disorder, therapy should _____ with a thorough evaluation of their current speech abilities.
3. When creating an individualized treatment plan, clinicians must _____ the client's specific needs, strengths, and goals.
4. In cognitive-communication therapy, clients may be asked to _____ specific details from a story to assess their memory and comprehension skills.
5. A _____ assessment at the beginning of each session helps to monitor progress and adjust therapy strategies as needed.
6. The effectiveness of speech therapy can be influenced by _____ factors such as the client's age, severity of the disorder, and frequency of therapy sessions.

D. Fill in the table below.

Noun	Verb	Adjective	Adverb
	X	cyclic/cyclical	
			functionally
	move		
sufficiency			
		considerable/considerate	
	displace		X

E. Fill in the blanks with the words from the table above.

1. The _____ of a hearing aid is to help people hear better and _____ more effectively.
2. Therapy goals should be _____ to meet the client's needs and help them improve.
3. A displaced vocal cord can affect speech and may require _____ treatment.
4. Some speech issues can improve and worsen _____ so treatment needs to be adjusted accordingly.
5. If a client's speech organs are not _____, it can be hard to produce certain sounds clearly.

6. With consistent effort, the improvements in speech therapy can be _____.
7. To ensure accurate results, the testing conditions should be _____ controlled to avoid interference.

Language Study: As long as

"As long as" is used to indicate a condition that must be met for something to happen. It sets a requirement or condition for the main action or outcome.

- "As long as the client follows the therapy plan consistently, they will likely make progress."

Here is a sentence from the passage:

- "Vocal fold vibration can be thought of as a self-oscillating system, where the power source (e.g., airflow from the lungs) is steady, but the dynamic motion of the vocal folds is sufficient to maintain cyclic back-and-forth movement **as long as** the power source is available."

A. Rewrite each sentence with "as long as".

1. The therapy session will continue if the client remains engaged.
Answer: _____
2. You can see progress in speech clarity provided that you do the exercises regularly.
Answer: _____
3. The hearing aids will work effectively if they are properly maintained.
Answer: _____
4. The client will participate in the group activities, provided they feel comfortable.
Answer: _____
5. The treatment plan will be successful if all recommended strategies are implemented.
Answer: _____

5

TARGET VOCABULARY

acid reflux, asthma, breaths, breath control, diagnosis, episode, glottis, inhalation, involuntary, narcos, respiratory retraining, trigger, voluntary

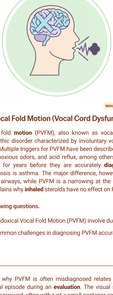


IMAGE MADE WITH GOOGLE AI

Paradoxical Vocal Fold Motion (Vocal Cord Dysfunction)

Paradoxical vocal fold **motion** (PVFM), also known as vocal cord dysfunction (VCD), is an idiopathic disorder characterized by involuntary vocal fold adduction during inspiration. Multiple triggers for PVFM have been described and may include physical exertion, noxious odors, and acid reflux, among others. Many individuals with PVFM **suffer** for years before they are accurately **diagnosed**. The most common misdiagnosis is asthma. The major difference, however, is that asthma narrows the lower airways, while PVFM is a narrowing at the level of the glottis. This difference explains why **inhaled** steroids have no effect on PVFM.

A. Answer the following questions.

1. What does Paradoxical Vocal Fold Motion (PVFM) involve during inspiration?
2. What are the common challenges in diagnosing PVFM accurately?

One major reason why PVFM is often misdiagnosed relates to the difficulty in observing an actual episode during an **evaluation**. The visual signs of PVFM are clear; the glottis is narrowed, often with just a small posterior gap during inhalation, but many patients are unable to **elicit** an episode of PVFM voluntarily. Once a diagnosis is made, however, respiratory retraining therapy is quite effective. Individuals are instructed to identify **relevant** triggers, identify their physical reactions to these triggers, and learn breath control strategies to prevent and/ or reduce the severity of PVFM episodes.

SUSSMAN BERNARD. BRANNAN RYAN C., ANATOMY AND PHYSIOLOGY OF SPEECH AND HEARING, NEW YORK, THEME PUBLISHERS, 2006, P. 370.

B. Answer the following questions.

1. Why is PVFM often misdiagnosed?
2. Why might patients have difficulty demonstrating an episode of PVFM during an evaluation?

Context Exercises

A. Read the passages again. Mark the sentences True (T) or False (F). Correct the false sentences.

1. ( ) Paradoxical Vocal Fold Motion (PVFM) is also known as vocal cord dysfunction (VCD).
2. ( ) PVFM is characterized by involuntary vocal fold abduction during expiration.

3. ( ) Triggers for PVFM may include physical exertion, noxious odors, and acid reflux.
4. ( ) Asthma and PVFM are similar because both involve narrowing of the lower airways.
5. ( ) Inhaled steroids are effective in treating PVFM because they reduce inflammation in the glottis.
6. ( ) It is often difficult to observe an episode of PVFM during an evaluation, leading to potential misdiagnosis.
7. ( ) The visual signs of PVFM during an episode include a widely open glottis with no gaps.
8. ( ) Once diagnosed, respiratory retraining therapy is ineffective in managing PVFM episodes.
9. ( ) Respiratory retraining therapy includes identifying triggers and learning breath control strategies.
10. ( ) Many patients with PVFM are accurately diagnosed immediately due to clear and distinct symptoms.

B. Ask questions for the given answers.

1. Question: _____?
Answer: PVFM is also known as Vocal Cord Dysfunction (VCD).

2. Question: _____?
Answer: Involuntary vocal fold adduction during inspiration characterizes PVFM.

3. Question: _____?
Answer: Physical exertion, noxious odours, and acid reflux are some common triggers for PVFM.

4. Question: _____?
Answer: Because both conditions involve breathing difficulties.

5. Question: _____?
Answer: The main difference between asthma and PVFM is that the former narrows the lower airways while the latter causes narrowing at the level of the glottis.

6. Question: _____?
Answer: A narrowed glottis is a characteristic of PVFM during inhalation.

Vocabulary Study

A. Find the words in the passage which means the following.

1. To breathe in air, smoke, or gas: _____
2. The process of moving or the way that someone or something moves: _____
3. A judgment about how good, useful, or successful something is: _____
4. To succeed in getting information or reaction from someone or something: _____
5. Directly relating to the subject or problem being discussed or considered: _____
6. To experience physical or mental pain: _____
7. To find out what illness someone has, or what the cause of a fault is, after doing test, examinations, etc.: _____

B. Fill in the table.

Noun	Verb	Adjective	Adverb
			voluntarily
evaluation		X	X
	X		relevantly
sufferance			
		inspirational	

B. Fill in the blanks with the words from the table above.

1. The speech therapist's work was _____, reflecting her dedication to helping children with communication disorders.
2. The new research findings _____ the audiologist to develop more effective hearing aid devices.
3. The assessment tools used in speech therapy need to be _____ to the specific needs of each patient.
4. To ensure _____ diagnosis and treatment, clinicians must use the latest testing methods and technology.
5. Therapy techniques aim to _____ the impact of speech disorders on a person's daily life.

6. Many professionals _____ offer their time to provide pro bono services for underserved communities.
7. Children with speech delays may _____ from social challenges due to difficulties in communication.
8. The speech pathologist's success stories are often _____ for those entering the field.

Language Study: Many / Much

"Much" is used with uncountable nouns.

- There is not much research available on the long-term effects of new speech therapy techniques.
- We need much more practice to improve our pronunciation and fluency.
- How much progress has been made in developing new audiological assessments?

"Many" is used with countable nouns.

- How many children have benefited from early speech intervention programs this year?
- There are many different types of hearing aids available for patients with hearing loss.
- The speech-language pathologist reviewed many case studies to prepare for the workshop.

Tips:

- If you can count the items individually (like "books," "patients," "errors"), use "many."
- If you cannot count the items individually (like "information," "time," "water"), use "much."

Here are some examples from the passages:

- "Many individuals with PVFM suffer for years.."
- "Many patients are unable to elicit an episode.."

A. Complete the sentences with "much or many."

1. There are _____ new techniques being developed for treating stuttering.
2. _____ research has been conducted on the effectiveness of teletherapy for speech disorders.
3. How _____ clients have benefited from the new language development program?
4. The audiologist needs _____ information about the patient's hearing history before recommending a hearing aid.
5. _____ time is needed to evaluate the progress of speech therapy for each patient.
6. We have _____ different therapy methods to choose from when working with children with speech delays.

TARGET VOCABULARY

bilateral, oral, lesion, rhesus, phonation, phonotrauma, polyp, professional voice user, respiratory system, singer, swelling, vocal hygiene, voice therapy



IMAGE MADE WITH GOOGLE AI

Vocal Fold Nodules

Vocal nodules are bilateral masses that occur in the middle of the membranous portion of the vocal folds. True vocal fold nodules are bilateral and typically quasi-symmetrical, which distinguish them from other mid-membranous lesions, such as polyps and cysts. Because they tend to occur in the same region, which happens to be the region of greatest impact stress during phonation, they are generally considered to be caused by phonotrauma, or excessive trauma to the vocal folds due to repeated and prolonged voice use. Vocal nodules start out as small swellings in the vocal fold cover, but over time they can become larger and stiffer in response to voice therapy. Nodules are most often found in individuals with profound vocal demands. These include speakers who use their voices as part of their job, including teachers, clergy, cheerleaders, singers, and other speakers (referred to as "professional voice users"). Vocal nodules usually respond well to voice therapy.

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Voice therapy for vocal nodules typically includes both a focus on vocal hygiene (taking care of the voice through healthy behaviors) and physiologic voice therapy (learning more efft cient ways to produce the impact stress on the vocal folds). Physiologic voice therapy often includes training in the rebalancing of physical eff ort among the respiratory system, larynx, and upper respiratory tract in order to produce a more efficient voice.

ROUSSEAU BERNARD. *MODERN RYAN C. ANATOMY AND PHYSIOLOGY OF SPEECH AND HEARING.* NEW YORK: THEME PUBLISHERS, 2018, P.123.

A. Answer the following questions.

1. What are vocal fold nodules, and where do they typically occur?
2. How do vocal nodules differ from other midmembranous lesions like polyps and cysts?
3. What is believed to be the primary cause of vocal nodules?
4. Which individuals are more prone to developing vocal nodules?
5. What does voice therapy for vocal nodules typically involve?

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Context Exercises

A. Read the passages again. Mark the sentences True (T) or False (F). Correct the false sentences.

1. ( ) Vocal fold nodules are usually unilateral masses that occur on one side of the vocal folds.
2. ( ) Vocal nodules are generally considered to be caused by phonotrauma.
3. ( ) Unlike polyps and cysts, vocal nodules are typically asymmetrical.
4. ( ) Vocal nodules usually start as large, stiff masses in the vocal fold cover.
5. ( ) Vocal nodules primarily affect individuals who do not use their voice professionally.
6. ( ) Voice therapy for vocal nodules often includes a focus on vocal hygiene.
7. ( ) Physiologic voice therapy aims to reduce the impact stress on the vocal fold tissues.
8. ( ) Vocal nodules often occur in the posterior portion of the vocal folds.
9. ( ) Professional voice users, such as teachers and singers, are more likely to develop vocal nodules.
10. ( ) Vocal nodules typically do not respond well to any form of voice therapy.

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B. Ask questions for the given answers.

1. Question: _____?
Answer: Vocal fold nodules are bilateral masses that occur in the middle of the membranous portion of the vocal folds.

2. Question: _____?
Answer: Vocal nodules are typically quasi-symmetrical, which distinguishes them from polyps and cysts.

3. Question: _____?
Answer: Vocal nodules are believed to be caused by phonotrauma, which results from repeated and prolonged voice use.

4. Question: _____?
Answer: Professional voice users, such as teachers, clergy, cheerleaders, and singers, are more prone to developing vocal nodules.

5. Question: _____?
Answer: Voice therapy for vocal nodules typically involves a focus on vocal hygiene and physiologic voice therapy.

6. Question: _____?
Answer: Physiologic voice therapy includes training in the rebalancing of physical effort among the respiratory system, larynx, and upper respiratory tract.

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7. Question: _____?
Answer: Vocal nodules usually start out as small swellings in the vocal fold cover.

8. Question: _____?
Answer: Over time, vocal nodules can become larger and stiffer.

9. Question: _____?
Answer: Vocal nodules that have existed for a long time may be resistant to voice therapy.

10. Question: _____?
Answer: Voice therapy for vocal nodules aims to reduce the impact stress on the vocal fold tissues.

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C. Read the provided sentences from the text and identify what the words in bold refer to.

1. True vocal fold nodules are bilateral and typically quasi-symmetrical, which distinguish **them** from other midmembranous lesions, such as polyps and cysts."
What does "them" refer to? It refers to _____

2. "Because **they** tend to occur in the same region, which happens to be the region of greatest impact stress during phonation, they are generally considered to be caused by phonotrauma."
What does "them" refer to? It refers to _____

3. "Vocal nodules start out as small swellings in the vocal fold cover, but over time **they** can become larger and stiffer."
What does "they" refer to? It refers to _____

4. "Vocal nodules often occur in individuals with profound vocal demands. **These** include speakers who use their voices as part of their job, including teachers, clergy, cheerleaders, singers, and other speakers."
What does "these" refer to? It refers to _____

5. "Physiologic voice therapy often includes training in the rebalancing of physical effort among the respiratory system, larynx, and upper respiratory tract in order to produce a more efficient voice. **This** therapy helps reduce the impact stress on the vocal fold tissues."
What does "this" refer to? It refers to _____

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Vocabulary Study

A. Fill in the blanks with the correct word from the list below.

bilateral	phonotrauma	physiological	quasi-symmetrical	hygiene
impact	vocal folds	resistant	membranous	profound

1. _____ refers to the damage caused by excessive and prolonged voice use.
2. The vocal nodules are _____, meaning they appear on both sides of the vocal folds.
3. Over time, vocal nodules can become stiff and _____ to voice therapy.
4. Individuals with _____ vocal demands, like teachers and singers, are more prone to developing vocal nodules.
5. Voice therapy often includes attention to vocal _____ which means taking care of the voice through healthy behaviors.

B. Match the words on the left with their correct meanings on the right.

1. Phonotrauma — a) Flexible or pliable
2. Bilateral — b) A part that is thin and contains membranes
3. Membranous — c) Occurring on both sides
4. Resistant — d) Injury to the vocal folds from excessive voice use
5. Physiological — e) Related to the functions of living organisms

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Language Study: Relative Clauses

Relative clauses are used to add extra information about a noun without starting a new sentence. They often begin with relative pronouns like who, which, that, whose, where, or when. Relative clauses help make writing more cohesive by connecting ideas more smoothly.

In the text about Vocal Fold Nodules, relative clauses are used to provide additional details about specific terms. Here are some examples:

- "True vocal fold nodules are bilateral and typically quasi-symmetrical, which distinguish them from other midmembranous lesions, such as polyps and cysts."

The relative clause "which distinguish them from other midmembranous lesions" provides more information about how vocal nodules are different from other lesions.

- "Because they tend to occur in the same region, which happens to be the region of greatest impact stress during phonation, they are generally considered to be caused by phonotrauma."

The relative clause "which happens to be the region of greatest impact stress during phonation" gives additional details about the region where vocal nodules occur.

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A. Fill in the blanks with the appropriate relative pronouns: who, which, or where.

1. Vocal nodules _____ are bilateral masses, occur in the middle of the vocal folds.
2. The region _____ they typically form is the area of greatest impact stress during phonation.
3. Phonotrauma, _____ results from excessive voice use, is generally considered the cause of vocal nodules.
4. Professional voice users, _____ often have high vocal demands, are prone to developing nodules.
5. Physiologic voice therapy, _____ is part of the treatment for vocal nodules, helps rebalance physical effort.

B. Combine each pair of sentences into a single sentence using a relative clause. Use who, which, or that as needed.

1. The singer won the award. She practices every day.
Combined Sentence: _____

2. I saw a documentary. It explains the process of vocal therapy.
Combined Sentence: _____

3. The vocal coach lives in New York. He specializes in treating vocal nodules.
Combined Sentence: _____

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4. The technique are effective. They are taught in advanced voice therapy classes.
Combined Sentence: _____

5. The therapist suggested some exercises. The exercises help reduce vocal strain.
Combined Sentence: _____

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TARGET VOCABULARY

ankyloglossia (tongue-tie), articulation, compensate, ebonics, feeding, floor of the mouth, frenectomy, frenulum, movement, palatal, protrusion, progressive, stabilize, tongue tip, tight, tissue



IMAGE MADE WITH GOOGLE AI

Ankyloglossia (Tongue-Tie)

The lingual frenulum is a band of tissue that connects the tongue to the floor of the mouth and assists in stabilizing the tongue. Occasionally, the frenulum may be unusually short, thick, or tight and limit movement of the tongue tip; this condition is referred to as ankyloglossia or tongue-tie. During speech, difficulty elevating the tongue for phonemes that require palatal or alveolar contact may be most apparent. Additionally, the tongue may appear heart-shaped on protrusion.

The treatment is usually the excessive tension at the midline of the tongue by the short frenulum. When newborn feeding problems or childhood articulation difficulties exist, a surgical procedure called a frenectomy (also known as a frenotomy) can be performed if medically necessary. The evidence for improvement in some cases is inconclusive. Speech-language pathologists may also be asked to work with these children before or after surgery.

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A. Answer the following questions.

1. What is the lingual frenulum, and what is its function?
2. What condition is referred to as ankyloglossia or tongue-tie?
3. How does ankyloglossia affect speech?
4. What surgical procedure can be performed to address ankyloglossia, and under what circumstances?
5. What role do speech-language pathologists play in the treatment of ankyloglossia?

Neuromuscular Disease and Tongue Function

Deficits associated with weakened articulatory muscles can have a significant effect on speech intelligibility. In a number of motor neurone diseases, such as amyotrophic lateral sclerosis (also known as Lou Gehrig's disease), muscles of the tongue are affected relatively early. Weakness of the tongue may not be severe enough to produce speech sounds correctly particularly palatal and alveolar consonants and vowels further from the middle of the vowel space. Instead, they will produce speech sounds that are less distinct, because they cannot move their tongue to the appropriate place in the oral cavity. For example, vowels can all sound more like /ʌ/ than the intended target. Individuals often compensate for tongue weakness by moving their jaw more. The genioglossus muscle makes up the bulk of the tongue and is attached to the jaw. Therefore, the jaw can be moved to help place the tongue in the superior-inferior aspect of the oral cavity. These disease processes affect progressive, and therapy typically involves with compensate and their families to develop augmentative and alternative methods of communication.

ROSENOW, RICHARD. BRENNAN-JOBST, J. ANATOMY AND PHYSIOLOGY OF SPEECH AND HEARING. NEW YORK, THOMAS PUBLISHERS, 2018. P. 456.

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B. Answer the following questions.

1. How can weakened articulatory muscles affect speech intelligibility in individuals with motor neuron diseases?
2. Which motor neuron disease is specifically mentioned in the text, and what impact does it have on tongue function?
3. How do individuals with tongue weakness compensate for the inability to move their tongue effectively?
4. What effect does tongue weakness have on vowel production?
5. What does therapy typically involve for individuals with progressive motor neuron diseases affecting tongue function?

Context Exercises

A. Mark the statements True (T) or False (F).

1. ( ) The lingual frenulum connects the tongue to the roof of the mouth.
2. ( ) Ankyloglossia is a condition that affects the ability to move the tongue freely.
3. ( ) The main symptom of tongue-tie is a heart-shaped appearance of the tongue on protrusion.
4. ( ) A frenectomy is a surgical procedure used to correct a short, thick, or tight frenulum.
5. ( ) In amyotrophic lateral sclerosis (ALS), the tongue is often unaffected by the disease.

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6. ( ) People with motor neuron diseases may compensate for tongue weakness by moving their jaw more.
7. ( ) Therapy for neuromuscular diseases usually involves only medication and does not include communication methods.
8. ( ) The evidence for improvement in outcomes after a frenectomy is considered strong.
9. ( ) Individuals with weakened articulatory muscles may produce less distinct speech sounds.
10. ( ) Speech-language pathologists are sometimes asked to work with patients both before and after surgery for tongue-tie.

B. Read each answer carefully and ask questions for the given answers.

1. Question: _____?

Answer: The lingual frenulum connects the tongue to the floor of the mouth.

2. Question: _____?

Answer: Ankyloglossia is a condition that affects the ability to move the tongue freely.

3. Question: _____?

Answer: The main symptom of tongue-tie is a heart-shaped appearance of the tongue on protrusion.

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4. Question: _____?

Answer: A frenectomy is a surgical procedure used to correct a short, thick, or tight frenulum.

5. Question: _____?

Answer: In amyotrophic lateral sclerosis (ALS), the tongue is often impacted by the disease.

Vocabulary Study

A. Match the words with their correct meanings.

1. Frenulum	a) The ability to produce speech sounds and form words clearly.
2. Ankyloglossia	b) A condition where the tongue's movement is restricted.
3. Articulatory	c) A band of tissue connecting the tongue to the floor of the mouth.
4. Phonemes	d) Methods or tools used to enhance communication.
5. Augmentative	e) Basic units of sound in speech.

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B. Fill in the blanks with the appropriate words from the list below.

compensates articulatory frenectomy progressive intelligibility

1. A _____ procedure may be performed if the lingual frenulum is causing significant issues.
2. Individuals with weakened _____ muscles may have difficulty producing clear speech.
3. Tongue weakness often _____ by moving the jaw more.
4. Motor neuron diseases are often _____, meaning symptoms worsen over time.
5. The clarity and understandability of speech are referred to as _____.

Language Study: Can, May, May Be

These modal verbs used to express possibility, capability, necessity, or permission. Understanding how to use these modals helps in conveying different levels of certainty and ability.

1. **Can:** Expresses ability or possibility.
   - "A surgical procedure can be performed if necessary."
   - "Individuals can compensate for tongue weakness by moving their jaw more."

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2. **May:** Indicates permission or a possibility.
   - "Speech-language pathologists may be asked to work with these children."
   - "Tongue-tie may cause difficulty in producing certain speech sounds."
3. **May Be:** Suggests a possibility or likelihood.
   - "The evidence for improvement may be insufficient."
   - "The condition may be referred to as ankyloglossia."

A. Choose the correct modal verb (can, may, or may be) to complete each sentence.

1. The evidence for improvement in outcomes _____ low to insufficient.
   a. can
   b. may be
   c. may
2. Speech-language pathologists _____ work with children before or after surgery.
   a. may
   b. can
   c. may be
3. A surgical procedure _____ be performed if medically necessary.
   a. may
   b. may be
   c. can

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4. Tongue weakness _____ cause vowels to sound more like /ʌ/ than the intended target.
   a. may
   b. can
   c. may be
5. Patients _____ compensate for tongue weakness by moving their jaw more.
   a. may
   b. can
   c. may be

B. Complete the following sentences by choosing the appropriate modal verb (can, may, or may be) to convey the intended meaning.

1. With the new training program, employees _____ improve their performance significantly.
   a. may
   b. may be
   c. can
2. Due to the recent policy change, there _____ be some confusion among the staff.
   a. can
   b. may
   c. may be

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3. If you finish the project ahead of schedule, you _____ be able to take some extra time off.
   a. can
   b. may
   c. may be
4. The technician _____ fix the issue remotely if provided with the necessary details.
   a. may
   b. can
   c. may be
5. Based on the initial results, the problem _____ be more complex than anticipated.
   a. can
   b. may
   c. may be
6. The new software _____ offer additional features that were not available before.
   a. may
   b. may be
   c. can

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7. With enough practice, you _____ master the new technique in no time.
   a. may
   b. can
   c. may be
8. If the weather improves, the outdoor event _____ be held as planned.
   a. may
   b. can
   c. may be
9. Your feedback _____ help us enhance the user experience.
   a. may
   b. may be
   c. can
10. Given the current situation, the solution _____ require some adjustments.
    a. may be
    b. can
    c. may
11. There _____ be an increase in prices due to the new tax regulations.
    a. may be
    b. may
    c. can

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TARGET VOCABULARY

hearing, sound, perception, monitor, auditory system, transduce, neural signal, interpret, assess, manage, auditory pathway, listener, location, spoken communication



IMAGE MADE WITH GOOGLE AI

The Anatomy and Physiology of Hearing

Hearing is the perception of sound. As one of the five sensory systems, it plays an important role in our everyday lives by providing us with the ability to monitor our environment and by supporting spoken communication. The study of anatomy and physiology of hearing is essential to the understanding of how sound is transduced to a neural signal that the brain can interpret and of how auditory pathologies compromise hearing. The purpose of this chapter is to provide an important foundation regarding the nature of sound and the anatomy and physiology of the human ear, including the peripheral and central auditory systems.

The assessment and management of hearing require a basic understanding of how the peripheral auditory system transduces sound into a neural signal and how this neural signal is transmitted throughout the central auditory system. The study of the anatomy and physiology of the auditory system provides essential information about this transduction process, which is compromised in the presence of outer ear, middle ear, inner ear, and central auditory pathway pathologies. The processing of sound in the central auditory system involves a complex network of neural pathways that provide listeners with information to perceive both the content and the location of sounds in their environment.

ROUSSEAU BERNARD · BRANDO RYAN C., · ANATOMY AND PHYSIOLOGY OF SPEECH AND HEARING, NEW YORK, THIEME PUBLISHERS, 2018, P. 443

A. Answer the following questions.

1. What is the role of hearing in everyday life?
2. Why is the study of the anatomy and physiology of hearing important?
3. What is the main purpose of the chapter mentioned in the text?
4. What are the two main parts of the auditory system discussed in the text?
5. What kind of information does the central auditory system provide to listeners?

Context Exercises

A. Mark the statements True (T) or False (F).

1. ( ) Hearing is one of the five sensory systems.
2. ( ) The study of hearing only involves understanding the nature of sound.
3. ( ) The chapter aims to provide a foundation on the anatomy and physiology of the human ear.
4. ( ) The central auditory system is responsible for transducing sound into a neural signal.
5. ( ) Auditory pathologies do not affect the transduction process of sound in the auditory system.
6. ( ) The peripheral auditory system is involved in transmitting the neural signal.
7. ( ) Outer ear, middle ear, and inner ear pathologies can compromise hearing.
8. ( ) The central auditory system is responsible for providing information about the content and location of sounds.
9. ( ) The peripheral auditory system includes only the middle ear.
10. ( ) The study of auditory system anatomy and physiology is unnecessary for assessing hearing.

B. Ask questions for the given answers.

1. Question: _____?
Answer: Hearing is the perception of sound.

2. Question: _____?
Answer: It supports spoken communication and helps monitor our environment.

3. Question: _____?
Answer: The chapter provides a foundation on the nature of sound and the anatomy and physiology of the human ear.

4. Question: _____?
Answer: The peripheral auditory system transduces sound into a neural signal.

5. Question: _____?
Answer: The central auditory system provides listeners with information to perceive the content and location of sounds.

Vocabulary Study

A. Match the words on the left with their correct meanings on the right.

1. Transduction	a) The perception of sound
2. Neural	b) The process of converting one form of energy into another
3. Auditory	c) Relating to nerves or the nervous system
4. Perception	d) Related to the sense of hearing
5. Pathologies	e) The study of diseases

B. Complete the sentences using the correct word from the box.

function | anatomy | transduce | physiology | environment

1. Hearing plays an important role in our everyday lives by helping us monitor our _____.
2. The study of the _____ and _____ of hearing is essential to understanding how sound is transduced to a neural signal.
3. The chapter provides a foundation regarding the nature of sound and the _____ of the human ear.
4. The peripheral auditory system _____ sound into a neural signal.

C. Fill in the blanks with the correct form of the word in parentheses.

1. The _____ (assess) of hearing requires an understanding of the auditory system.
2. The study of hearing involves both the anatomy and _____ (physiological) of the auditory system.
3. _____ (communicate) is supported by our ability to hear.
4. Various _____ (pathology) can affect the auditory system.

Language Study: Passive Voice in Present Simple and Present Continuous

1. Passive Voice in the Present Simple:

Structure: Subject + am/is/are + past participle

In the present simple tense, the passive voice is used to describe actions that are regularly performed or general truths. The emphasis is on the action or the receiver of the action, rather than who performs the action.

Examples from the text:

- "Hearing **is perceived** as the ability to monitor our environment."
  - Explanation: The focus is on how hearing is understood, not who understands it.
- "Sound **is transduced** into a neural signal."
  - Explanation: The process of transduction is emphasized rather than who or what transduces the sound.

2. Passive Voice in the Present Continuous:

Structure: Subject + am/is/are + being + past participle

The passive voice in the present continuous tense describes actions that are currently happening but with an emphasis on the action itself rather than who is performing it.

Example Application (Hypothetical):

- "The auditory system is being studied by scientists to understand hearing better."
  - Explanation: The focus is on the ongoing study, not the scientists conducting it.

A. Rewrite the following active sentences in the passive voice, using either the present simple or present continuous tense as appropriate.

1. Researchers monitor the auditory system's responses.
_____

2. Audiologists assess hearing abilities in patients.
_____

3. Scientists are studying the effects of sound on the brain.
_____

4. The central auditory system processes the neural signals.
_____

5. Experts are examining how hearing is perceived.
_____

B. Convert the following active sentences into the passive voice, using either the present simple or present continuous tense as appropriate.

1. The chef prepares the meals.
_____

2. The company is launching a new product.
_____

3. The teacher is explaining the lesson.
_____

4. The engineers design the bridge.
_____

5. The marketing team is planning the campaign.
_____

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TARGET VOCABULARY

deafness, achievement, air conduction, audiologist, audiometer, bone conduction, hearing loss, hearing sensitivity, hearing threshold, inner ear, nasal signal, objective measure, subjective measure



IMAGE MADE WITH GOOGLE AI

Hearing Measurement

According to the World Health Organization (WHO, 2015), there are 360 million people with hearing loss. In children, hearing loss can interfere with the typical acquisition of spoken language, cognitive development, and academic achievement. In both children and adults, hearing loss can impact social relationships and lead to feelings of isolation and depression. Audiologists use a battery of objective and subjective measures to quantify hearing sensitivity. The traditional hearing test includes hearing threshold estimation for octave frequencies between 250 and 8000 Hz in each ear. A hearing threshold is the lowest intensity that can be perceived by the listener on a specific number of trials. By convention, lower thresholds represent better hearing sensitivity. Using a calibrated audiometer, sounds are presented to the ear via air conduction or bone conduction. In air conduction, sounds are introduced to the ear through sound waves. Sound can originate from a loudspeaker or from headphones.

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Audiologists typically prefer to use headphones during hearing tests because they enable testing of each ear somewhat independently. Airconducted sounds travel through the outer, middle, and inner ear before they are transduced into a neural signal at the junction of the inner hair cell and auditory nerve.

A. Answer the following questions.

1. According to the World Health Organization, how many people are reported to have hearing loss?
2. How can hearing loss affect children's language and cognitive development?
3. What are some social impacts of hearing loss in both children and adults?
4. What types of measures do audiologists use to quantify hearing sensitivity?
5. What does a hearing threshold represent in a traditional hearing test?

The perception of sound, however, can also be elicited through direct stimulation of the hearing organs through bone conduction. Bone conduction occurs when a bone oscillator is placed on the head. The oscillator transduces sound into a vibratory signal, which is subsequently transmitted to the skull. Because the inner ear is encased in the petrous portion of the temporal bone, it can be stimulated from these vibrations. There can be some contribution from the outer and middle ear during bone conduction, but the major contribution is through direct stimulation of the inner ear structures (see Musiek and Baran [2007] for additional reading on the mechanisms of bone conduction). When considered together, air conduction and bone conduction thresholds can provide a general location of ear pathology. Thresholds that are < 20 dB HL (15 dB HL for children) are considered to be normal. The dB HL (hearing level) scale is used in clinical audiometry to equate the average normal hearing sensitivity of dB SPL at each frequency. The use of dB HL is necessary because the human ear is not equally sensitive to all frequencies (see Durrant and Lovrinic [1995] for additional reading on the calculation of dB HL).

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A sensorineural hearing loss is defined as (1) air conduction thresholds that are > 20 dB HL; (2) bone conduction thresholds that are ≤ 20 dB HL; and (3) air and bone conduction thresholds that are within 10 dB of each other. These findings indicate that sound travels equally well via air conduction and bone conduction, and therefore the source of the hearing loss is within the inner ear, auditory nerve (cochlear branch of the vestibulocochlear nerve, CN VIII), or central auditory system. A conductive hearing loss is defined as (1) air conduction thresholds that are > 20 dB HL; (2) bone conduction thresholds that are < 20 dB HL; and (3) air and bone conduction thresholds that differ by ≥ 15 dB. These findings indicate that sound is transmitted more efficiently via bone conduction (i.e., when it bypasses the outer and middle ear). A conductive hearing loss most often results from outer and middle ear pathology. There is one exception, referred to as "third window lesions," which represents abnormal sound transmission within the inner ear. Additional testing is necessary to differentiate the site of lesion in these cases. A mixed hearing loss is defined as (1) air conduction thresholds that are > 20 dB HL; (2) bone conduction thresholds that are > 20 dB HL; and (3) air and bone conduction thresholds that differ by > 15 dB. These findings are suggestive of pathology impacting sound transmission in both air and bone conduction pathways. Mixed hearing loss results from pathology of the inner ear or auditory nerve as well as pathology within the outer and middle ears.

ROUSSEL-BERNARD, BRANDAN RYAN C., ANATOMY AND PHYSIOLOGY OF SPEECH AND HEARING, NEW YORK, TAYLOR PUBLISHERS, 2018, 21 Nov.

B. Answer the following questions.

1. What happens during bone conduction when a bone oscillator is placed on the head?
2. How does the inner ear respond to vibrations during bone conduction?
3. What does the dB HL scale measure in clinical audiometry?
4. How can air conduction and bone conduction thresholds help in diagnosing ear pathology?
5. What are the defining characteristics of sensorineural hearing loss according to the text?

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Context Exercises

A. Mark the statements True (T) or False (F).

1. ( ) According to WHO, there are 360 million people with hearing loss.
2. ( ) Hearing loss only affects children's spoken language acquisition.
3. ( ) A hearing threshold is the highest intensity that can be perceived by the listener.
4. ( ) Audiologists use only subjective measures to quantify hearing sensitivity.
5. ( ) Sounds in hearing tests are presented through air conduction only.
6. ( ) Headphones are preferred during hearing tests because they enable testing of both ears simultaneously.
7. ( ) Air-conducted sounds travel through the outer, middle, and inner ear.
8. ( ) Bone conduction directly stimulates the inner ear structures.
9. ( ) Bone conduction has no contribution from the outer and middle ear.
10. ( ) The inner ear is encased in the petrous portion of the temporal bone.

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B. Ask questions for the given answers.

1. Question: _____?

Answer: 360 million people.

2. Question: _____?

Answer: Hearing loss can interfere with the typical acquisition of spoken language in children.

3. Question: _____?

Answer: Feelings of isolation and depression.

4. Question: _____?

Answer: By using a calibrated audiometer.

5. Question: _____?

Answer: Bone conduction occurs when a bone oscillator is placed on the head.

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Vocabulary Study

A. Match the words on the left with their correct meanings on the right.

1. Audiometer — a) The lowest intensity that can be perceived by the listener
2. Threshold — b) The introduction of sound waves to the ear
3. Air Conduction — c) A device used to measure hearing sensitivity
4. Bone Conduction — d) The process where sound is transmitted via vibrations to the inner ear
5. Isolation — e) A state of being separated from others

B. Fill in the blanks with the words below.

Conduction | Audiometer | Isolation | Threshold | Bone conduction | Sensitivity

1. An audiologist uses a calibrated _____ to present sounds during a hearing test.
2. The _____ is the lowest intensity of sound that can be perceived.
3. _____ is the process where sound waves are introduced to the ear.
4. **Sense:** Audiologists assess hearing _____ using various measures.
5. During _____, a bone oscillator transduces sound into a vibratory signal.
6. Hearing loss can lead to feelings of _____ and depression.

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C. Complete the sentences by forming the correct word from the base word provided.

1. **Isolate:** Hearing loss can lead to social _____.
2. **Conduct:** The process of sound traveling through air is called air _____.
3. **Sense:** Audiologists assess hearing _____ using various measures.
4. **Stimulate:** Bone conduction directly _____ the inner ear structures.
5. **Vibrate:** The bone oscillator transduces sound into a _____ signal.

Language Study: Type Zero Conditionals

Type Zero Conditionals are used to express general truths, scientific facts, or situations that are always true if the condition is met. These conditionals are particularly common in technical and scientific texts, where the relationship between cause and effect is predictable and constant.

Structure: If + present simple, ... present simple

Used to describe situations where one action always (or most of the time) results in the same outcome.

Examples from the text:

In the context of the "Hearing Measurement" text, Type Zero Conditionals are used to explain the consistent and predictable relationships between hearing test conditions and their outcomes.

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Example 1: General Truth about Hearing Sensitivity

- **Text Example:** "If thresholds are < 20 dB HL, hearing is considered normal."
- **Explanation:** This sentence means that whenever thresholds are below 20 dB HL, the result is always that hearing is considered normal. This is a factual statement about how hearing sensitivity is assessed.

A. Convert the following non-conditional sentences into Type 0 Conditional sentences. Use "if" to combine the condition and result.

1. Water boils at 100 degrees Celsius.

_____

2. Plants grow well when they receive plenty of sunlight.

_____

3. Iron rusts when it is exposed to water and oxygen.

_____

4. When you heat ice, it turns into water.

_____

5. People get sunburned when they spend too much time in the sun without protection.

_____

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B. Complete the following sentences by filling in the blanks with the appropriate Type 0 Conditional rules. Use the correct form of the verbs provided in parentheses.

1. If you _____ (freeze) water, it _____ (turn) into ice.
2. If a magnet _____ (be) near a piece of iron, the iron _____ (become) magnetized.
3. If you _____ (mix) red and blue, you _____ (get) purple.
4. A plant _____ (die) if it _____ (not get) enough water.
5. If you _____ (press) the switch, the light _____ (come) on.

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TARGET VOCABULARY

Acute mastoiditis, acute suppurative hearing loss, autoimmune tube dysfunction, effusion, hearing threshold, inflammation, left Eustachian, mass, middle ear, ossicular chain, otitis media, otosclerosis, retraction pocket, tympanic membrane, tympanic cavity

Middle Ear Pathology

The balance of mass and stiffness within the middle ear space determines its efficiency to transmit sound between the outer ear and inner ear. This balance also determines the middle ear's resonant frequency, which is ~ 1000 Hz. A number of middle ear pathologies alter the mass and stiffness of the middle ear, resulting in changes primarily to the low and mid-range frequencies. Thus, different middle ear pathologies alter sound transmission in a frequency-specific manner. Let's examine a few examples.

Otitis media is an inflammation of the mucosal lining of the tympanic cavity of the middle ear. This inflammation is often the result of eustachian tube dysfunction, in which the eustachian tube is unable to equalize the pressure between the middle ear space and nasopharynx. Eustachian tube dysfunction results in a decrease in middle ear pressure, which disrupts the mucosal lining of the tympanic cavity. Otitis media may or may not present with effusion of fluid.

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Hearing loss is most often present in cases of otitis media with effusion (OME). Effusion of middle ear fluid increases OME's or infected (purulent OME). The extent to which OME affects sound transmission is dependent on the amount of fluid within the tympanic cavity and the location and the remaining air. If the fluid incompletely fills the tympanic cavity, there may be little to no change to hearing thresholds. As the amount of fluid increases, the tympanic membrane (TM) becomes stiffer, which increases the stiffness of the middle ear space resulting from eustachian tube dysfunction. The resulting hearing loss is a low-frequency conductive hearing loss. The accumulation of fluid within the tympanic cavity, however, adds both mass and stiffness to the system, resulting in a conductive hearing loss across the frequency range. It is important to note that the hearing loss associated with OME varies greatly between individuals due to differences in mass and stiffness of the middle ear system at each disease stage.

Chronic suppurative otitis media (colloquially) can result from trauma to the middle ear. These cases are characterized by a break at any point of attachment within the tympanic membrane system. Insudate/purulent (pus) discombobulate and the most common result of longitudinal temporal bone fractures. When the ossicular chain is disarticulated, there is a decrease in the stiffness of the middle ear system. The system becomes mass-dominated, which results in a decrease in the transmission of low-frequency sounds. This is a high-frequency conductive hearing loss, though the configurations can also be observed. (c) Otosclerosis, or otospongiosis, is a genetic metabolic disease of the temporal bone. It is characterized by abnormal bone remodelling in the tympanic cavity of the middle ear. Bone remodelling is a normal process by which bone renews itself. This phenomenon is due to the healthy remodelling between the bone that is built and lifts decade of life, resulting in abnormal bone growth. The new bone is often highly vascularized and fragile. Otosclerosis most often affects the anterior portion of the oval window footplate junction, whereby the stapes becomes fixed within the oval window. Stapes fixation results in an increase in stiffness of the middle ear system. In a stiffness-dominated system, transmission of low-frequency sounds is impaired. As the disease progresses, the additional bone adds mass to the system, which reduces the transmission of high-frequency sounds.

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As a result, patients with early stage otosclerosis exhibit low-frequency conductive hearing loss. Otosclerosis can also affect the cochlea, which can result in sensorineural hearing loss across the frequency range. Another hallmark of otosclerosis is a Carhart notch, which is a worsening of the bone conduction threshold at 2 kHz. This phenomenon is due to the pathology interfering with the ossicular chain's contribution to bone conduction.

REVISION NOTES FOR PHYSIOLOGY, ANATOMY AND PHYSIOLOGY OF SPEECH AND HEARING, NEW YORK, THEME PARK ENGINE, GIRL IT HAS

A. Answer the following questions.

1. What determines the efficiency of the middle ear in transmitting sound between the outer ear and inner ear?
2. How does otitis media with effusion (OME) affect hearing, and what are the two types of OME?
3. What is the most common result of longitudinal temporal bone fractures, and how does it affect hearing?
4. What is otosclerosis, and how does it affect hearing at different stages of the disease?
5. What is a Carhart notch, and in which condition is it observed?

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Context Exercises

A. Mark the statements True (T) or False (F).

1. ( ) The efficiency of the middle ear to transmit sound is determined solely by the mass of the middle ear space.
2. ( ) The resonant frequency of the middle ear is approximately 1200 Hz.
3. ( ) Eustachian tube dysfunction increases the pressure in the middle ear space.
4. ( ) Otitis media always presents with effusion of fluid.
5. ( ) Ossicular chain disarticulation often results in low-frequency conductive hearing loss.
6. ( ) Otosclerosis can lead to both low-frequency and high-frequency conductive hearing loss as the disease progresses.
7. ( ) Otitis media with effusion (OME) always leads to significant changes in hearing thresholds.
8. ( ) Stapes fixation in otosclerosis increases the stiffness of the middle ear system.
9. ( ) The Carhart notch is associated with a worsening of bone conduction thresholds at 2 kHz in patients with otosclerosis.
10. ( ) In cases of otitis media with effusion, hearing loss is typically more pronounced at high frequencies.

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B. Ask questions for the given answers.

1. Question: _____?
Answer: The balance of mass and stiffness within the middle ear space.

2. Question: _____?
Answer: Approximately 1200 Hz.

3. Question: _____?
Answer: A decrease in middle ear pressure.

4. Question: _____?
Answer: Hearing loss is most often present in cases of otitis media with effusion (OME).

5. Question: _____?
Answer: Insudate/purulent joint discontinuities.

6. Question: _____?
Answer: High-frequency conductive hearing loss.

7. Question: _____?
Answer: Otosclerosis.

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8. Question: _____?
Answer: Early-stage otosclerosis exhibits low-frequency conductive hearing loss, while late-stage otosclerosis exhibits conductive hearing loss across the frequency range.

9. Question: _____?
Answer: A Carhart notch.

10. Question: _____?
Answer: Increased stiffness of the middle ear space due to eustachian tube dysfunction.

Vocabulary Study

A. Match each word from the text with its correct meaning.

1. balance
2. frequency
3. unable
4. exhibit
5. chain

a) the rate at which something happens or is repeated
b) to have as a readily discernible quality or feature
c) a series of things linked, connected, or associated together
d) to not be able to do something
e) the ability to keep steady with an equal amount of weight on each side of the body

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B. Match each word from the text with its opposite.

1. decrease
2. temporal
3. early
4. low
5. common

a) high
b) permanent
c) late
d) rare
e) increase

Language Study: When

When as a conjunction of time introduces an adverbial clause, expressing when an action happens. Even if the placement of when-clause is changed, the meaning remains the same. However, if the when-clause comes before the main clause, we use a comma.

Examples from the text:
When the ossicular chain is disarticulated, there is a decrease in stiffness of the middle ear system.

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A. Combine each pair of sentences into one sentence using "when" as a conjunction. An example has been done for you.

0. Sentence: The middle ear's mass and stiffness are balanced. It efficiently transmits sound.
Combined: When the middle ear's mass and stiffness are balanced, it efficiently transmits sound.

1. Sentence: The eustachian tube fails to equalize pressure. Otitis media can develop.
Combined: _____

2. Sentence: Effusion fills the tympanic cavity. Hearing loss can occur.
Combined: _____

3. Sentence: There is a decrease in middle ear pressure. The mucosal lining can become disrupted.
Combined: _____

4. Sentence: The ossicular chain disarticulates. The system becomes mass-dominated.
Combined: _____

5. Sentence: Otosclerosis progresses. It can result in conductive hearing loss across the frequency range.
Combined: _____

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6. Sentence: The stapes is fixed within the oval window. Low-frequency sound transmission is impaired.
Combined: _____

7. Sentence: Fluid partially fills the tympanic cavity. There might be minimal impact on hearing thresholds.
Combined: _____

8. Sentence: There is trauma to the middle ear. It can lead to ossicular chain disarticulation.
Combined: _____

9. Sentence: Otosclerosis interferes with the ossicular chain. A Carhart notch can appear.
Combined: _____

Language Study: As

We can use the conjunction "as" to connect two actions or situations that happen at the same time.

Examples from the text:
As the disease progresses, the additional bone adds mass to the system, which reduces the transmission of high-frequency sounds.

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A. Combine each pair of sentences into one sentence using "as" to show cause, reason, or time. An example has been done for you.

0. Sentence: The middle ear's mass and stiffness are balanced. It efficiently transmits sound.
Combined: The middle ear efficiently transmits sound as its mass and stiffness are balanced.

1. Sentence: The eustachian tube fails to equalize pressure. Otitis media can develop.
Combined: _____

2. Sentence: Effusion fills the tympanic cavity. Hearing loss can occur.
Combined: _____

3. Sentence: There is a decrease in middle ear pressure. The mucosal lining can become disrupted.
Combined: _____

4. Sentence: The ossicular chain disarticulates. The system becomes mass-dominated.
Combined: _____

5. Sentence: Otosclerosis progresses. Conductive hearing loss can result across the frequency range.
Combined: _____

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6. Sentence: The stapes is fixed within the oval window. Low-frequency sound transmission is impaired.
Combined: _____

7. Sentence: Fluid partially fills the tympanic cavity. There might be minimal impact on hearing thresholds.
Combined: _____

8. Sentence: There is trauma to the middle ear. It can lead to ossicular chain disarticulation.
Combined: _____

9. Sentence: Otosclerosis interferes with the ossicular chain. A Carhart notch can appear.
Combined: _____



IMAGE MADE WITH GOOGLE AI

Otoacoustic Emissions (OAEs)

When OHCs change shape as their somatic motors operate, this motion itself produces sound waves that propagate in reverse direction even into the external auditory canal. A small and sensitive microphone can be placed in the auditory canal, and the emissions can be recorded. OAEs come in two primary varieties: spontaneous and evoked. Spontaneous emissions occur in the absence of external sound stimulation, while evoked emissions require a stimulus. The stimuli used for evoked emission are typically transient clicks and tones. OAEs are routinely tested in the clinical setting because they are noninvasive and easy to measure. They provide valuable information about the integrity of the inner ear and, more specifically, about OHC function. In addition, OAEs are utilized for newborn hearing screening programs that are designed to identify hearing loss in infants shortly after birth. All 50 states have implemented newborn hearing screening protocols within hospitals and birthing centers, and most OAE tests are performed prior to newborn discharge.

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The primary types of OAEs measured in the clinic are transient and distortion product emissions (TEOAEs and DPOAE, respectively). DPOAEs are elicited by using two tons of similar frequencies. When the inner ear is stimulated using these two tones, a new set of tones, referred to as intermodulation distortion tones, is generated by the inner ear and can be recorded in the ear canal. The most prominent distortion products occur at two times the frequency of the first tone (F1) minus the frequency of the second tone (F2), or 2F1 – F2. For example, if the frequency of tone 1 is 1,636 Hz and the frequency of tone 2 is 2,002 Hz, the inner ear distortion product will occur around 2 × 1,636 – 1,200 = 3,272 – 2,002 = 1,270 Hz. This provides frequency-specific information about the integrity of the OHC function of the inner ear. In fact, numerous reports have shown that lesions to inner hair cells (IHCs) have no effect on DPOAEs, further emphasizing that the frequency-specific loss of DPOAEs is intimately linked to the location of the damage along the organ of Corti.

ROUSSEAU BERNARD · BRANDON RYAN C., · ANATOMY AND PHYSIOLOGY OF SPEECH AND HEARING, NEW YORK, THEME PUBLISHERS, 2018, P. 456.

A. Answer the following questions.

1. What are the two primary varieties of OAEs?
2. How are OAEs tested in newborn hearing screening programs?
3. What is the role of OHCs in generating otoacoustic emissions?
4. How are DPOAEs elicited in a clinical setting?
5. Why is the measurement of DPOAEs valuable in diagnosing hearing loss?

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Context Exercises

A. Mark the statements True (T) or False (F).

1. ( ) OAEs can only be measured in the presence of an external sound stimulus.
2. ( ) DPOAEs provide frequency-specific information about the integrity of outer hair cells (OHCs).
3. ( ) Spontaneous emissions require a stimulus, such as transient clicks or tones, to occur.
4. ( ) All 50 states have implemented newborn hearing screening protocols that include OAE testing.
5. ( ) Lesions to inner hair cells (IHCs) have no effect on the measurement of DPOAEs.

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B. Ask questions for the given answers.

1. Question: _____?
Answer: OAEs can be recorded by placing a small, sensitive microphone in the auditory canal.
2. Question: _____?
Answer: Spontaneous emissions occur in the absence of external sound stimulation.
3. Question: _____?
Answer: Newborn hearing screening programs are designed to identify hearing loss in infants shortly after birth.
4. Question: _____?
Answer: DPOAEs are generated by stimulating the inner ear with two tones of similar frequencies.
5. Question: _____?
Answer: The most prominent distortion products occur at two times the frequency of the first tone minus the frequency of the second tone (2F1 – F2).

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Vocabulary Study

A. Match each word from the text with its correct meaning.

1. spontaneous	a) to get or produce something, especially information or a reaction
2. valuable	b) very useful or important
3. elicit	c) to cause something to be remembered or expressed
4. evoke	d) not planned but done because you suddenly want to do it
5. propagate	e) to travel through space or a material

B. Match each word from the text with its synonyms.

1. numerous	a) especially
2. specifically	b) plentiful
3. sensitive	c) highlight
4. emphasize	d) need
5. require	e) delicate

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Language Study: Reflexive Pronoun

We often use reflexive pronouns when the subject and the object of a verb are the same, or they can be used for emphasis. Reflexive pronouns are used in a situation that someone does something personally. We can use by + reflexive pronoun to mean alone.

Subject Pronoun	Reflexive Pronoun
I	Myself
You	Yourself
He	Himself
She	Herself
It	Itself
We	Ourselves
They	Themselves
You (plural)	Yourselves

Examples from the text:
When OHCs change shape as their somatic motors operate, this motion **itself** produces sound waves that propagate in reverse direction even into the external auditory canal.

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A. Fill in the blanks with the correct reflexive pronouns.

1. When outer hair cells (OHCs) change shape, they produce sound waves that propagate in reverse, even into the external auditory canal, by _____.
2. You can test OAEs in a newborn by placing a small and sensitive microphone in the ear canal, allowing the emissions to record _____.
3. The auditory system uses _____ to generate distortion product otoacoustic emissions (DPOAEs) in response to specific sound stimuli.
4. The hospital staff prided _____ on implementing newborn hearing screening protocols using OAEs before infant discharge.
5. Lesions to the inner hair cells (IHCs) do not affect the DPOAEs, showing that the outer hair cells (OHCs) handle the process _____.

B. Choose the correct reflexive pronoun to complete each sentence.

1. OAEs can occur spontaneously or evoked. The auditory system generates these emissions by _____.
   a. themselves
   b. itself
   c. ourselves
2. Researchers tested the equipment on _____ before using it in a clinical setting.
   a. themselves
   b. itself
   c. ourselves

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3. You should familiarize _____ with how otoacoustic emissions are recorded if you plan to work in audiology.
   a. ourselves
   b. yourself
   c. themselves
4. The equipment calibrates _____ after each OAE test to ensure accuracy.
   a. itself
   b. himself
   c. themselves
5. Outer hair cells (OHCs) protect _____ by producing sound waves that travel back through the ear.
   a. themselves
   b. itself
   c. herself

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TARGET VOCABULARY

action potential, anesthesia, auditory nerve, cochlea, electrode, electrocochleography (ECochG), hearing threshold, inner ear, Ménière's disease, response, sound stimulus, surgery, tympanic membrane, vestibulocochlear nerve



IMAGE MADE WITH GOOGLE AI

Inner Ear Potentials

The inner ear and auditory nerve electrical potentials can be measured and recorded in response to sound by a test called electrocochleography (or ECochG). This procedure is used clinically to assess the cochlear microphonic (CM) and summating potential (SP) of hair cells as well as the compound action potential (cAP) of the vestibulocochlear nerve. The most common clinical applications of ECochG include objective identification and monitoring of Ménière's disease. In addition, ECochG is used to monitor the peripheral auditory system during surgery to the auditory periphery, to enhance the Wave I component of the auditory brainstem response (ABR), and, more recently, in the diagnosis of auditory neuropathy/dyssynchrony. Typically, a noninvasive electrode is placed in the ear canal or on the tympanic membrane of the "suspected" ear. This electrode is often referred to as an extratympanic (ET) electrode. Other electrodes are placed on the top of the head (or forehead) and on the opposite ear.

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The ET electrode has an advantage of not causing pain or discomfort to the patient, compared to transtympanic (TT) needle electrodes, which, as the name implies, must pass through the tympanic membrane, requiring sedation, anesthesia, and medical supervision. The TT needle electrode is placed on the promontory wall of the middle ear, between the oval and round windows. As a result, it provides a clearer, more robust electrical response with larger amplitudes than ET electrodes do because the TT electrode is placed nearer the voltage generators in the cochlea and vestibulocochlear nerve. Thus, the noninvasive ET electrode does not require sedation, anesthesia, or medical supervision, but the overall responses are smaller in magnitude. The auditory signal used to generate the electrical potentials can be either clicks or tones. For clicks, the duration is usually 100 microseconds and the polarity can be rarefaction, condensation, or alternating. For tones, the duration can be short or long and frequency specific. When tones are used, the CM is the alternating current voltage that mirrors the frequency of the tone. It is dominated by the outer hair cell and is proportional to the displacement of the basilar membrane. The SP is the stimulus-related potential of the cochlea and is often referred to as the direct current voltage response of the inner hair cells as they move in combination with the basilar membrane movement. Finally, the cAP represents the summed neural response of the synchronous action potential firing of vestibulocochlear nerve fibers. The cAP is the largest potential of the ECochG and is identical to Wave I of the ABR. The clinical use of the ECochG is in the diagnosis of Ménière's disease. It is also used in differentiating between cochlear and retrocochlear deficits and in estimating hearing thresholds in difficult-to-test populations. The diagnosis of Ménière's disease is made when the SP is unusually large compared to the cAP, resulting in an SP/AP ratio that is more than 40% of the cAP. Although the criteria for abnormality are not universal, it is generally agreed upon that SPs larger than 40 to 50% of the cochlea and is often referred to as Ménière's disease. However, it should be noted that if the patient is asymptomatic at the time of testing, the SP/AP is, more often than not, normal. In differentiating between cochlear and retrocochlear deficits, ECochG has proven useful, especially in individuals with auditory neuropathy/dyssynchrony, a relatively newly described disorder.

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Individuals with auditory neuropathy/dyssynchrony present with a wide range of symptoms, including mild to moderate hearing loss and severely impaired speech understanding in both quiet and noisy environments. One diagnostic indicator is the presence of the CM but abnormal or absent cAP, suggesting normal OHC function with abnormal vestibulocochlear nerve function.

MUSIGEK BERNARD, BRANDA RYAN C., ANATOMY AND PHYSIOLOGY OF SPEECH AND HEARING, NEW YORK, THIEME PUBLISHERS, 2018, P. 468.

A. Answer the following questions.

1. What is electrocochleography (ECochG) used to assess?
2. What are the most common clinical applications of ECochG?
3. What is the difference between extratympanic (ET) and transtympanic (TT) electrodes in ECochG?
4. How is the diagnosis of Ménière's disease made using ECochG?
5. What does the presence of cochlear microphonic (CM) with an abnormal or absent compound action potential (cAP) suggest?

Context Exercises

A. Mark the statements True (T) or False (F).

1. ( ) The transtympanic (TT) electrode requires sedation or anesthesia.
2. ( ) ECochG is used to monitor the central auditory system during surgery.
3. ( ) Ménière's disease is diagnosed when the compound action potential (cAP) is unusually large compared to the summating potential (SP).
4. ( ) The cochlear microphonic (CM) is dominated by inner hair cells (IHCs).
5. ( ) The SP/AP ratio that is more than 40% of the cAP is highly specific for Ménière's disease.

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B. Ask questions for the given answers.

1. Question: _____?

Answer: Electrocochleography (ECochG) is used to assess the cochlear microphonic (CM), summating potential (SP), and compound action potential (cAP).

2. Question: _____?

Answer: The clinical applications of ECochG include the identification and monitoring of Ménière's disease and auditory neuropathy/dyssynchrony.

3. Question: _____?

Answer: The transtympanic (TT) electrode requires sedation or anesthesia but provides clearer and stronger responses.

4. Question: _____?

Answer: The diagnosis of Ménière's disease is made when the SP is unusually large compared to the cAP, resulting in an SP/AP ratio of more than 40%.

5. Question: _____?

Answer: The presence of CM with an abnormal or absent cAP suggests normal OHC function but abnormal vestibulocochlear nerve function.

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Vocabulary Study

A. Match each word from the text with its correct meaning.

1. threshold — a) not severe or strong
2. patient — b) a constituent part
3. mild — c) a person who is receiving medical treatment, especially in a hospital
4. component — d) a decrease in the density of air or a gas
5. rarefaction — e) the level at which something starts to happen or have an effect

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B. Fill in the table below.

Noun	Adjective	Verb	Adverb
stimulation		stimulate	X
	synchronous		
		function	functionally
diagnosis			X
	measured		X
		X	peripherally
surgery		X	

C. Use the words below to fill in the blanks in the sentences.

peripheral | surgical | function | stimulate | synchronized

1. The outer hair cells are responsible for the _____ of the cochlea and contribute to the generation of electrical signals.
2. During ECochG testing, clicks or tones are used to _____ the auditory system and generate electrical potentials.
3. The extratympanic (ET) electrode is preferred in many cases because it does not require _____ procedures.
4. The _____ auditory system is often monitored during ECochG testing to ensure no damage occurs during _____ procedures.

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Language Study: However

The most common way of using 'however' is to mean 'but'. Using the word 'however' in a sentence serves as a way to show contrast or present opposing ideas.

Examples from the text:

Although the criteria for abnormality are not universal, it is generally agreed upon that SPs larger than 40 to 50% of the cAP yield are highly specific for Ménière's disease. **However**, it should be noted that if the patient is asymptomatic at the time of testing, the SP/AP is, more often than not, normal.

A. For each of the following sentences, rewrite it to include the word 'however' to show contrast between the two ideas.

Example:

- Original: The extratympanic (ET) electrode is less invasive. It provides smaller responses.
- Rewritten: The extratympanic (ET) electrode is less invasive; however, it provides smaller responses.

1. ECochG is noninvasive. It can sometimes miss subtle hearing issues.

_____

2. The TT electrode provides a clearer response. It requires more preparation and patient discomfort.

_____

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3. Auditory neuropathy/dyssynchrony can be diagnosed with ECochG. Other types of hearing loss may not be as easily diagnosed.

_____

4. The summating potential (SP) is large in patients with Ménière's disease. The compound action potential (cAP) may be normal.

_____

5. ECochG is helpful for monitoring the auditory system during surgery. It may not be useful for diagnosing every hearing condition.

_____

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IMAGE MADE WITH GOOGLE AI

Anatomy of Swallowing and Mastication

The functions of swallowing and mastication share significant neuroanatomic and physiologic substrates with speech production. Swallowing is a sensorimotor function relying highly on afferent information generated throughout the swallowing mechanism, which then shapes the efferent motor control of the swallowing sequence. In brief, the swallowing sequence consists of four general phases: the oral-preparatory, oral, pharyngeal, and esophageal phases. The successful completion of these phases requires a widely distributed neural network providing flexibility in the motor control of swallowing. In general, the sensorimotor control of swallowing includes various neuroanatomic substrates: (1) sensory receptors inthe oral, laryngeal, pharyngeal, and esophageal mucosa, (2) multiple cranial and spinal nerves that provide afferent and efferent information, (3) brainstem central pattern generators (CPGs), (4) cortical regions, (5) subcortical regions including the motor control systems (basal ganglia and cerebellum), and, finally, (6) over 25 swallowing muscles.

The complex sensorimotor control of swallowing will be discussed in much more detail later in this chapter. In this section, we will review the structures constituting the anatomic framework, the muscles that act on this framework, and the neural substrates controlling the successful transport of food and liquid from the oral cavity through the pharynx, past a closed laryngeal vestibule, and into the esophagus.

Swallowing consists of four stages: the oral-preparatory, oral, pharyngeal, and esophageal stages. In the oral-preparatory phase, the food, liquid, or saliva is formed into a cohesive bolus and made ready to be swallowed. During the oral phase, the bolus is moved posteriorly in the mouth to the oropharynx. To accomplish this movement, the tip of the tongue is elevated toward the superior alveolar ridge while the soft palate elevates to seal off the nasal cavity, and the posterior tongue depresses (Dodds et al 1990). The bolus is then propelled to the oropharynx as the tongue pushes the bolus posteriorly (Dodds et al 1990). The pharyngeal stage is also defined by a series of airway protective maneuvers including closure of the laryngeal complex, which involves three major events: (1) closure of the true vocal folds, (2) closure of the false vocal folds, and (3) inversion of the epiglottis. Simultaneously, the PE segment relaxes (opens), and the bolus is then delivered into the esophagus. Effective swallowing involves a rapid sequence of neuromuscular movements within a series of overlapping phases that create pressure gradients to ensure that a bolus is delivered safely and efficiently to the esophagus and, eventually, the stomach (Fig. 14.19). Therefore, changes in one phase of swallowing will result in changes to subsequent phases. This relationship becomes increasingly important when we think about dysphagia and its impact on swallowing physiology.

ROUSSEAU-BERNARD -BRANSKI RYAN C., ANATOMY AND PHYSIOLOGY OF SPEECH AND HEARING, NEW YORK, THIEME PUBLISHERS, 2018, P. 484

A. Answer the following questions.

1. What are the four general phases of the swallowing sequence?
2. What are the primary neural substrates involved in the sensorimotor control of swallowing?
3. Describe the function of the tongue during the oral phase of swallowing.
4. What are the three major events involved in the closure of the laryngeal complex during the pharyngeal stage?
5. How does a change in one phase of swallowing affect the subsequent phases?

Context Exercises

A. Mark the statements True (T) or False (F).

1. ( ) Swallowing involves five phases: oral-preparatory, oral, pharyngeal, esophageal, and gastric.
2. ( ) The oral-preparatory phase involves forming the bolus and making it ready to be swallowed.
3. ( ) During the pharyngeal stage, the epiglottis is inverted to protect the airway
4. ( ) The bolus is moved from the oral cavity to the esophagus by a single neuromuscular movement.
5. ( ) Swallowing physiology does not change significantly with dysphagia.

B. Ask questions for the given answers.

1. Question: _____?

Answer: The four general phases of the swallowing sequence are the oral-preparatory, oral, pharyngeal, and esophageal phases.

2. Question: _____?

Answer: The primary neural substrates involved in the sensorimotor control of swallowing include sensory receptors, cranial and spinal nerves, brainstem central pattern generators, cortical and subcortical regions, and over 25 swallowing muscles.

3. Question: _____?

Answer: During the oral phase of swallowing, the tongue elevates towards the superior alveolar ridge, the soft palate elevates to seal off the nasal cavity, and the posterior tongue depresses to move the bolus posteriorly.

4. Question: _____?

Answer: The three major events involved in the closure of the laryngeal complex are the closure of the true vocal folds, closure of the false vocal folds, and inversion of the epiglottis.

5. Question: _____?

Answer: Changes in one phase of swallowing can affect subsequent phases, which is important for understanding the impact of dysphagia.

Vocabulary Study

A. Match each word from the text with its correct meaning.

1. swallowing	a) better in quality than somebody/something else; greater than somebody/something else
2. superior	b) to have something in common with
3. accomplish	c) to take through the mouth and esophagus into the stomach
4. ensure	d) to make sure that something happens or is definite
5. overlapping	e) to succeed in doing or completing something

B. Match each word from the text with its synonym.

1. rapid	a) defensive
2. eventually	b) fast
3. involve	c) finally
4. protective	d) send
5. propel	e) contain

Language Study: Will

When we talk or write about plans, expectations, schedules, and predictions, we often use the simple future tense. The simple future tense is formed using the auxiliary verb "will" with a main verb.

Examples from the text:

Therefore, changes in one phase of swallowing **will** result in changes to subsequent phases

A. Read the sentences below and determine if will is used to express a prediction, intention, or plan. Write the correct usage next to each sentence.

1. The text will cover the anatomy of the swallowing mechanism. _____
2. Researchers will likely find new methods for studying swallowing. _____
3. We will need to consider the impact of dysphagia on swallowing physiology. _____
4. The chapter will provide an overview of the swallowing phases. _____
5. She will address the importance of neural control in the next section. _____

B. Write sentences with will according to the given headings. An example has been done for you.

Example:

- A decision to review the text further: **I will review the text again to understand the complex control of swallowing.**

1. A prediction about future research on swallowing:

_____

2. An intention to study the phases of swallowing:

_____

3. A plan to address swallowing issues in the clinic:

_____

4. A promise to discuss the swallowing process with a colleague:

_____

The Content-Based Language Teaching Approach—one of the effective methods frequently used in English for Specific Purposes (ESP) courses—and, in particular, the Topic-Based Teaching Model, aim to develop students' language skills in professional and academic contexts by focusing on situations they will encounter in the real world. This approach assumes that language teaching must be tailored to the specific language and communication needs of individual students and that particular attention must be paid to the context in which they use English.

The series of subject-specific English textbooks produced by the School of Foreign Languages at Cappadocia University has been developed to support students' English reading skills—which they will need in their academic and professional lives—through reading passages adapted to their respective fields.

The reading texts, vocabulary exercises, practical activities and key language structures provided for revision in the book are designed to develop students' reading, comprehension, interpretation and communication skills in tandem. The numerous text analyses and vocabulary exercises enable students to understand the academic terminology and reading passages they encounter in their current academic lives.

These books aim to serve as a guide for students and can be used as a reliable reference both during their university studies and after graduation.

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