

Pedigree Analysis

Have you ever seen a family tree... do you have one??

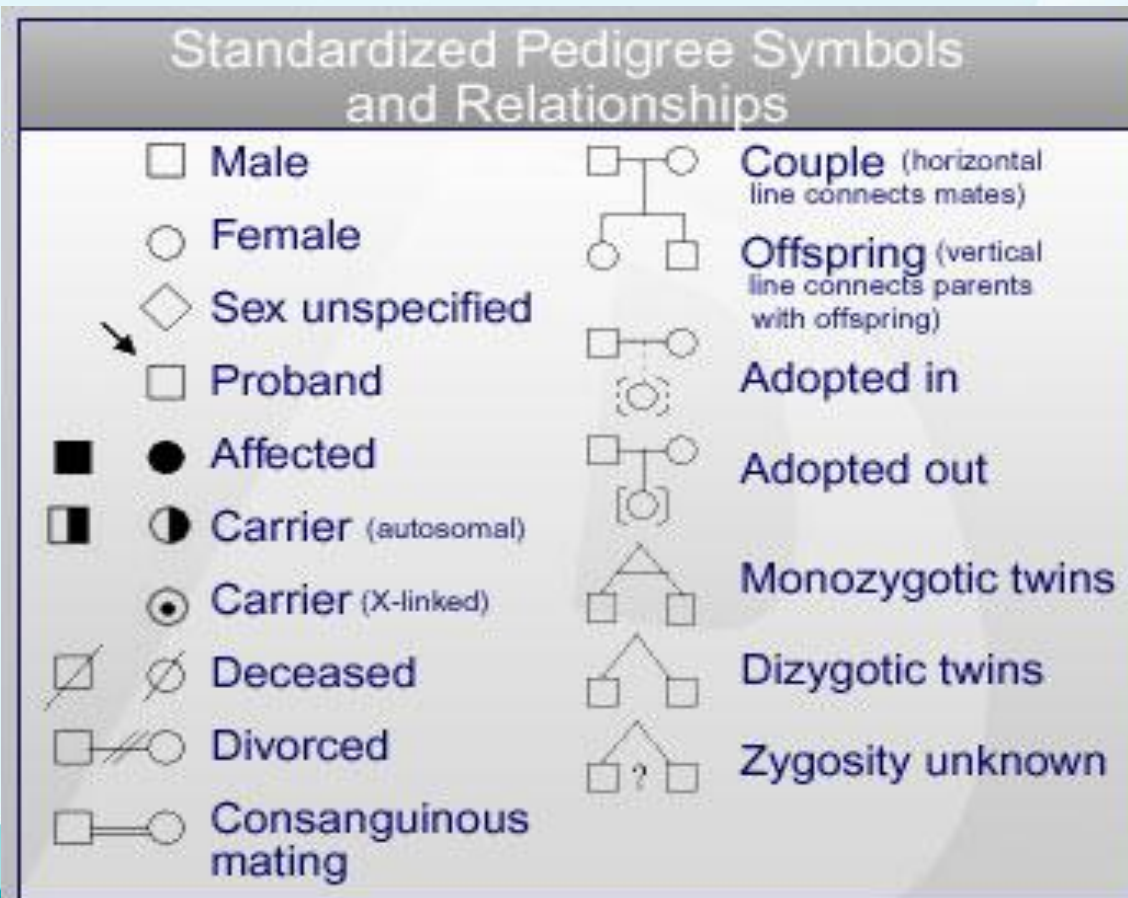
Graphic representation of family inheritance.

What is a pedigree?

- **Shows a pattern of inheritance in a family for a specific trait (phenotype)**
 - **Used to track the occurrence of diseases : Huntington's, cystic fibrosis, etc.**
 - **Genotypes can usually be determined by knowing if the person is affected or not**

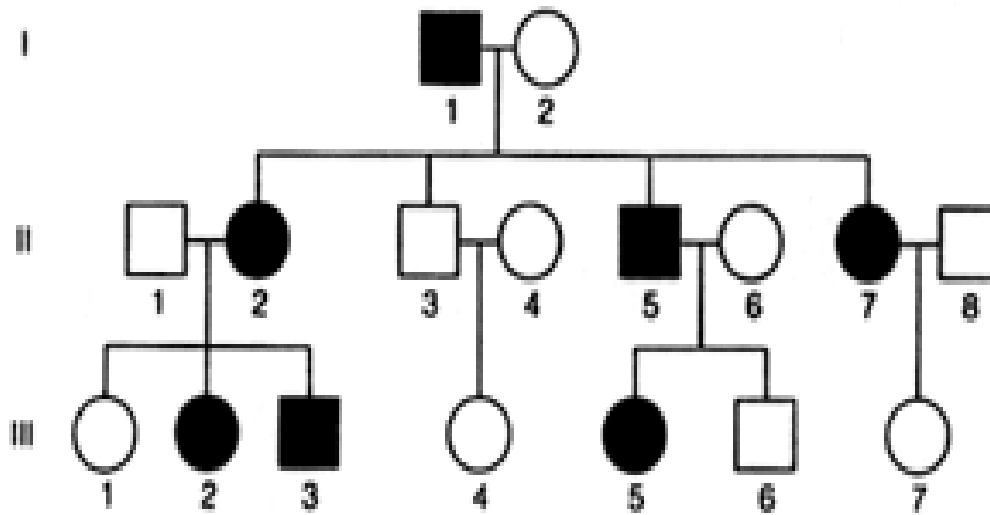
Pedigree Rules

- Generations are labeled with roman numerals
- Oldest individuals are listed first
- Symbols:



Inheritance patterns:

- **Dominant Pedigree**



The disease is passed from the father (I-1) to the son (II-5), this never happens with X-linked traits.

The disease typically occurs in three consecutive generations, this never happens with recessive traits.

Males and females are affected, with roughly the same probability.

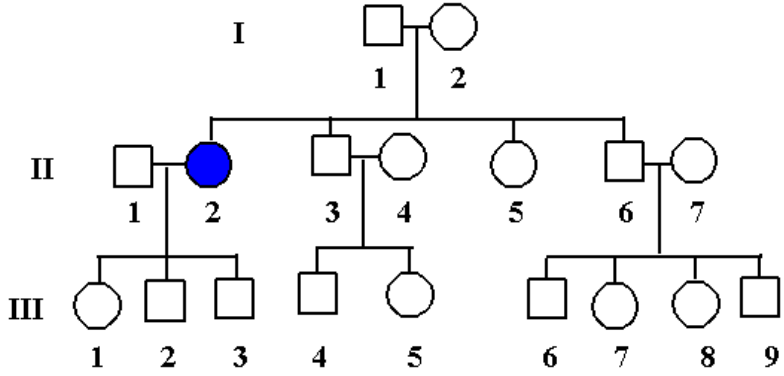
–**Examples: Polydactyly**

–**Huntington's disease**

Inheritance patterns:

• Recessive Pedigree

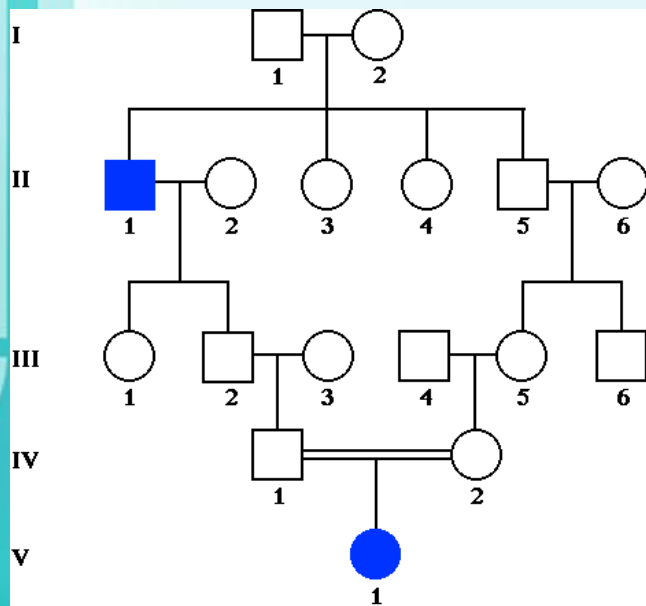
		Father's Gametes	
		D	d
Mother's Gametes	D	DD	Dd
	d	Dd	dd



Males and females are equally likely to be affected.

The trait is characteristically found in siblings, not parents of affected or the offspring of affected.

Parents of affected children may be related. The rarer the trait in the general population, the more likely a consanguineous mating is involved.

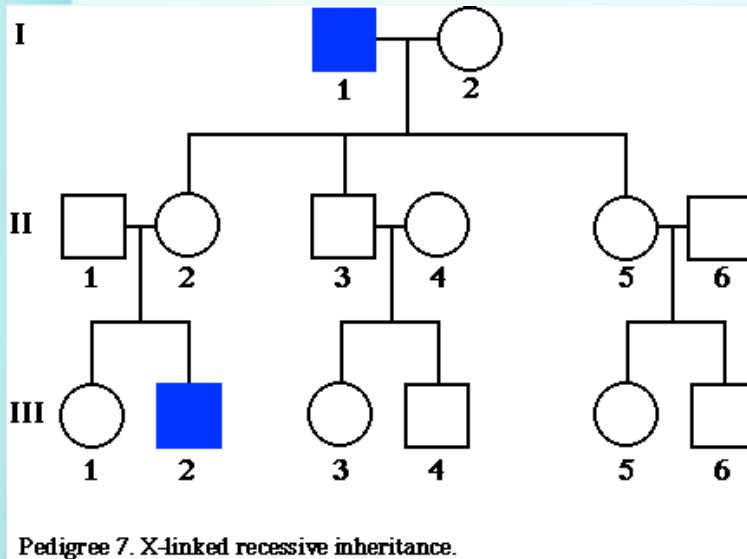


–Cystic fibrosis

–Tay-Sach's disease

Inheritance patterns:

- **Sex-linked recessive conditions**



The disease is never passed from father to son.

Males are much more likely to be affected than females.

Trait or disease is typically passed from an affected grandfather, through his carrier daughters, to half of his grandsons.

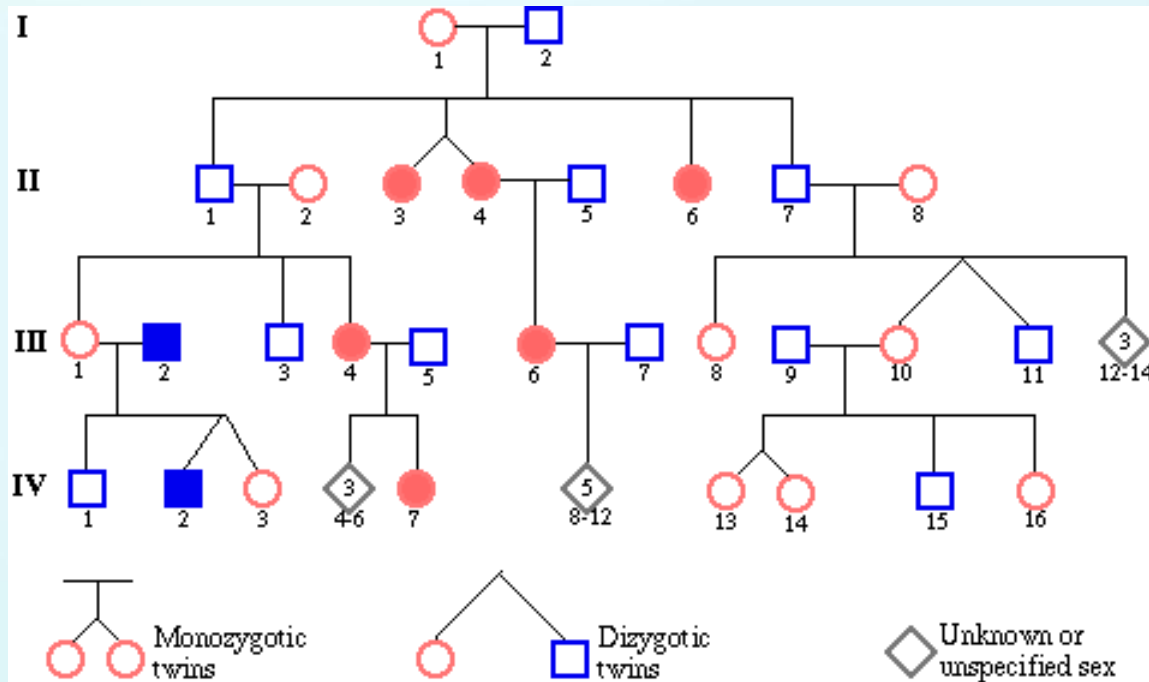
–Examples:

– Colorblindness

– Muscular Dystrophy

Sample pedigree:

- generations are numbered with Roman Numerals
- oldest offspring are on the left



How many males are present? How many females?

How many females show the trait being studied?

What is the sex of offspring III-9?

How many offspring did the generation I parents have?

What is the difference between the II-3 & 4 and IV-2 & 3?

Pedigree of Queen Victoria

