

# Ocular Toxicity of Tyrosine Kinase Inhibitors

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**Purpose/Objectives:** To review common tyrosine kinase inhibitors, as well as their ocular side effects and management.

**Data Sources:** A comprehensive literature search was conducted using CINAHL®, PubMed, and Cochrane databases for articles published since 2004 with the following search terms: *ocular toxicities, tyrosine kinase inhibitors, ophthalmology, adverse events, eye, and vision*.

**Data Synthesis:** Tyrosine kinase inhibitors can cause significant eye toxicity.

**Conclusions:** Given the prevalence of new tyrosine kinase inhibitor therapies and the complexity of possible pathogenesis of ocular pathology, oncology nurses can appreciate the occurrence of ocular toxicities and the role of nursing in the management of these problems.

**Implications for Nursing:** Knowledge of the risk factors and etiology of ocular toxicity of targeted cancer therapies can guide nursing assessment, enhance patient education, and improve care management. Including a review of eye symptoms and vision issues in nursing assessment can enhance early detection and treatment of ocular toxicity.

Systemic anticancer therapies can cause acute and chronic damage to the eye. Ocular toxicity is generally underestimated and under-reported, and many may consider it to be a minor side effect. However, for the patient, blurred or loss of vision and other ocular symptoms can be troublesome and negatively affect quality of life. Damage to the ocular surfaces, retina, cornea, and optic nerve can be temporary or permanent. Ocular side effects are not uncommon with cytotoxic chemotherapy, but they are rarely severe or dose limiting (Huillard et al., 2014). However, serious toxicity has been associated with molecularly targeted cancer therapies, particularly tyrosine kinase inhibitors (TKIs). This class of drug targets receptors of tyrosine kinase, an enzyme responsible for the activation of proteins involved in the growth, progression, and spread of cancer. This targeted approach is expected to have fewer side effects than more traditional cytotoxic drugs that act nonspecifically on all dividing cells of the body. Ophthalmic side effects of targeted therapies differ depending on the specific molecular targets and the area of the eye involved.

## Eye Anatomy and Function

The eye can be regarded in sections, including the ocular adnexa, anterior segment of the eye, and the posterior segment (see Figure 1). The adnexa of the eye includes the eyelids, eyelashes, lacrimal system, and meibomian glands. The eyelids are folds of muscular tissue that serve to protect the eyeball. The skin on the outer surface of the eyelids is very thin, with little subcutaneous