

Normal Karyotypes

Has 46 chromosomes for humans
Arranged in 23 pairs

Disjunction

Normal separation of Chromosomes and Chromatids during Meiosis I and Meiosis II (Anaphase I & II)

NON-disjunction

Nondisjunction during **Meiosis I**

NON-disjunction

Nondisjunction during **Meiosis II**

What does nondisjunction cause?

Missing Chromosomes – **Monomy**

- Embryo/Fetus will not survive
- Means 45 chromosomes
- Exception is this can occur on 23rd chromosome pair

Extra Chromosomes – **Trisomy**

- Means 47 chromosomes
- Down Syndrome (Trisomy 21)
- Patau Syndrome (Trisomy 13)
- Klinefelter's Syndrome (XXY)
- Turner's Syndrome (X-)
- XYY Syndrome
- And many more.....

Trisomy 21 – Down Syndrome


Extra Chromosome 21

Trisomy 13 – Patau Syndrome

Extra Chromosome 13

Symptoms can include

- Cleft lip or palate
- Close-set eyes -- eyes may actually fuse together into one
- Decreased muscle tone
- Extra fingers or toes
- Hernias
- Hole, split, or cleft in the iris
- Low-set ears
- Mental retardation
- Scalp defects (absent skin)
- Seizures
- Single palmar crease
- Skeletal (limb) abnormalities
- Small eyes
- Small head
- Small lower jaw
- Undescended testicle


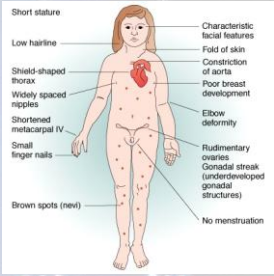


Klinefelter's Syndrome (XXY)

Extra Sex Chromosome "X"



Turner's Syndrome (X-)

XYY Syndrome

- XYY syndrome is characterized by an extra copy of the Y chromosome
- males with this condition may be taller than average
- This chromosomal change typically causes no unusual physical features
- Most males with XYY syndrome have normal sexual development and are able to father children

Jamie Lee Curtis

- XY male with Androgen Insensitivity Syndrome (AIS)
- resistant to androgens – the hormones responsible for male sexual development




QUESTIONS???