

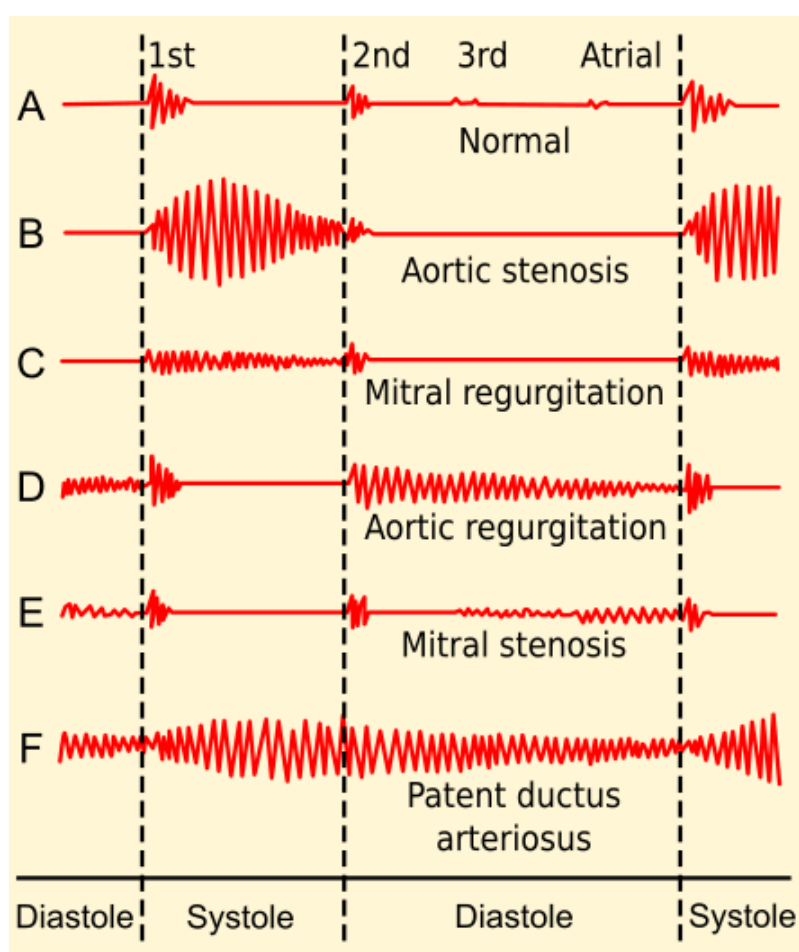
WEEK 8: Nursing Management of Patients with Cardiovascular Disorders.

- Assessment and signs and symptoms and diagnostic test
- Valvular heart disease (Aortic stenosis and regurgitation)
- Valvular heart disease (Mitral disease stenosis and regurgitation)
- Congenital heart disease (ASD, VSD and TOF).
- Cardiac catheterization

Valvular Heart Disease

Valvular heart disease encompasses any cardiovascular pathology affecting one or more of the heart's four valves: the aortic and mitral valves on the left side, and the pulmonic and tricuspid valves on the right.

This condition is often age-related but can also stem from congenital abnormalities, specific diseases, or physiological processes, including rheumatic heart disease and pregnancy.



Phonocardiogram of normal and abnormal heartbeats.

Classification

Valvular heart diseases are primarily categorized into stenosis and insufficiency/regurgitation. Stenosis refers to the narrowing of the valve orifice, impeding adequate blood outflow. Insufficiency or regurgitation denotes the valve's inability to prevent backflow, resulting from improper leaflet closure.

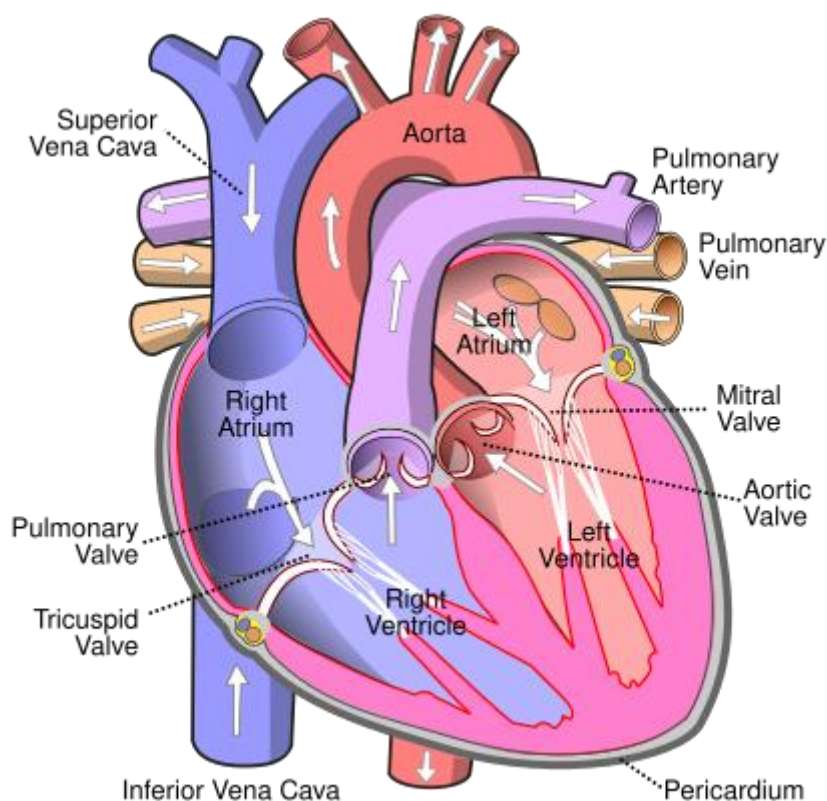


Diagram showing the valves of the heart.

Signs and Symptoms

Aortic Stenosis

Aortic stenosis manifests with symptoms of heart failure such as dyspnea on exertion, orthopnea, paroxysmal nocturnal dyspnea, angina pectoris, and exertional syncope. Medical signs include diminished and delayed carotid pulse, fourth heart sound, decreased A2 sound, sustained apex beat, and a systolic murmur heard in the 2nd right intercostal space radiating to the carotid arteries.

Aortic Regurgitation

Patients may experience dyspnea on exertion, orthopnea, paroxysmal nocturnal dyspnea, palpitations, and angina pectoris. Signs include increased pulse pressure, diastolic decrescendo murmur, water hammer pulse, Austin Flint murmur, and a third heart sound.

Mitral Stenosis

Mitral stenosis presents with dyspnea on exertion, orthopnea, paroxysmal nocturnal dyspnea, palpitations, chest pain, hemoptysis, thromboembolism, or signs of right-sided heart failure. Auscultation reveals a loud S1, an opening snap, and a low-pitched diastolic rumble.

Mitral Regurgitation

Symptoms include dyspnea on exertion, orthopnea, paroxysmal nocturnal dyspnea, palpitations, or pulmonary oedema. Auscultation may reveal a holosystolic murmur at the apex, a third heart sound, and atrial fibrillation.

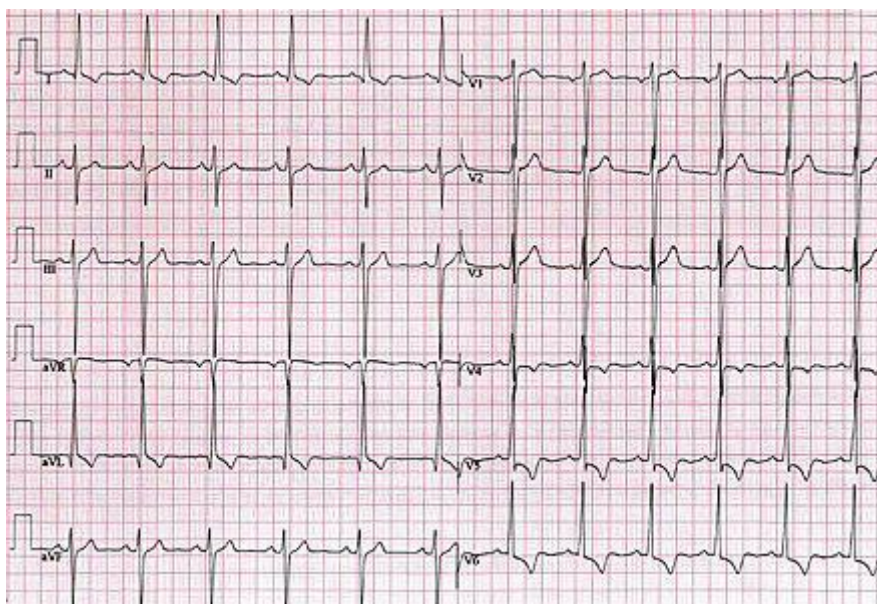
Tricuspid Regurgitation

Patients may experience ascites, hepatomegaly, oedema, and jugular venous distension. Signs include a pulsatile liver, prominent V waves, rapid y descents in jugular venous pressure, and a holosystolic murmur.

Diagnosis

Aortic Stenosis

Diagnosis involves chest X-ray showing aortic dilation and echocardiography revealing left ventricular hypertrophy, leaflet calcification, and abnormal leaflet closure.



ECG showing left ventricular hypertrophy, these findings may be present in aortic stenosis.

Aortic Regurgitation

Chest X-ray may show aortic root dilation and apex displacement. Echocardiography is very important for identifying aortic root dilation, and regurgitant fraction (RF) is used to classify severity.

Mitral Stenosis

Chest X-ray can reveal an enlarged left atrium and pulmonary vein dilation. Echocardiography estimates pulmonary artery systolic pressure and visualises leaflet calcification and the pressure gradient.

Mitral Regurgitation

Chest X-ray may show an enlarged left atrium and pulmonary venous congestion. Echocardiography visualizes regurgitant flow and calculates RF.

Treatment

Aortic Stenosis

Treatment involves aortic valve replacement (AVR) surgery for severe and symptomatic cases. AVR can be performed using mechanical or tissue valves, or via Trans-catheter Aortic Valve

Implantation (TAVI) in high-risk patients. Monitoring with echocardiography is essential in non-severe cases.

Aortic Regurgitation

Treatment includes aortic valve replacement for symptomatic severe cases and chronic severe cases with left ventricular ejection fraction less than 50%. Hypertension is managed with calcium channel blockers, ACE inhibitors, or ARBs.

Mitral Stenosis

Percutaneous balloon mitral valvuloplasty (PBMV) is recommended for symptomatic severe cases. Anticoagulation is indicated in the presence of atrial fibrillation or a previous embolic event. Diuretics may be used for pulmonary congestion.

Mitral Regurgitation

Surgical repair is preferred over replacement for severe cases. Medical management includes vasodilators, diuretics, digoxin, antiarrhythmics, and chronic anticoagulation.

Epidemiology

In the United States, about 2.5% of the population has moderate to severe valvular heart disease, with prevalence increasing with age. Rheumatic heart disease is the most common cause in underdeveloped regions, accounting for up to 65% of valve disorders.

Aortic Stenosis

This condition is primarily age-related, affecting 12.4% of those over 75. Bicuspid aortic valves are found in up to 1% of the population.

Aortic Regurgitation

Its prevalence increases with age, affecting 13% of those aged 55 to 86. It is often caused by aortic root dilation or infective endocarditis.

Mitral Stenosis

Almost exclusively caused by rheumatic heart disease, its prevalence is about 0.1% in the United States and is the most common valvular heart disease in pregnancy.

Mitral Regurgitation

This condition is significantly associated with ageing, affecting over 9% of those over 75.

Special Populations

Pregnancy

Valvular heart disease in pregnancy poses risks to both the mother and fetus due to physiological changes such as increased cardiac output and decreased systemic vascular resistance. Severe conditions like aortic stenosis, mitral stenosis, and mechanical prosthetic valves requiring anticoagulation are particularly high-risk during pregnancy.

Self-assessment MCQs (select the best answer)

1. Which of the following heart valves is located on the right side of the heart?

- a. Aortic valve
 - b. Mitral valve
 - c. Pulmonic valve
 - d. Tricuspid valve
 - e. Both C and D
- 2. Which of the following symptoms is NOT commonly associated with aortic stenosis?**
- a. Dyspnea on exertion
 - b. Orthopnea
 - c. Paroxysmal nocturnal dyspnea
 - d. Ascites
 - e. Angina pectoris
- 3. Which diagnostic tool is very important for identifying the extent of left ventricular hypertrophy in aortic stenosis?**
- a. Chest X-ray
 - b. Echocardiography
 - c. MRI
 - d. CT scan
 - e. Blood tests
- 4. What is the primary cause of mitral stenosis in the United States?**
- a. Atherosclerosis
 - b. Congenital abnormalities
 - c. Hypertension
 - d. Rheumatic heart disease
 - e. Infective endocarditis
- 5. Which treatment is recommended for severe symptomatic mitral stenosis?**
- a. Diuretics
 - b. Anticoagulation
 - c. Percutaneous balloon mitral valvuloplasty (PBMV)
 - d. ACE inhibitors
 - e. Digoxin
- 6. Which of the following is a common sign of tricuspid regurgitation?**
- a. Pulsatile liver
 - b. Decreased A2 sound
 - c. Opening snap
 - d. Austin Flint murmur
 - e. Water hammer pulse
- 7. Which valve disorder involves the inability of the valve to prevent backflow of blood?**
- a. Stenosis
 - b. Insufficiency
 - c. Hypertrophy
 - d. Prolapse
 - e. Fibrosis
- 8. Which valvular disease is most commonly associated with ageing and affects over 9% of those over 75?**
- a. Aortic stenosis
 - b. Aortic regurgitation
 - c. Mitral stenosis

- d. Mitral regurgitation
- e. Tricuspid stenosis

9. What is the most common cause of aortic regurgitation?

- a. Aortic root dilation
- b. Rheumatic fever
- c. Congenital bicuspid aortic valve
- d. Mitral valve prolapse
- e. Pulmonary hypertension

10. Which of the following treatments is preferred for chronic severe mitral regurgitation?

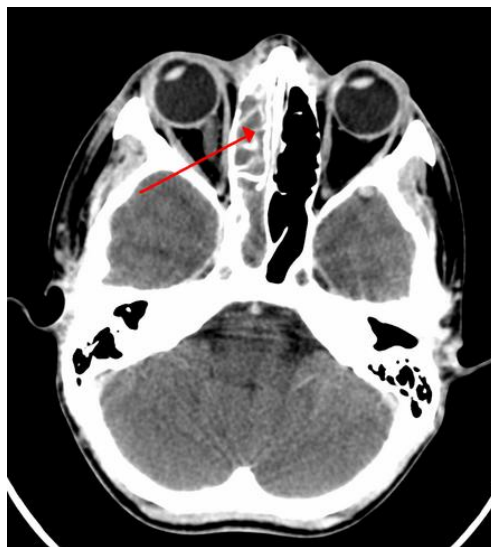
- a. Valve replacement
- b. Valve repair
- c. Diuretics
- d. Calcium channel blockers
- e. Anticoagulation

WEEK 9: Nursing Management of Patients With, Nose and Throat (ENT) Disorders

- Sinusitis
- Tonsillitis
- Otitis media
- Ca larynx

Sinusitis

Sinusitis, also known as rhinosinusitis, is an inflammation of the mucous membranes that line the sinuses, leading to symptoms such as thick nasal mucus, a plugged nose, and facial pain. It is commonly seen in individuals with underlying conditions such as allergies or structural nasal problems, and those with lower immunity. Most cases are caused by viral infections, but bacterial and fungal infections can also be culprits.



A CT scan showing sinusitis of the ethmoid sinus

Signs and Symptoms

The primary symptoms of sinusitis include headache, facial pain, or pressure, particularly over the affected sinuses, which can worsen when bending over or lying down. Acute sinusitis may present with a thick, green nasal discharge possibly containing pus or blood. Localized headaches, toothaches, and postnasal drip are also common. Chronic sinusitis can lead to symptoms like nasal congestion, facial pain, night-time coughing, and an increased severity of asthma symptoms. Additionally, anosmia (loss of smell) is frequently observed in chronic cases.

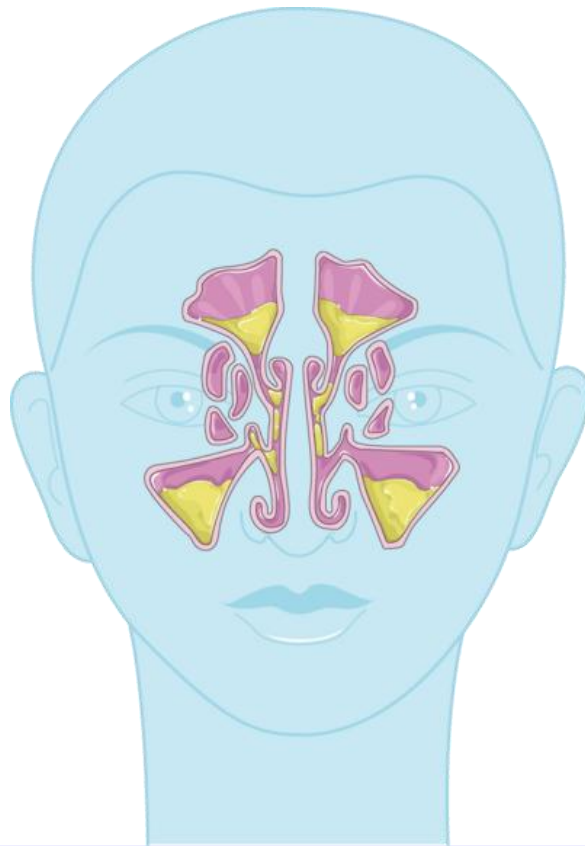
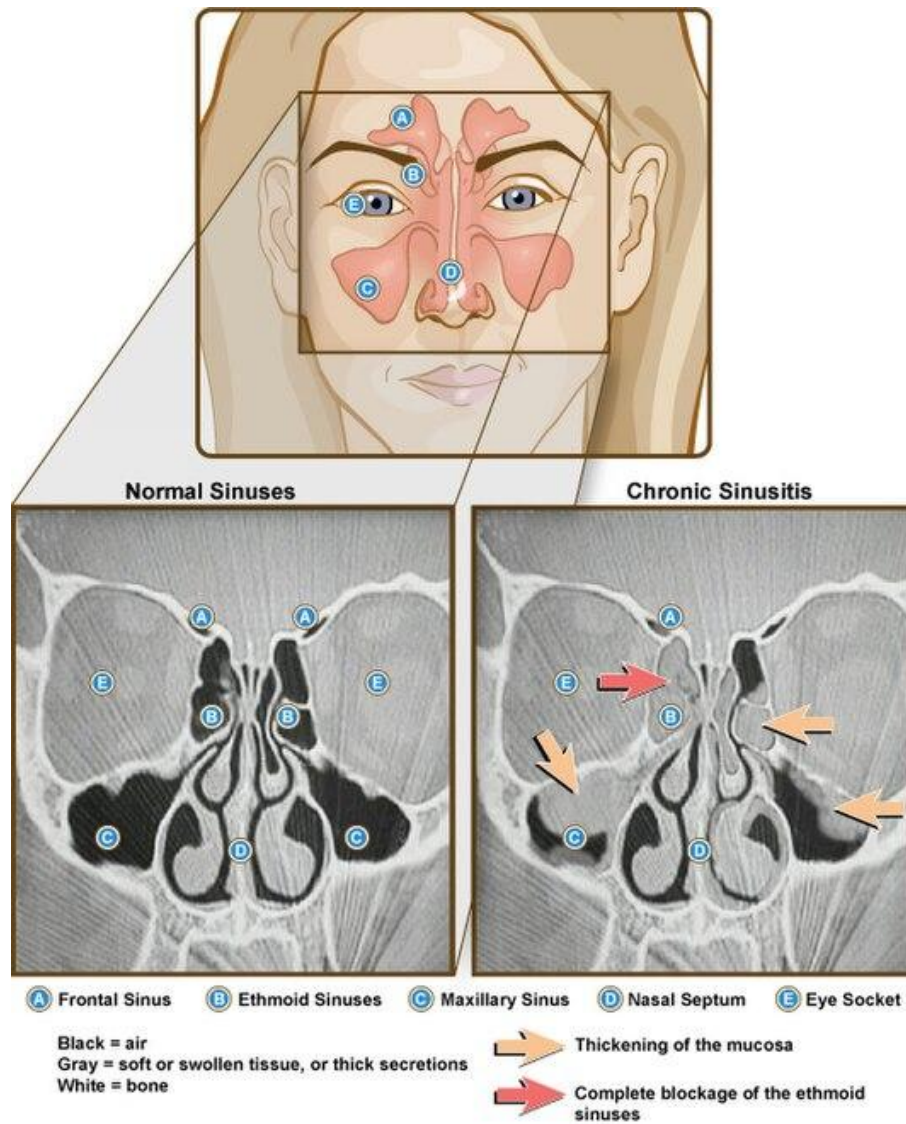


Illustration depicting sinusitis, note the fluid in the sinuses

Diagnosis

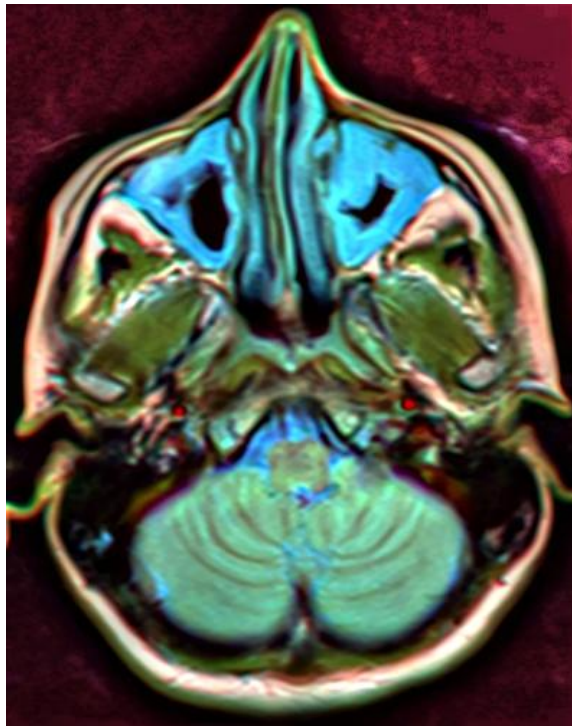
Sinusitis is classified into several categories based on duration and recurrence: acute (up to four weeks), subacute (4-12 weeks), chronic (over 12 weeks), and recurrent acute (four or more episodes per year). Diagnosis is typically based on symptoms, but imaging studies like CT scans or MRIs may be used for chronic cases or when complications are suspected.



CT of chronic sinusitis



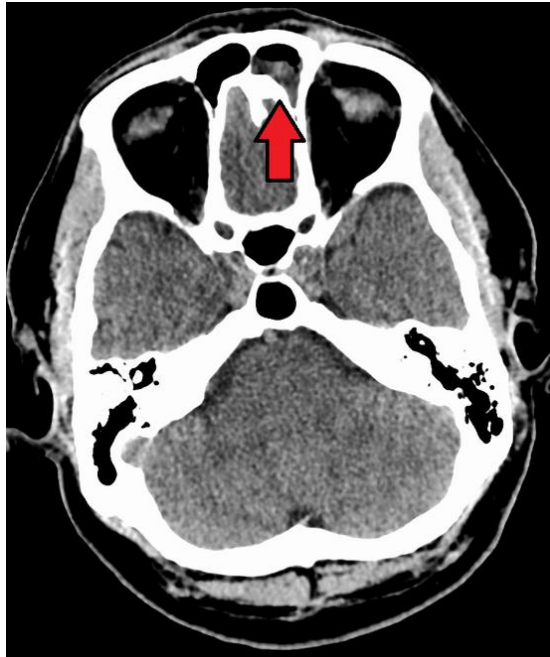
CT scan of chronic sinusitis, showing a filled right maxillary sinus with sclerotic thickened bone



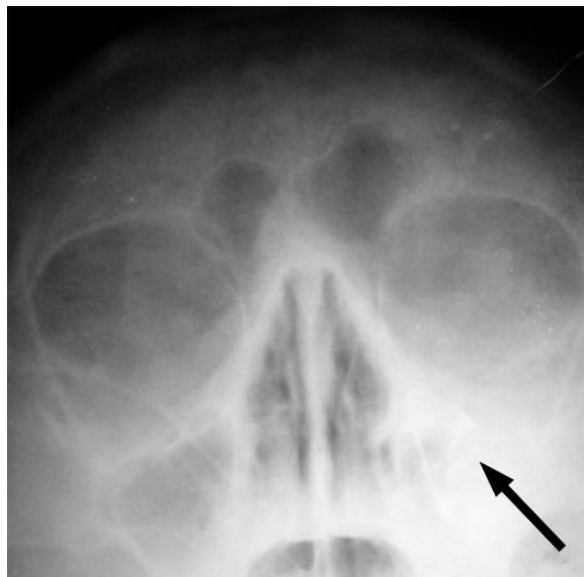
MRI image showing sinusitis. Oedema and mucosal thickening appears in both maxillary sinuses



Maxillary sinusitis caused by a dental infection associated with periorbital cellulitis



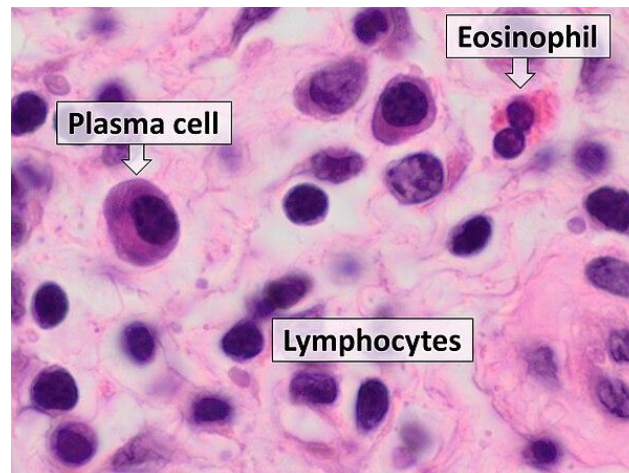
Frontal sinusitis



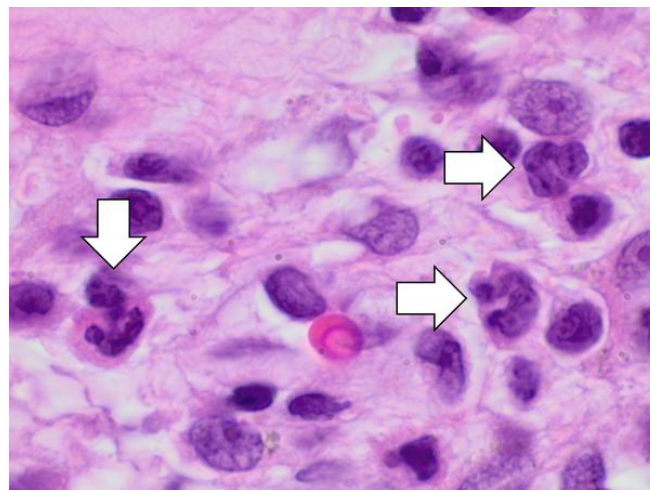
X-ray of left-sided maxillary sinusitis marked by an arrow. There is lack of the air transparency indicating fluid in contrast to the other side.

Treatment

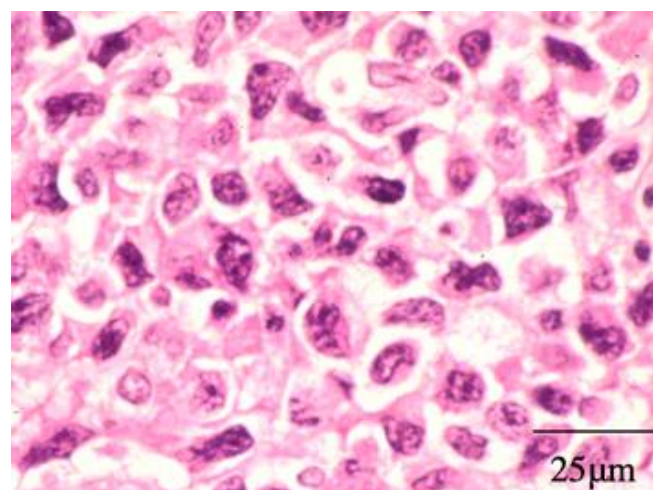
Treatment for sinusitis varies depending on the cause and severity. For most cases, rest and hydration are recommended. Nasal irrigation can help relieve congestion, while decongestant nasal sprays may offer temporary relief. Antibiotics are generally reserved for bacterial sinusitis that does not improve within 10 days or worsens. Amoxicillin or amoxicillin/clavulanate is typically the first line of antibiotic treatment, with the latter being slightly more effective.



Benign chronic mixed inflammation of an inflammatory sinonasal polyp



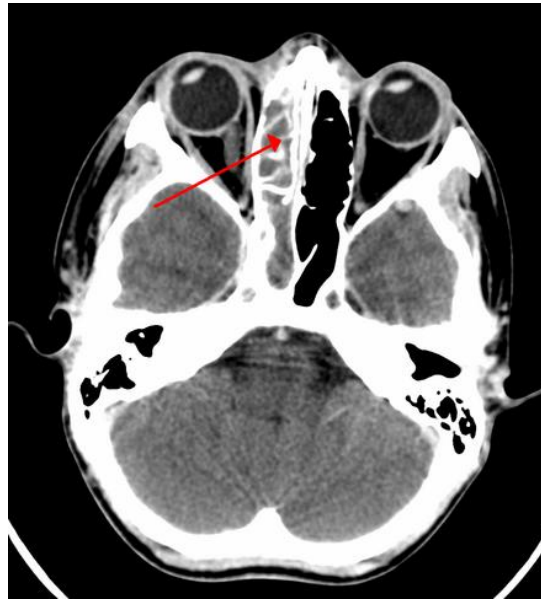
Acute inflammation characterised by neutrophils



Extranodal NK/T cell lymphoma, nasal type. It may be incidentally discovered in people undergoing surgery for sinusitis.

Nasal corticosteroids may be useful for reducing inflammation, particularly in chronic sinusitis. Surgery, such as Functional Endoscopic Sinus Surgery (FESS) or balloon

sinuplasty, may be considered for chronic or recurrent cases that do not respond to medical treatments.



A CT scan showing sinusitis of the ethmoid sinus

Complications

Complications of sinusitis, although rare, can be severe. These include orbital cellulitis, brain abscesses, and meningitis. Early diagnosis and treatment are very important for preventing such outcomes. Chronic sinusitis may also lead to chronic mouth breathing, increasing the risk of gingivitis.

Epidemiology

Sinusitis is prevalent, affecting between 10% and 30% of people each year in the developed world. Chronic sinusitis affects about 12.5% of people, leading to significant healthcare costs. The condition is commonly mismanaged with unnecessary antibiotic treatments for viral infections, contributing to antibiotic resistance.

Self-assessment MCQs (select the best answer)

- 1. What is the primary cause of most sinusitis cases?**
 - a. Bacterial infections
 - b. Fungal infections
 - c. Viral infections
 - d. Allergies
 - e. Structural nasal problems
- 2. Which of the following is a common symptom of chronic sinusitis?**
 - a. Acute headache
 - b. Green nasal discharge
 - c. Night-time coughing
 - d. Sudden toothache
 - e. Ear pain
- 3. How long does acute sinusitis typically last?**
 - a. Up to 2 weeks
 - b. 4 to 12 weeks

- c. Up to 4 weeks
 - d. Over 12 weeks
 - e. More than 6 months
- 4. Which imaging study is commonly used for diagnosing chronic sinusitis?**
- a. X-ray
 - b. Ultrasound
 - c. CT scan
 - d. PET scan
 - e. DEXA scan
- 5. What is the first line of antibiotic treatment for bacterial sinusitis?**
- a. Ciprofloxacin
 - b. Azithromycin
 - c. Amoxicillin
 - d. Clindamycin
 - e. Doxycycline
- 6. Which complication is NOT typically associated with sinusitis?**
- a. Orbital cellulitis
 - b. Brain abscess
 - c. Meningitis
 - d. Chronic mouth breathing
 - e. Hypertension
- 7. What percentage of people in the developed world are affected by sinusitis each year?**
- a. 1% to 5%
 - b. 5% to 10%
 - c. 10% to 30%
 - d. 30% to 50%
 - e. 50% to 70%
- 8. Which treatment is often reserved for chronic or recurrent sinusitis that does not respond to medical treatment?**
- a. Antibiotics
 - b. Nasal irrigation
 - c. Decongestant nasal sprays
 - d. Functional Endoscopic Sinus Surgery (FESS)
 - e. Antihistamines
- 9. Which symptom is frequently observed in chronic sinusitis cases?**
- a. Loss of smell (anosmia)
 - b. Fever
 - c. Ear drainage
 - d. Sudden vision changes
 - e. Throat swelling
- 10. Which of the following conditions is commonly mismanaged with unnecessary antibiotic treatments?**
- a. Viral sinusitis
 - b. Bacterial sinusitis
 - c. Fungal sinusitis
 - d. Allergic rhinitis
 - e. Chronic obstructive pulmonary disease (COPD)

Tonsillitis

Tonsillitis is an inflammation of the tonsils, which can be acute or chronic. Acute tonsillitis usually has a rapid onset and is characterized by symptoms such as a sore throat, fever, enlarged tonsils, trouble swallowing, and swollen lymph nodes around the neck. Complications can include a peritonsillar abscess, also known as quinsy.



A culture-positive case of streptococcal pharyngitis with typical tonsillar exudate in a 16-year-old.

Causes

Tonsillitis is most commonly caused by viral infections, including adenovirus, rhinovirus, coronavirus, influenza virus, and Epstein-Barr virus, among others. Bacterial infections, particularly by Group A β -hemolytic streptococci (GABHS), can also cause tonsillitis, leading to strep throat. Less common bacterial causes include *Streptococcus pneumoniae*, *Mycoplasma pneumoniae*, and *Neisseria gonorrhoeae*. The infection is typically spread through the air from person to person.



Bacteria or viruses can cause tonsillitis.

Signs and Symptoms

Individuals with tonsillitis generally experience a sore throat, painful swallowing, malaise, and fever. The tonsils and sometimes the back of the throat appear red and swollen, with possible white discharge. Swelling of the cervical lymph nodes is also common. Viral infections may

also cause cough, runny nose, hoarseness, or blistering in the mouth or throat, while infectious mononucleosis can cause tonsillar swelling with red spots or white discharge, along with other systemic symptoms.

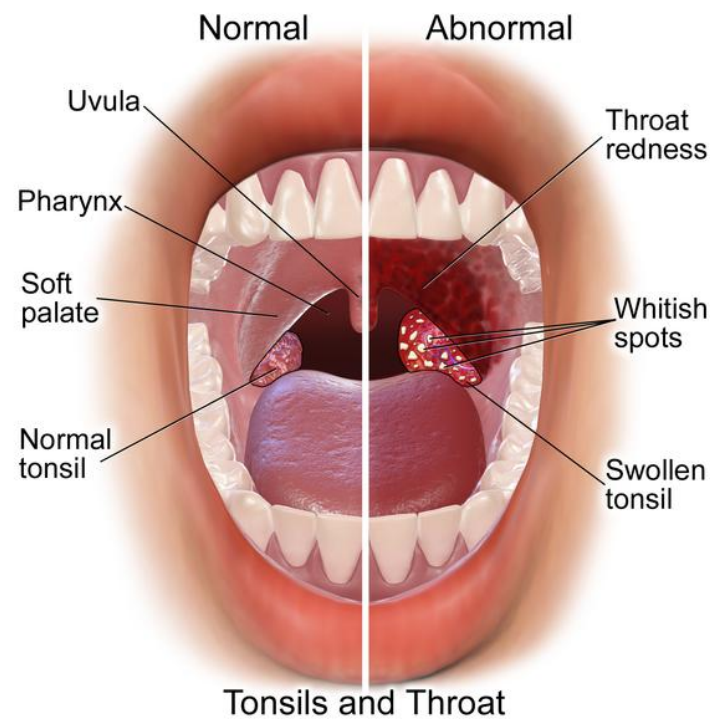
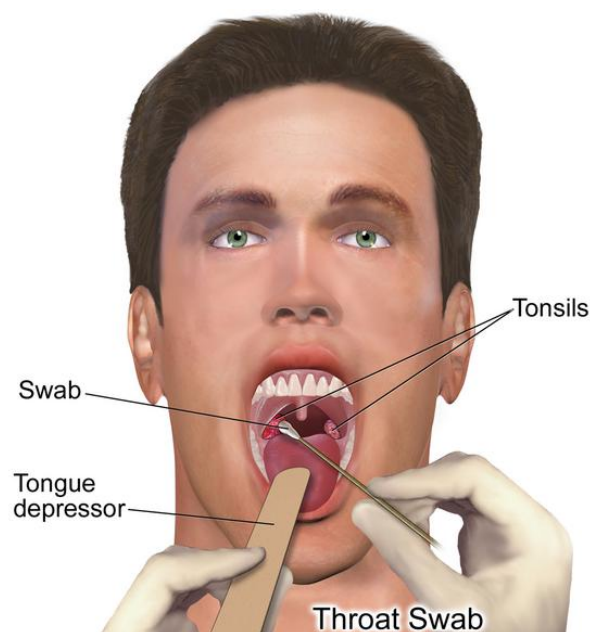


Illustration comparing normal tonsil anatomy and tonsillitis.

Diagnosis

Diagnosis may involve clinical assessment and laboratory tests. The Centor criteria are used to evaluate the likelihood of GABHS infection based on the presence of tonsillar exudate, painful neck lymph nodes, history of fever, age between five and fifteen years, and absence of cough. Confirmation can be achieved through throat swabs and rapid strep tests.



Throat swab.

Treatment

Pain and Symptom Management

Treatment often involves managing pain and symptoms using paracetamol (acetaminophen), ibuprofen, warm salt water gargles, lozenges, honey, or warm liquids. There are no specific antiviral treatments for virally caused tonsillitis.

Antibiotics

For bacterial tonsillitis caused by GABHS, antibiotics such as penicillin or amoxicillin are usually prescribed. Cephalosporins and macrolides can be used as alternatives for those allergic to penicillin. Antibiotic treatment typically lasts seven to ten days.

Pain Medication

Pain relief can be achieved using paracetamol and nonsteroidal anti-inflammatory drugs (NSAIDs). Opioids like codeine are generally avoided in children under 12 years. Anaesthetic mouthwash can provide symptomatic relief.

Corticosteroids

Corticosteroids are effective in reducing pain and improving symptoms within 24 to 48 hours. Oral corticosteroids are recommended unless the patient is unable to swallow medications.

Surgery

In cases of recurrent tonsillitis or significant obstruction, a tonsillectomy may be performed to remove the tonsils. This procedure has been found to be more effective and cost-efficient compared to medical treatment alone, especially in adults with frequent episodes.

Prognosis and Complications

Since the introduction of penicillin, the focus has been on preventing complications such as rheumatic fever, which can affect the nervous system and heart. Other complications include dehydration, kidney failure, blocked airways, and peritonsillar abscesses. Rarely, the infection can spread to the internal jugular vein, causing Lemierre's syndrome, or lead to post-streptococcal glomerulonephritis.

Epidemiology

Tonsillitis is common worldwide, particularly in school-aged children, and typically occurs during colder months. Most children experience tonsillitis at least once, with bacterial infections more common at a later age.

Historical and Cultural Context

Tonsillitis has been documented since ancient times, including in the Greek Hippocratic Corpus. Recurrent tonsillitis can notably affect individuals who rely on their vocal abilities professionally.

Self-assessment MCQs (select the best answer)

1. Which of the following is NOT a common symptom of acute tonsillitis?
 - a. Sore throat
 - b. Fever
 - c. Enlarged tonsils

- d. Diarrhoea
 - e. Trouble swallowing
- 2. What is the most common bacterial cause of tonsillitis?**
- a. *Streptococcus pneumoniae*
 - b. *Mycoplasma pneumoniae*
 - c. Group A β -hemolytic streptococci (GABHS)
 - d. *Neisseria gonorrhoeae*
 - e. Epstein-Barr virus
- 3. Which diagnostic criteria are used to evaluate the likelihood of GABHS infection in tonsillitis?**
- a. Apgar score
 - b. Centor criteria
 - c. Glasgow Coma Scale
 - d. Bishop score
 - e. SOFA score
- 4. Which of the following is a complication of untreated bacterial tonsillitis?**
- a. Rheumatic fever
 - b. Diabetes
 - c. Hypertension
 - d. Asthma
 - e. Epilepsy
- 5. What is typically used to confirm a diagnosis of streptococcal pharyngitis?**
- a. Blood test
 - b. Urine test
 - c. Throat swab
 - d. Chest X-ray
 - e. MRI scan
- 6. For pain relief in tonsillitis, which of the following is generally NOT recommended for children under 12 years?**
- a. Paracetamol
 - b. Ibuprofen
 - c. Codeine
 - d. Warm salt water gargles
 - e. Lozenges
- 7. Which of the following is NOT a common viral cause of tonsillitis?**
- a. Adenovirus
 - b. Rhinovirus
 - c. Influenza virus
 - d. Epstein-Barr virus
 - e. *Streptococcus pneumoniae*
- 8. When is a tonsillectomy typically considered for a patient with tonsillitis?**
- a. At the first sign of infection
 - b. After one episode of tonsillitis
 - c. In cases of recurrent tonsillitis or significant obstruction
 - d. Only if the patient is over 50 years old
 - e. If the patient has a cough

9. Which age group is most commonly affected by tonsillitis?

- a. Infants under 1 year
- b. School-aged children
- c. Adults over 50
- d. Newborns
- e. Middle-aged adults

10. Which medication is commonly prescribed for bacterial tonsillitis caused by GABHS?

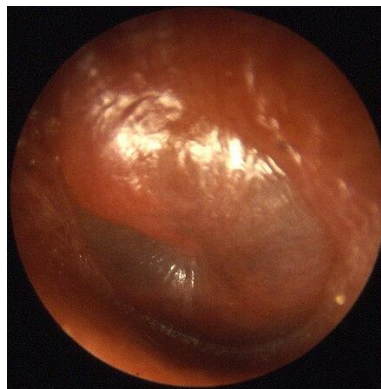
- a. Amoxicillin
- b. Insulin
- c. Metformin
- d. Atenolol
- e. Omeprazole

Otitis Media

Otitis media is a group of inflammatory diseases of the middle ear, which is a common condition in childhood. It primarily presents in three forms: acute otitis media (AOM), otitis media with effusion (OME), and chronic suppurative otitis media (CSOM).

Signs and Symptoms

The primary symptom of **acute otitis media (AOM)** is ear pain. Other possible symptoms include fever, reduced hearing, tenderness above the ear, purulent discharge, irritability, ear blockage, and diarrhoea in infants. Often, AOM follows an upper respiratory tract infection (URTI), leading to accompanying symptoms like cough and nasal discharge.



A bulging tympanic membrane which is typical in a case of acute otitis media

Otitis media with effusion (OME), also known as serous or secretory otitis media, typically does not present with symptoms, though a feeling of fullness in the ear may be described. **Chronic suppurative otitis media (CSOM)** is characterized by a perforated tympanic membrane with discharge for more than six weeks, often following an episode of AOM. Pain is rarely present, but hearing loss is common across all three types of otitis media.

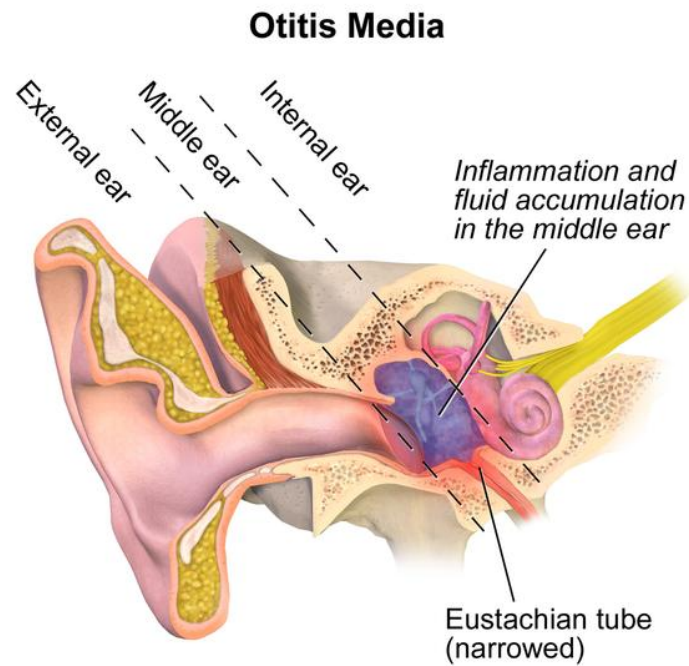


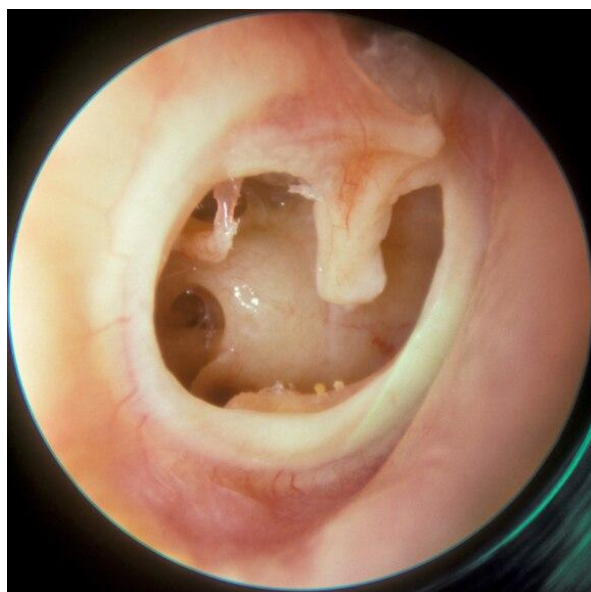
Diagram of otitis media showing the middle ear inflammation and fluid accumulation

Causes

The common cause of all forms of otitis media is dysfunction of the Eustachian tube. This dysfunction is usually due to inflammation of the mucous membranes in the nasopharynx, often caused by a viral URTI, strep throat, or possibly allergies. This can lead to fluid accumulation in the middle ear, which may become infected by bacteria or viruses.

Diagnosis

Diagnosis of otitis media requires visualization of the tympanic membrane. Examiners may use a pneumatic otoscope to assess the mobility of the tympanic membrane. Tympanometry, reflectometry, and hearing tests can also aid in diagnosis.



Perforation of the right tympanic membrane resulting from previous severe acute otitis media

In severe cases, audiometry, tympanogram, temporal bone CT, and MRI can assess for complications like mastoid effusion, abscess formation, or meningitis. For accurate diagnosis, middle-ear effusion and inflammation of the eardrum must be identified.

Treatment

Pain management is very important in treating AOM, using oral agents like ibuprofen, paracetamol, or opiates, and effective topical agents like antipyrine and benzocaine ear drops. Decongestants and antihistamines are not recommended due to lack of benefit and potential side effects. Half of the cases resolve without treatment in three days, and 90% resolve in a week.

Antibiotics

Antibiotics can be beneficial but are not always necessary, as many episodes resolve without them. Narrow-spectrum antibiotics like amoxicillin are recommended initially. For recurrent infections, tympanostomy tubes may help reduce recurrence. For otitis media with effusion, antibiotics may increase symptom resolution but also increase risks of diarrhoea, vomiting, and rash.

Tympanostomy Tubes

Tympanostomy tubes are recommended for children with recurrent AOM, with evidence suggesting modest improvement in reducing episodes. However, they do not affect long-term hearing or language development.

Chronic Suppurative Otitis Media

Topical antibiotics may be useful for CSOM, especially quinolones, which are probably better at resolving ear discharge compared to antiseptics. Oral antibiotics are not recommended for uncomplicated tympanostomy tube otorrhea.

Outcomes

Complications of AOM include perforation of the tympanic membrane, mastoiditis, and rarely, intracranial complications like bacterial meningitis. Persistent middle ear fluid can lead to conductive hearing loss and impact speech development in children. Global prevalence of mild hearing loss due to otitis media is approximately 2.1%.

Self-assessment MCQs (select the best answer)

1. **What is the primary symptom of acute otitis media (AOM)?**
 - a. Hearing loss
 - b. Ear pain
 - c. Diarrhoea
 - d. Ear discharge
 - e. Fullness in the ear

2. **Which of the following is NOT typically associated with otitis media with effusion (OME)?**
 - a. Fullness in the ear
 - b. Ear pain
 - c. Reduced hearing
 - d. Feeling of ear blockage
 - e. Absence of symptoms

- 3. What characterizes chronic suppurative otitis media (CSOM)?**
 - a. Acute ear pain
 - b. Fluid accumulation without symptoms
 - c. Perforated tympanic membrane with discharge for more than six weeks
 - d. Fullness in the ear
 - e. Temporary hearing loss
- 4. What is the common cause of all forms of otitis media?**
 - a. Allergies
 - b. Eustachian tube dysfunction
 - c. Bacterial infection
 - d. Viral infection
 - e. Earwax buildup
- 5. Which diagnostic tool is commonly used to assess the mobility of the tympanic membrane?**
 - a. Audiometry
 - b. Tympanometry
 - c. Pneumatic otoscope
 - d. Reflectometry
 - e. MRI
- 6. What is the initial recommended antibiotic for treating AOM?**
 - a. Ciprofloxacin
 - b. Amoxicillin
 - c. Azithromycin
 - d. Erythromycin
 - e. Tetracycline
- 7. Which treatment is NOT recommended for otitis media due to lack of benefit and potential side effects?**
 - a. Ibuprofen
 - b. Paracetamol
 - c. Opiates
 - d. Decongestants
 - e. Benzocaine ear drops
- 8. For children with recurrent AOM, what intervention is suggested to reduce recurrence?**
 - a. Oral antibiotics
 - b. Steroids
 - c. Tympanostomy tubes
 - d. Decongestants
 - e. Antihistamines
- 9. Which antibiotic is recommended for topical use in treating CSOM?**
 - a. Amoxicillin
 - b. Erythromycin
 - c. Quinolones
 - d. Tetracycline
 - e. Azithromycin
- 10. What is a possible complication of AOM that can affect speech development in children?**
 - a. Chronic ear pain
 - b. Conductive hearing loss
 - c. Intracranial infections
 - d. Perforated tympanic membrane
 - e. Mastoiditis

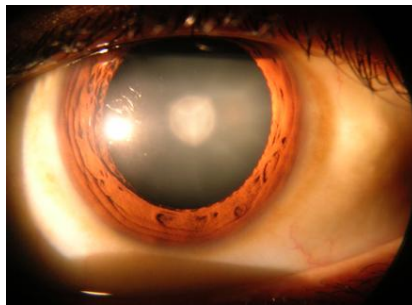
WEEK 10: Nursing Management of Patients with Ophthalmic Disorders.

- Assessment and diagnostic test
- Cataract
- Glaucoma.

Cataract

Cataracts are a common eye condition characterized by clouding of the lens, leading to a decrease in vision. They develop slowly and can affect one or both eyes. Symptoms include faded colours, blurry or double vision, halos around light, trouble with bright lights, and difficulty seeing at night.

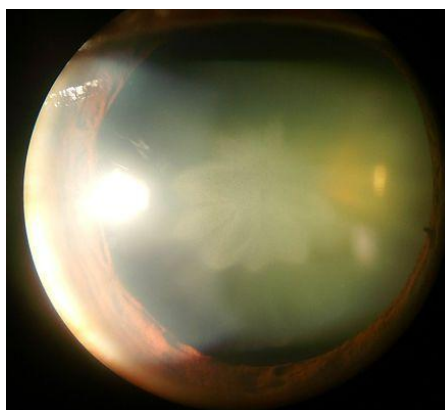
This condition can hinder daily activities such as driving, reading, and recognizing faces, and it significantly increases the risk of falls and depression. Cataracts account for 51% of all cases of blindness and 33% of visual impairment worldwide.



Magnified view of a cataract seen on examination with a slit lamp

Causes and Risk Factors

Cataracts are primarily caused by ageing, but other factors include trauma, radiation exposure, genetic predisposition, and post-eye surgery changes. Risk factors include diabetes, prolonged use of corticosteroids, smoking, prolonged exposure to sunlight, and alcohol consumption. The underlying mechanism involves the accumulation of protein clumps or yellow-brown pigment in the lens, reducing light transmission to the retina.



Post traumatic rosette cataract of a 60-year-old male

Signs and Symptoms

Symptoms of cataracts vary based on the type but often include visual impairment. Nuclear cataracts affect distance vision more than near vision, while posterior subcapsular cataracts primarily cause glare. Other signs include frequent changes in glasses prescription and coloured halos due to lens hydration. Congenital cataracts, if untreated, can lead to amblyopia.

An example of normal vision versus vision with cataracts.



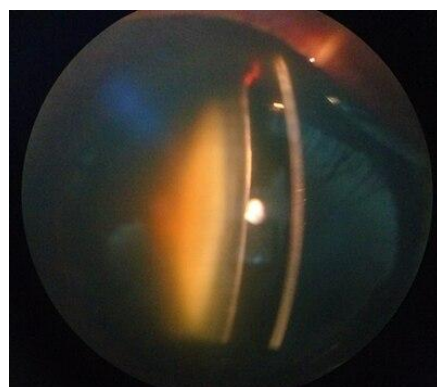
Bilateral cataracts in an infant due to congenital rubella syndrome

Diagnosis

Diagnosis primarily involves a visual acuity test and a comprehensive eye examination. Cataracts can be classified histologically into nuclear sclerosis, cortical, and posterior subcapsular types. These types can be further classified based on severity using the Lens Opacities Classification System (LOCS III).



Posterior polar cataract of an 8-year-old boy in left eye



Nuclear sclerosis cataract of a 70-year-old male

Prevention

Although no definitive prevention methods exist, certain lifestyle changes may reduce the risk or slow the progression. Wearing sunglasses that block ultraviolet light, maintaining a proper diet rich in vitamins A, C, and E, and avoiding smoking are recommended. The evidence for vitamin supplements is mixed but suggests some potential benefits.

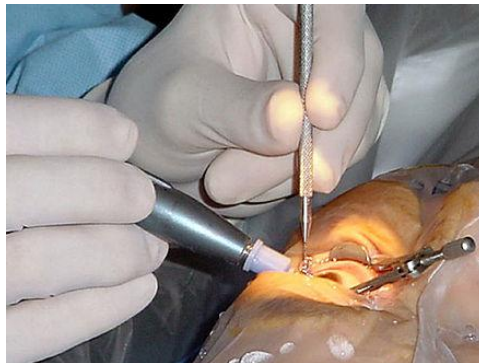
Treatment

Non-Surgical

In the early stages, visual symptoms may be managed with glasses. However, this is often insufficient in advanced cases.

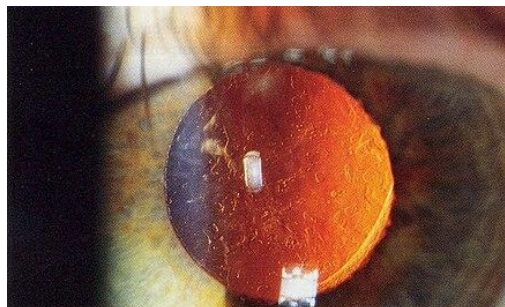
Surgical

Surgery is the only effective treatment when cataracts significantly impair vision. The most common procedure is phacoemulsification, where an ultrasonic probe breaks up the lens, which is then removed and replaced with an artificial intraocular lens. This surgery is typically performed on an outpatient basis under local anesthesia with a high success rate, restoring vision to 20/40 or better in most cases.



Cataract surgery using a temporal-approach phacoemulsification probe and "chopper" under an operating microscope.

Postoperative care involves avoiding strenuous activities and using protective measures like an eye shield. Complications are rare but can include retinal detachment and endophthalmitis. Posterior capsular opacification is a common condition managed with Nd:YAG laser capsulotomy.



Posterior capsular opacification visible a few months after implantation of intraocular lens, seen on retroillumination

Epidemiology

Cataracts are a leading cause of blindness globally, affecting over 20 million people. In the United States, cataracts are prevalent in 68% of those over 80 years old, with significant medical costs associated with treatment.

Research

Emerging treatments include N-Acetylcarnosine eye drops and femtosecond laser-assisted cataract surgery, which offer promising alternatives to traditional methods. Stem cell research is also looking at lens regeneration, particularly in children with congenital cataracts.

Self-assessment MCQs (Select the best answer)

- 1. What is the primary cause of cataracts?**
 - a. Trauma
 - b. Radiation exposure
 - c. Ageing
 - d. Genetic predisposition
 - e. Post-eye surgery changes

- 2. Which of the following is NOT a symptom of cataracts?**
 - a. Faded colours
 - b. Blurry or double vision
 - c. Halos around light
 - d. Improved night vision
 - e. Trouble with bright lights

- 3. Which type of cataract primarily causes glare?**
 - a. Nuclear cataract
 - b. Cortical cataract
 - c. Posterior subcapsular cataract
 - d. Congenital cataract
 - e. Traumatic cataract

- 4. Which lifestyle change is NOT recommended to reduce the risk of cataracts?**
 - a. Wearing sunglasses that block ultraviolet light
 - b. Maintaining a diet rich in vitamins A, C, and E
 - c. Avoiding smoking
 - d. Consuming alcohol regularly
 - e. Regular eye check-ups

- 5. What is the most common surgical procedure to treat cataracts?**
 - a. LASIK
 - b. PRK
 - c. Phacoemulsification
 - d. Keratoplasty
 - e. Vitrectomy

- 6. What percentage of blindness cases worldwide are due to cataracts?**
 - a. 25%
 - b. 33%
 - c. 51%
 - d. 60%
 - e. 75%

- 7. What is a common complication that may occur a few months after cataract surgery?**
 - a. Retinal detachment
 - b. Posterior capsular opacification
 - c. Endophthalmitis
 - d. Glaucoma
 - e. Macular degeneration

- 8. In which age group in the United States are cataracts prevalent in 68% of individuals?**
- a. Over 50 years old
 - b. Over 60 years old
 - c. Over 70 years old
 - d. Over 80 years old
 - e. Over 90 years old
- 9. Which of the following is a promising emerging treatment for cataracts?**
- a. N-Acetylcarnosine eye drops
 - b. Topical antibiotics
 - c. Intravitreal injections
 - d. Refractive surgery
 - e. Corneal transplants
- 10. What does the Lens Opacities Classification System (LOCS III) classify?**
- a. Types of retinal diseases
 - b. Severity of cataracts
 - c. Types of glaucoma
 - d. Stages of macular degeneration
 - e. Levels of intraocular pressure

Glaucoma

Glaucoma is a group of eye diseases causing optic nerve damage, potentially leading to vision loss. It is primarily associated with increased intraocular pressure (IOP) but can also occur with normal IOP. The condition progresses silently, often leading to irreversible vision loss if untreated.

Signs and Symptoms

Open-angle glaucoma typically presents without early symptoms, gradually causing peripheral vision loss, which can eventually affect central vision. Acute angle-closure glaucoma, a medical emergency, is characterized by sudden ocular pain, seeing halos around lights, red eye, very high IOP, nausea, and vomiting. Opaque specks in the lens, known as glaukomflecken, may also occur.



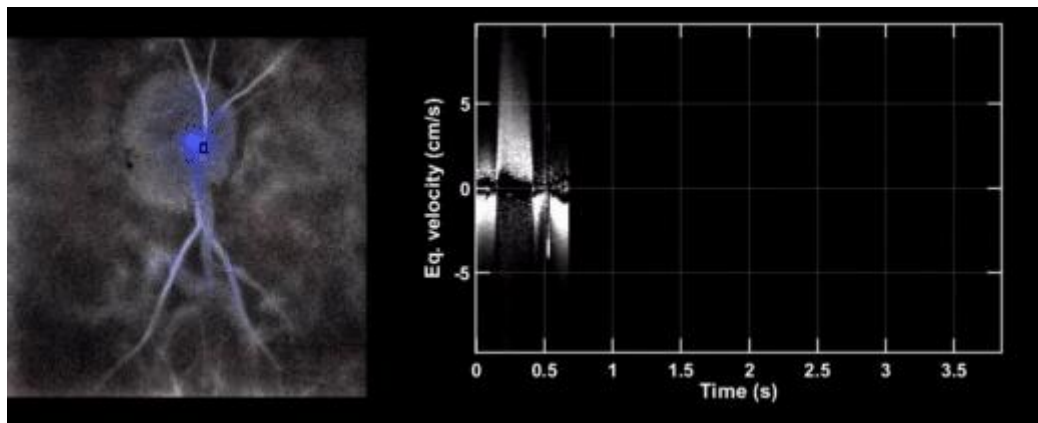
Acute angle closure glaucoma



Advanced vision loss from glaucoma

Risk Factors

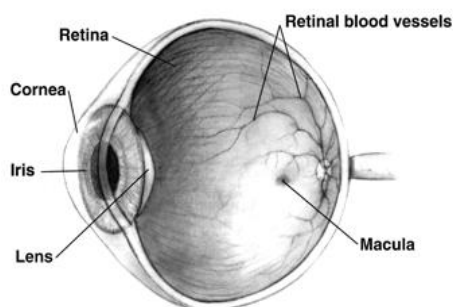
Increased IOP is a significant risk factor, but other factors include age, family history, high blood pressure, and use of steroids. Genetic predispositions, ethnicity, particularly among African Americans, Latinos, and Asian-Americans, and specific medical conditions like diabetes and severe retinal vein occlusion can also increase risk.



Laser Doppler imaging reveals arterial blood flow reversal in neovascular glaucoma.

Pathophysiology

Glaucoma primarily damages the optic nerve due to elevated IOP. In open-angle glaucoma, obstructed aqueous humour flow through the trabecular meshwork causes pressure build-up. In angle-closure glaucoma, the iris obstructs the drainage angle, leading to a rapid pressure increase. The exact mechanisms are not fully understood, but theories include mechanical damage from increased IOP and vascular issues reducing blood supply to the optic nerve.



Human eye cross-sectional view.

Diagnosis

Glaucoma diagnosis involves comprehensive eye examinations, including IOP measurement, anterior chamber angle assessment, gonioscopy, retinal nerve fiber layer assessment via dilated fundus examination, corneal thickness measurement, and visual field testing.



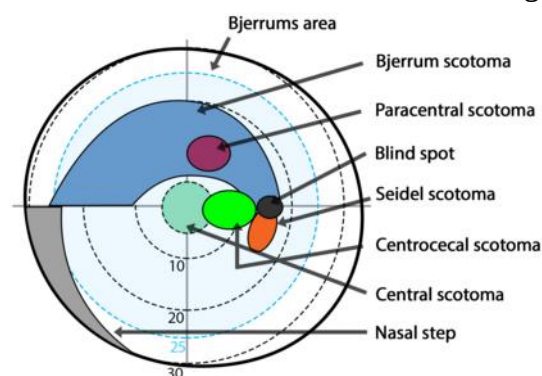
Optic nerve in advanced glaucoma disease.

Types

Glaucoma is broadly categorized into primary and secondary types. Primary includes open-angle and angle-closure glaucoma. Secondary glaucoma results from conditions like uveitis, trauma, or steroid use. Developmental glaucoma affects neonates or juveniles due to congenital abnormalities.

Visual Field Defects

Visual field defects in glaucoma are due to retinal nerve fiber layer damage, often manifesting in Bjerrum's area. Early defects include generalized depression and paracentral scotomas, progressing to arcuate scotomas and tubular vision in advanced stages.



Bjerrum's area and types of scotomas on the visual field.

Treatment

Medication

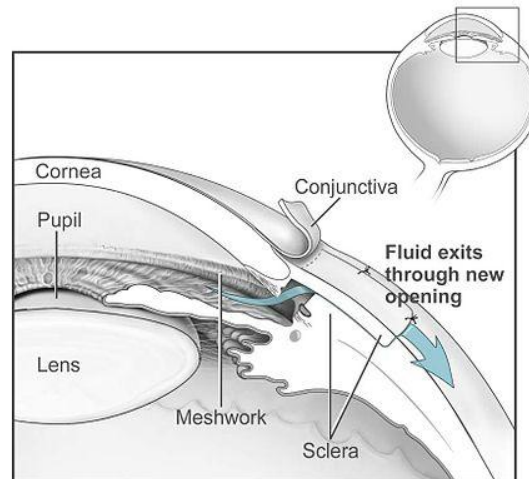
The primary goal is to lower IOP to slow disease progression. First-line treatments include prostaglandin analogues like latanoprost, which increase aqueous fluid outflow. Other medications include beta-blockers, alpha-adrenergic agonists, miotic agents, and carbonic anhydrase inhibitors.

Laser

Laser treatments like Argon Laser Trabeculoplasty (ALT) and Nd:YAG laser peripheral iridotomy (LPI) are used to enhance aqueous humour drainage or relieve angle closure.

Surgery

Surgical options include trabeculectomy, creating new drainage openings, and glaucoma drainage implants. Canaloplasty uses microcatheters to enhance drainage channels. Nonpenetrating deep sclerectomy (NPDS) and laser-assisted NPDS offer less invasive alternatives, reducing side effects.



Conventional surgery to treat glaucoma makes a new opening in the trabecular meshwork, which helps fluid to leave the eye and lowers intraocular pressure.

Epidemiology

Globally, glaucoma affects over 44.7 million people and is the second leading cause of blindness. It is more prevalent in older adults and certain ethnic groups, notably African Americans and Asians.

History

Glaucoma's association with elevated IOP was first noted in 1622. Significant advancements include the invention of the ophthalmoscope in 1851, enabling optic nerve head examination, and the development of the first tonometer in 1905.

Research

Recent studies compare the effectiveness of eye drops versus surgical treatments like trabeculectomy for glaucoma. Neuroprotective agents and anti-VEGF treatments are also being looked at to improve outcomes.

Self-assessment MCQs (Select the best answer)

1. Which of the following is a characteristic symptom of acute angle-closure glaucoma?
 - a. Gradual peripheral vision loss
 - b. Sudden ocular pain
 - c. Blurred vision in the morning
 - d. Night blindness
 - e. Double vision

2. What is the primary goal of glaucoma treatment?

- a. To cure the disease
- b. To lower intraocular pressure (IOP)
- c. To improve night vision
- d. To reduce eye redness
- e. To enhance colour perception

3. Which of the following treatments is NOT typically used for glaucoma?

- a. Prostaglandin analogues
- b. Beta-blockers
- c. Antihistamines
- d. Alpha-adrenergic agonists
- e. Carbonic anhydrase inhibitors

4. What is a common visual field defect in early-stage glaucoma?

- a. Bjerrum scotoma
- b. Tubular vision
- c. Central vision loss
- d. Paracentral scotoma
- e. Hemianopia

5. Which diagnostic tool is used to assess the optic nerve head in glaucoma patients?

- a. Gonioscopy
- b. Retinoscopy
- c. Ophthalmoscope
- d. Slit-lamp examination
- e. Visual acuity test

6. Which ethnic group is at higher risk for developing glaucoma?

- a. Caucasians
- b. African Americans
- c. Native Americans
- d. Pacific Islanders
- e. Europeans

7. Which type of glaucoma is associated with a rapid increase in intraocular pressure due to iris obstruction?

- a. Open-angle glaucoma
- b. Neovascular glaucoma
- c. Angle-closure glaucoma
- d. Normal-tension glaucoma
- e. Secondary glaucoma

8. What is the purpose of Argon Laser Trabeculoplasty (ALT) in glaucoma treatment?

- a. To increase aqueous fluid outflow
- b. To decrease aqueous fluid production
- c. To reshape the cornea
- d. To remove cataracts
- e. To repair retinal detachment

9. Which medication class is considered first-line treatment for lowering IOP in glaucoma patients?

- a. Alpha-adrenergic agonists
- b. Beta-blockers
- c. Prostaglandin analogues
- d. Miotic agents
- e. Carbonic anhydrase inhibitors

10. What is the term used to describe the opaque specks in the lens associated with acute angle-closure glaucoma?

- a. Cataracts
- b. Floaters
- c. Glaukomflecken
- d. Pinguecula
- e. Pterygium