



Department of Medical Laboratories Techniques
Human genetic
Lab.11: Family Pedigree
M.Sc. Aamal Muhsen & M.Sc. Mazin E. Hadi



A family pedigree is a visual chart that depicts a family history or the transmission of a specific trait. They can be interesting to view and can be important tools in determining patterns of inheritance of specific traits. Pedigrees are used primarily by genetic counselors when helping couples decide to have children when there is evidence of a genetically inherited disorder in one or both families. They are also used when trying to determine the predisposition of someone to carry a hereditary disease for example, familial breast cancer.

Analyzing Simple Pedigrees:

A pedigree is just like a family tree except that it focuses on a specific genetic trait. A pedigree usually only shows the phenotype of each family member. With a little thought, and the hints below, you may be able to determine the genotype of each family member as well!

Hints for analyzing pedigrees:

- 1) If the individual is homozygous recessive, then both parents **MUST** have at least one recessive allele (parents are heterozygous or homozygous recessive).
- 2) If an individual shows the dominant trait, then at least one of the parents **MUST** have the dominant phenotype. This one will be pretty obvious when you look at the pedigree.
- 3) If both parents are homozygous recessive, then **ALL** offspring will be homozygous recessive.

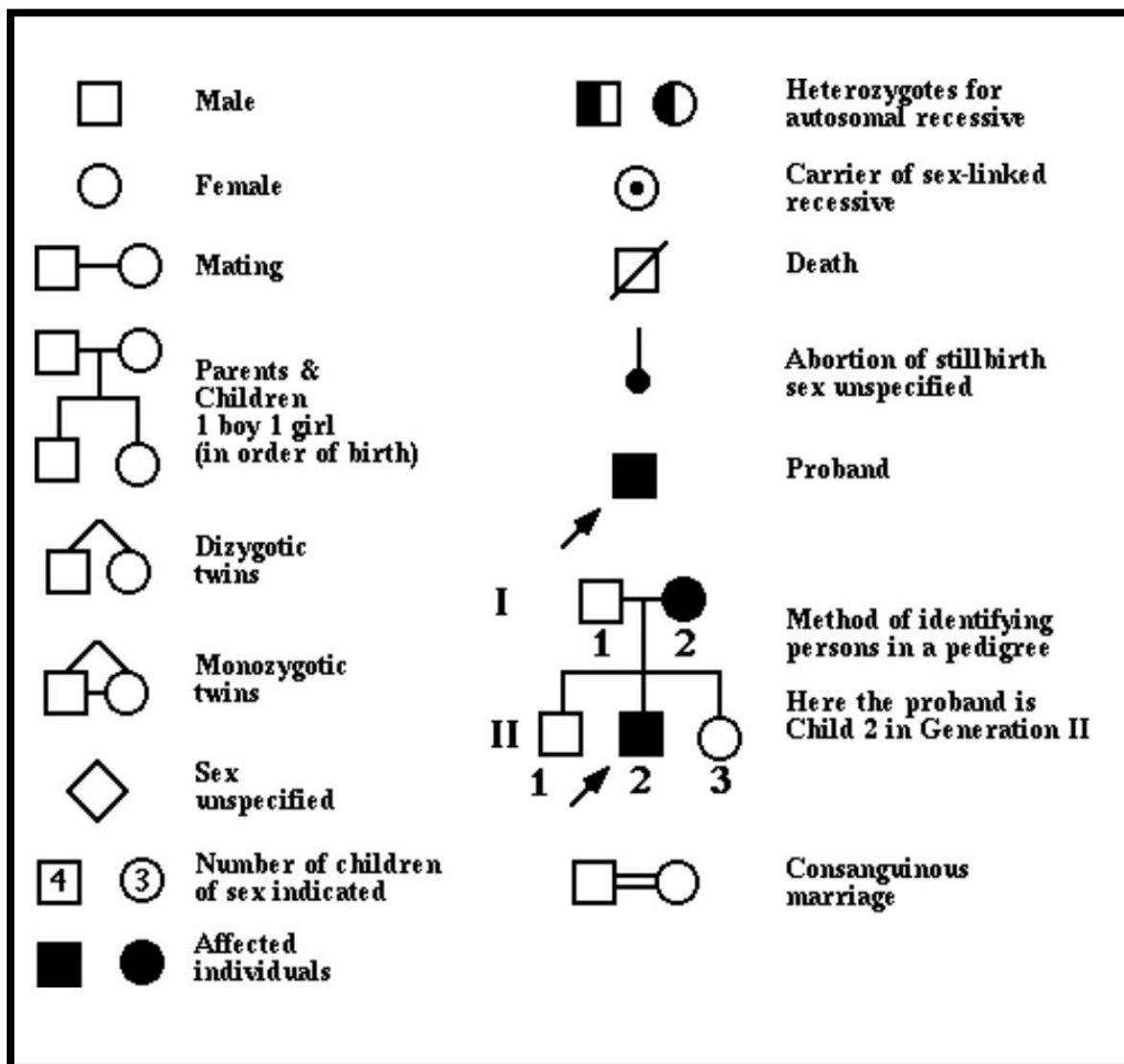


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Pedigree Symbols:

The internationally approved symbols for indicating males and females, marriages, various generations (I, II, III), etc., are given below.





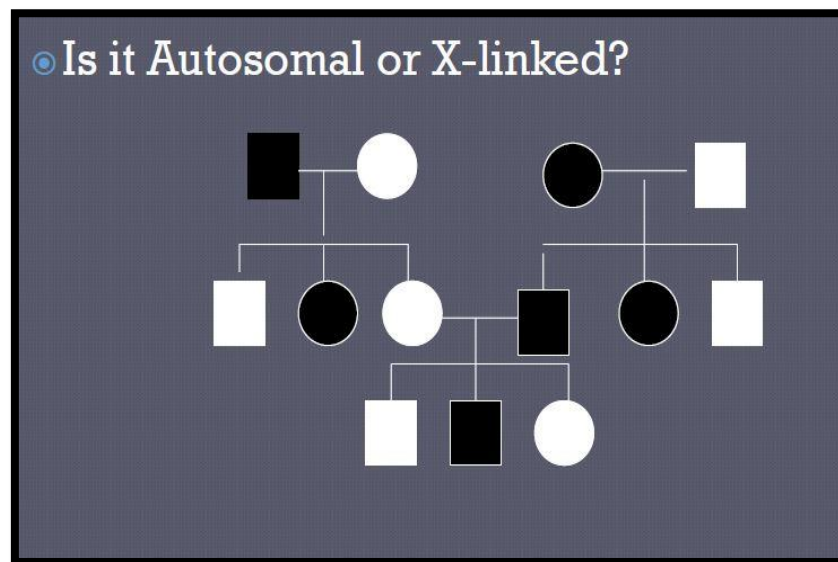
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Interpreting a Pedigree Chart

1. Determine if the pedigree chart shows an autosomal or X-linked disease.
 - If most of the males in the pedigree are affected the disorder is X-linked
 - If it is a 50/50 ratio between men and women the disorder is autosomal.

Example:



Answer : Autosomal



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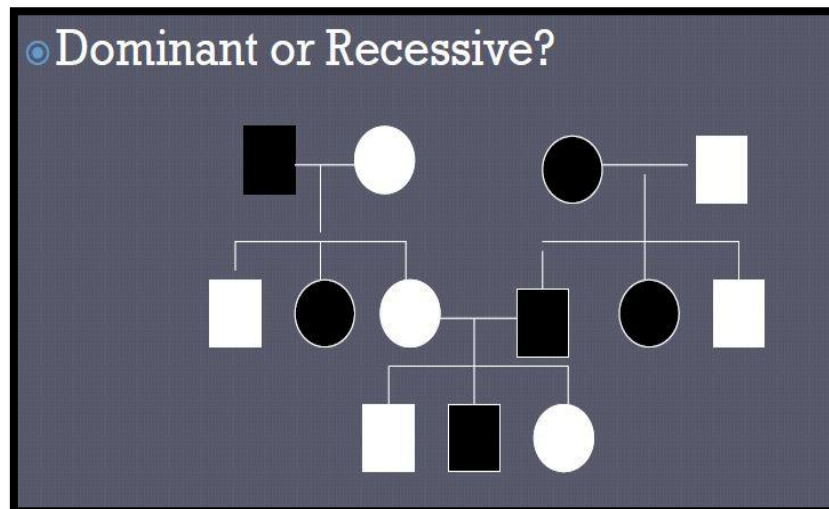


2. Determine whether the disorder is dominant or recessive.

- If the disorder is dominant, one of the parents must have the disorder.
- If the disorder is recessive, neither parent has to have the disorder because they can be heterozygous.

Example :

Answer: dominant



Answer: Recessive

