

## \* SHORT-SIGHTEDNESS

### → Definition :

Short-sightedness is also known as Myopia. It is an eye disorder in which a person is unable to see distant objects clearly.

### → Causes :

#### 1. Eyeball Shape :-

Myopia typically occurs due to elongation of eyeball. An elongated eyeball leads to image formation in front of retina, rather than directly on it. This results in distant objects appearing blurry or out of focus to individuals with myopia.

#### 2. Genetics :

Myopia tends to run in families, suggesting a genetic component. If one or both parents have myopia, there is an increased risk of developing it.

### → Symptoms :

#### 1. Blurred distance vision :-

Individuals with myopia see objects in the distance as blurry or unclear. They may have trouble reading signs, or

## 2. Squinting :-

People with myopia often squint to try to see distant objects more clearly.

## 3. Eye Strain :-

Extended periods of focusing on distant objects can lead to eye strain, discomfort, and fatigue.

## 4. Headaches :-

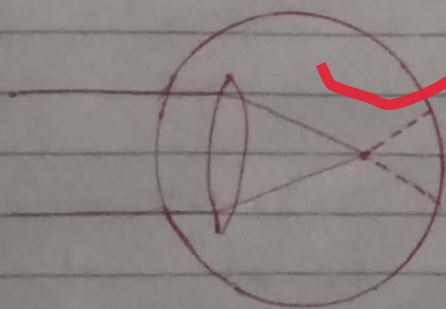
Struggling to see distant objects can result in frequent headaches, particularly after activities that require focusing.

## → Treatment :

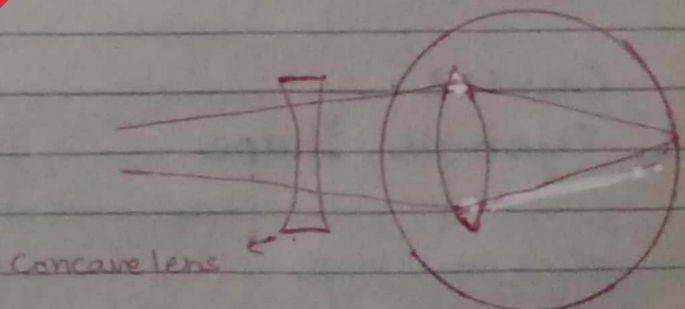
### 1. Glasses and Contact lenses:-

Glasses with concave lenses are used to treat myopia. Concave lenses bend the light in such a way that it is focused onto the retina, allowing clear vision of distant objects.

Similarly, contact lenses are worn directly on the eye and they improve distant vision.



Myopia



Treatment of Myopia

## 2. Orthokeratology:-

It is a non-surgical treatment where special contact lenses are worn overnight to reshape the cornea temporarily. It provides clear vision during the day without the need for the glasses or contact lenses.

## 3. Refractive Surgery:-

Procedures like LASIK (Laser-Assisted In Situ Keratomileusis) and PRK (Photorefractive Keratectomy) are surgical options that permanently reshape the cornea to correct myopia. These are typically considered for individuals with stable vision. and

## \* LONG-SIGHTEDNESS.

### Definition:-

Long sightedness, also known as hyperopia or hypermetropia, is a condition where a person is not able to see clear objects clearly.

### Causes:-

#### 1. Eyeball Shape

Hyperopia happens due to shortening of eyeball. When eyeball gets shortened, image of an object is formed behind

the retina.

## 2. Genetics

A family history of hyperopia can increase the likelihood of developing the condition.

## Syptoms:

### 1. Blurred Vision and difficulty with close-up tasks:-

Near objects appear blurry and people with hyperopia may have trouble reading, sewing or other activities that require close vision.

### 2. Eye Strain and Headache :-

Farsighted individuals may experience eye strain, discomfort or headaches when focusing on nearby objects for extended periods.

### 3. Squinting :-

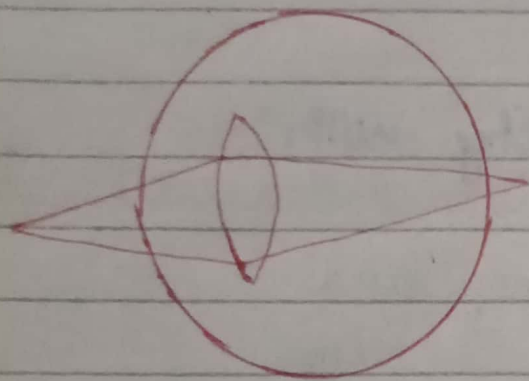
Some individuals may instinctively squint to improve their focus on close-up objects.

## Treatment :

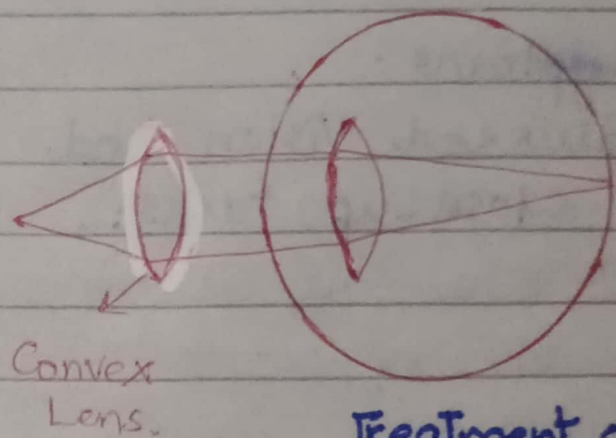
### 1. Eye Glasses and Contact lenses :-

The most common ways to correct hyperopia are through prescription eyeglasses or contact lenses. Eyeglasses use convex lenses to bend light, enabling

clear vision at all distances. While contact lenses sit directly on the eye and correct the refractive error.



Hypermetropia



Treatment of Hypermetropia

## 2. Refractive Surgery :-

In some cases, individuals may opt for refractive surgery, such as LASIK or PRK to reshape the cornea and improve vision without need for glasses or contact lenses. However, surgery is not suitable for everyone.

## \* COLOR BLINDNESS

### Definition :-

Color blindness, also known as Color Vision Deficiency (CVD), is a condition that makes it harder for a person to see color or perceive the difference between colors like red, green or blue. There are some rare cases when person can't see or identify any color at all.

### Causes :-

Color blindness can be attributed to various ~~to~~ causes, including hereditary causes factors and acquired conditions that develop later in life.

#### 1. Hereditary Causes

The most common cause of color blindness is hereditary, resulting from genetic mutations. These mutations typically affect the genes responsible for producing the photoreceptor cells in the retina, known as cones. Cones play a crucial role in color perception. There are 3 types of cones, each of which recognizes one of the 3 primary colors (red, green, blue). The inheritance pattern for color blindness is X-linked recessive, making it more prevalent in males.

## 2. Acquired causes:

### Chemical Exposure

Acquired color blindness can result from exposure to chemicals that harm the nervous system. This includes substances like organic solvents, solvent mixtures and heavy metals.

### Prolonged Welding Exposure

Long-term exposure to intense light emitted during welding can contribute to acquired color blindness.

### Medications

Certain medications such as hydroxychloroquine, prescribed to treat conditions like rheumatoid arthritis, can lead to color vision deficiencies as a side effect.

### Eye Conditions

Various eye conditions, including age-related macular degeneration, glaucoma and cataracts, can affect color perception.

### Neurological and Systemic conditions

Medical conditions that affect the brain or nervous system such as diabetes, Alzheimer's disease and Multiple Sclerosis can influence color vision.

## Symptoms :

1. It's challenging to see colors.
2. It's difficult to distinguish the difference between specific colors.
3. It's hard to tell the brightness of colors i.e individuals with color blindness perceive colors as less vibrant or intense than individuals with normal color vision.

## Treatment :

1. Inherited color blindness has no cure. Some individuals use specialized lenses, available as both contact lenses & eye glasses, to enhance color perception & potentially improve their ability to distinguish between certain colors.
2. For cases associated with underlying medical conditions or medication side effect, color blindness can often be addressed by treating the underlying cause of the problem:



## \* NIGHT BLINDNESS

### Definition :-

Night blindness, medically known as Nyctalopia, refers to a condition where an individual experiences impaired vision in low light or night time conditions. This difficulty in seeing in the dark is accompanied by a reduced ability to transition smoothly from well-lit environment to poorly illuminated ones.

### Causes:

Night blindness arises from various underlying conditions, which are mentioned below;

#### 1. Glaucoma

It encompasses a group of eye disorders characterized by increased pressure within the eye, resulting in optic nerve damage. This damage can lead to vision impairment.

#### 2. Cataracts

They develop when eye's lens becomes clouded. This cloudiness is caused by breakdown of lens protein, primarily associated with aging process. Cataracts can significantly hinder vision, particularly in low light settings.

#### 3. Myopia

Nearsighted individual have difficulty in seeing distant objects clearly.

#### 4. Vitamin A deficiency

Rods contain a pigment called rhodopsin. When light falls on rhodopsin, it breaks for generating nerve impulse. Body synthesizes rhodopsin from vitamin A. Hence, deficiency of vitamin causes poor night vision.

#### 5. Retinitis Pigmentosa

This group of rare genetic eye disorders progressively damages the retina's cell. People with these disorders often experience difficulties seeing in low-light conditions.

##### Symptoms :

1. Impaired ability to see in dimly lit or dark places.
2. Blurred vision in general.
3. Difficulty seeing objects at night.

## Treatment :

The treatment of night blindness depends on its underlying cause.

### 1. Vitamin A supplementation

Supplementation with vitamin A is recommended if night blindness is caused due to deficiency of vitamin A.

### 2. Cataract Surgery

In cases where cataracts are the cause of night blindness, surgical removal of the clouded lens and replacement with an artificial lens can significantly improve vision.

### 3. Managing Underlying Eye Conditions

If night blindness results from conditions like glaucoma or retinitis pigmentosa, managing these conditions through medication, surgery or other treatments may help alleviate night vision problems.

### 4. Corrective lenses

For individuals with myopia, wearing corrective ~~len~~ eyeglasses or contact lenses can improve their overall ~~condition~~ vision, which may help with night vision as well.

Good

Try attempting questions from past papers