

## Antithrombin Deficiency



PLAY PICMONIC

### Characteristics

#### Autosomal Dominant

##### [Domino](#)

Antithrombin III Deficiency is inherited in an autosomal dominant fashion. It can also be acquired secondary to DIC, liver disease, or nephrotic syndrome.

#### Increased Thrombin and Factor X

##### [Up-arrow Trombone and Factory \(10\) tin.](#)

Antithrombin III is a plasma protease inhibitor that has a role in inactivating thrombin. The lack of antithrombin in antithrombin III deficiency causes a decrease in thrombin inhibition. This will result in increased thrombin and factor X.

#### Heparin Resistance

##### [Hippie-heron Resistance-band](#)

The action of heparin requires antithrombin to work properly. In antithrombin III deficiency, heparin can not work well if it's administered alone. This is known as heparin resistance.

#### Hypercoagulability

##### [Hiker-clogs](#)

The decreased inhibition of thrombin in antithrombin III deficiency will cause a hypercoagulable state. Patients can present with thromboses at a young age such as deep vein thrombosis and pulmonary embolism. Venous blood vessels are affected more than arterial blood vessels.

### Diagnosis

#### Family History

##### [Family Portrait](#)

On average, 50% of children of parents heterozygous for antithrombin III deficiency (one affected) can inherit this disease. Therefore, information about family history is essential in these patients.

## Normal PT, PTT, and Bleeding Time

[Normal-sign Blood Clock and Normal PT and PTT](#)

Antithrombin III deficiency does not interfere with the production of platelets nor with intrinsic or extrinsic coagulation factors. This will result in a normal bleeding time, aPTT, and PT, respectively.

## Antithrombin-Heparin Cofactor Assay

[Ant-tie-trombone and Hippie Heron](#)

Antithrombin-heparin cofactor assay is a measurement of the ability of antithrombin to bind heparin and neutralize thrombin or factor Xa. Depending upon the enzyme used, the test can be either a thrombin inhibition assay or a factor Xa inhibition assay (most preferred test). Diagnosis is based on the plasma level of antithrombin.

## Management

### Factor Xa Inhibitors

[\(10\) Tin with A-apple in Inhibiting-chains](#)

Factor Xa inhibitors are used as an alternative to heparin in treating thromboses in antithrombin deficiency. Instead of giving a higher dose of heparin, factor Xa inhibitors act independently of antithrombin levels.

### Direct Thrombin Inhibitors

[Direct Trombone in Inhibiting-chains](#)

Heparin may not be effective in treating antithrombin III deficiency due to its dependency on antithrombin activity. To overcome this issue, a direct thrombin inhibitor is used for anticoagulation.

### Low Molecular Weight Heparin

[Down Arrow Molecule Weight Hippie Heron](#)

Low Molecular Weight Heparin is recommended in pregnant patients with antithrombin deficiency. A larger dose is needed due to heparin resistance in this disorder.

### Antithrombin Replacement

[Ant-tie-trombone](#)

Replacement of antithrombin III is indicated in patients with severe thrombosis, recurrent thromboses, or difficulty achieving sufficient anticoagulation.