



## Consanguinity ©2003

Consanguinity is the term used to describe a mating between two individuals who have one or more recent ancestors in common. Children born to a consanguineous couple are at increased risk for health problems. The more closely related the parents, the higher the risk to their offspring. This risk applies **only** to immediate offspring of related individuals and not to their grandchildren or other family members.

The increased risk for genetic health problems is related to the possibility of passing on recessive genes. Genetic diseases are inherited in several different ways: dominant, recessive and X-linked. Children born to a consanguineous couple are primarily at higher risk for a recessive genetic disease. A recessive disease is a genetic condition caused by inheriting two copies of a non-working gene.

**All** individuals carry non-working genes for recessive conditions that can potentially cause disease. It is estimated that everyone carries at least 7-10 non-working genes. These genes rarely cause any problems in the carriers, because there is also a normal, working gene. In general, unrelated individuals have only a small risk for having children with a recessive genetic disorder. This is because there is only a small chance that each parent would carry the same recessive gene and that both parents would pass this same gene to their child.

When individuals are consanguineous (related), they have inherited some of their genetic information from the same family member. This leads to an increased chance that they would carry the same recessive gene and have a child with a recessive genetic disorder. First cousins for example, share approximately one-eighth ( $1/8$ ) of their genes in common. Children from a first-cousin mating will be genetically identical for one-sixteenth ( $1/16$ ) of their genetic material. If any of these identical genetic sites are comprised of recessive, disease-causing genes, the child will be affected with that disease. Therefore, there is a risk of 6% for first cousins to have a child with a birth defect, mental retardation, or genetic disease based upon their degree of relation. This is compared to a 2-3% general population risk that unrelated couples have for a child with a health problem. Individuals who are second cousins or who are more distantly related have no higher risk than the general population for a child with a health problem.

When couples belong to certain ethnic groups in which there is a known increased incidence of a specific genetic disease, it may be possible to screen them for this disease to determine if one or both are carriers. It is not possible to screen for all recessive diseases however so the increased risk for an affected child cannot ever be removed entirely. A genetic counselor or physician can suggest appropriate testing which may include blood drawing, ultrasound or prenatal diagnosis for certain genetic conditions.