

VISUAL FATIGUE

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VISUAL FATIGUE

Primary Disciplinary Field(s): Ophthalmology, Optometry, Neurology, Ergonomics

1. Core Definition

Visual fatigue, medically termed **asthenopia**, is a complex and highly prevalent symptom characterized by non-specific ocular and visual discomfort that arises following the sustained use of the eyes, particularly during intense visual tasks. It represents the physiological limitation of the visual system to maintain optimal performance over time. While the experience is subjective, it often manifests objectively as a reduction in visual acuity, slower accommodation, and difficulties with sustained focus.

The core mechanism involves the excessive strain placed on the extraocular muscles and the ciliary body responsible for focusing, leading to symptoms such as eye ache, dryness, burning sensations, and the specific phenomenon noted in clinical settings: the **dissipating of visual pictures**. This dissipation refers to a temporary reduction in the clarity or stability of images, frequently exacerbated when viewing objects under **vibrant light** conditions. It is a critical functional impairment, distinct from permanent vision loss, yet significantly impacting daily activities and occupational productivity.

2. Etiology and Historical Development

Historically, asthenopia was often attributed solely to uncorrected refractive errors (such as hyperopia or astigmatism) or latent strabismus, which forced the visual system into continuous, strenuous effort to achieve clear vision. However, the rise of modern environments and technologies necessitated a broader understanding of visual fatigue, shifting the focus towards environmental and neurological triggers.

The concept gained significant traction in the late 20th century with the widespread adoption of digital screens. Prolonged interaction with monitors, tablets, and smartphones introduced new physiological stresses, including reduced blink rates, increased glare exposure, and the need for sustained convergence. This led to the classification of a specific syndrome known as Computer Vision Syndrome (CVS) or **digital eye strain**, where visual fatigue serves as the primary and most frequent complaint among affected individuals, especially those who work on a computer regularly.

3. Key Characteristics and Symptom Presentation

Visual fatigue is characterized by a cluster of symptoms, which can be broadly categorized into ocular, visual, and non-visual manifestations. Its defining feature is the direct correlation between symptom onset and the duration or intensity of the visual task being performed. Symptoms typically

resolve or diminish substantially upon resting the eyes.

Ocular Discomfort: Includes physical symptoms such as irritation, soreness, a feeling of grittiness, redness, and dryness. These are often linked to increased evaporative tear loss due to incomplete blinking during focused attention or sustained visual testing.

Visual Degradation: Involves observable declines in visual performance, including temporary blurring of vision (the "dissipating of visual pictures"), difficulty shifting focus between near and far objects (accommodative inertia), and the experience of **diplopia** (double vision) in severe cases.

Light Sensitivity (Photophobia): A prominent characteristic, particularly noted in the source material, where fatigue is aggravated by **vibrant light**. This heightened sensitivity may suggest underlying neurological involvement or inflammatory processes that lower the threshold for discomfort in response to environmental stimuli.

4. Associated Conditions and Triggers

While often triggered by ergonomic factors, visual fatigue is also a significant indicator or complication of underlying medical and neurological conditions. The source content highlights several key associations that move the diagnosis beyond simple eye strain.

One major association is with **optic neuritis**, an inflammatory condition involving the demyelination of the optic nerve. Individuals with optic neuritis frequently experience profound visual fatigue because the compromised nerve transmission requires greater compensatory effort from the visual cortex and related structures to process information, making sustained attention highly taxing. The fatigue experienced in this context is often neurological rather than purely muscular.

Furthermore, visual fatigue is a common sequela following **head traumas**, particularly as a component of post-concussion syndrome. Following traumatic brain injury, the integration of visual, vestibular, and proprioceptive information is often disrupted. The effort required to maintain binocular alignment and visual attention—even during simple tasks such as reading—is dramatically increased, resulting in rapid onset of exhaustion and reduced visual attention. This often leads to avoidance behaviors regarding extended visual tasks.

5. Management and Therapeutic Approaches

Effective management of visual fatigue requires addressing both the underlying physical and environmental causes. Therapeutic approaches are typically tailored to the specific etiology identified during a comprehensive ophthalmic and ergonomic assessment.

For environmentally induced fatigue (e.g., from computer use), interventions focus heavily on ergonomic adjustments, including modifying screen brightness, optimizing viewing distance, ensuring proper posture, and implementing the "20-20-20 rule" (taking a 20-second break every 20

minutes to look at something 20 feet away). Addressing reduced blink rates through the use of artificial tears and ensuring ambient lighting minimizes glare are also crucial steps in mitigating symptoms related to **digital eye strain**.

When visual fatigue is linked to neurological conditions like optic neuritis or post-trauma syndrome, management shifts to include collaboration with neurology specialists. Treatment may involve managing inflammation, visual rehabilitation therapy (to improve binocular coordination and accommodative stamina), and prescribing specialized filter lenses to manage the heightened sensitivity to vibrant light.

Further Reading

[Asthenopia \(Visual Fatigue\) - Wikipedia](#)

[Optic Neuritis - Wikipedia](#)

[American Optometric Association: Computer Vision Syndrome](#)