

## Foscarnet

Foscarnet is an antiviral medication used to treat CMV retinitis in immunocompromised that have failed ganciclovir therapy. It can also be used for acyclovir-resistant HSV. This drug works by inhibiting viral DNA polymerase and does not require activation by a viral kinase. Foscarnet use can lead to nephrotoxicity, and viruses can become resistant when they mutate their DNA polymerase.



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### Indications

#### CMV Retinitis

[Side-toe-mega-virus with Red-tin-eyes](#)

Foscarnet is an antiviral medication used to treat CMV retinitis in immunocompromised patients. Most often, these patients have symptoms which have persisted beyond ganciclovir treatment.

#### Acyclovir-resistant HSV

[Apple-cyclops Resisted By Herpes-harp](#)

Foscarnet is also indicated for use in the treatment of acyclovir-resistant HSV.

### Mechanism

#### Does Not Require Activation (by Viral Kinase)

[Does not require activation-key](#)

This medication does not require phosphorylation or activation by thymidine kinases.

#### Inhibits Viral DNA Polymerase

[Inhibiting-chains on DNA Polly-mirror](#)

This med works by inhibiting viral DNA polymerase by binding to the pyrophosphate-binding site of this enzyme. Thus, foscarnet inhibits elongation of viral DNA.

#### Pyrophosphate Analog

[Pyro-phosphate-P On-a-Log](#)

Foscarnet is a pyrophosphate analog, mimicking its structure. It works by binding to the pyrophosphate-binding site of viral DNA polymerase.

#### Resistance through Mutated DNA Polymerase

[Resistant Mutant DNA Poly-mirror](#)

Viruses can gain resistance to Foscarnet when they mutate their DNA polymerase enzyme. By mutating the enzyme, Foscarnet is no longer able to bind to it and inhibit its effects.

## Side Effects

### **Nephrotoxicity**

#### [Kidney with Toxic-green-glow](#)

This drug is known to cause nephrotoxicity, and leads to increased creatinine levels in patients. This side effect, however, is reversible with adequate hydration and decreased dosage.

### **Electrolyte Abnormalities**

#### [Electric-lights Abnormal](#)

Foscarnet can lead to electrolyte abnormalities, such as hypokalemia, hypocalcemia, and hypomagnesemia. These abnormalities can lead to mental status changes, paresthesias, irritability, hallucinations, or even seizures.

### **Hypokalemia**

#### [Hippo-banana](#)

Hypokalemia is a potassium level less than 3.5 mEq/L. It is characterized by muscle weakness, arrhythmias, presence of U waves, constipation, and hyporeflexia.

### **Hypocalcemia**

#### [Hippo-calcified-cow](#)

Foscarnet can cause hypocalcemia, and less frequently hypercalcemia. Decreased levels of calcium below 8.5 mg/dL are termed hypocalcemia. It is characterized with decreased bone density, muscle spasms, tetany, increased deep tendon reflexes, and a prolonged QT interval.

### **Hypomagnesemia**

#### [Hippo-magnesium-magazine](#)

Hypomagnesemia is characterized by a serum magnesium level of less than 1.5 mEq/L. It is characterized by increased deep tendon reflexes, seizures, muscle cramps, tremors, insomnia, and tachycardia.