WHAT CAUSES HEMOPHILIA? The condition is caused by a problem in one of the genes (factor VIII or factor IX) that tells the body to make the clotting factor proteins needed to form a blood clot. These genes are located on the X chromosome. Males have one X and one Y chromosome (XY), and females have two X chromosomes (XX). As a genetic disorder, hemophilia can be passed on to a child. The scenarios below illustrate how this happens.

**Scenario 1**
The mother is a carrier of the hemophilia gene, and the father does not have hemophilia.

- **Parents**: XY + XX
- **Sons**: 50% chance each son will have hemophilia
- **Daughters**: 50% chance each daughter will be a carrier of the hemophilia gene

**Scenario 2**
The father has hemophilia, and the mother does not carry the hemophilia gene.

- **Parents**: XY + XX
- **Sons**: 0% chance sons will have hemophilia
- **Daughters**: 100% chance daughters will carry the hemophilia gene

**Scenario 3**
The father has hemophilia, and the mother is a carrier of the hemophilia gene.

- **Parents**: XY + XX
- **Sons**: 50% chance each son will have hemophilia
- **Daughters**: 100% chance each daughter will be a carrier of the hemophilia gene

Proportion of people diagnosed with hemophilia who have no family history of the bleeding disorder. In these cases, it’s thought the cause is a change (called a mutation) in the gene’s instructions for making clotting factor protein. This change can prevent the clotting protein from working properly, or the protein may be missing altogether.