DEFINITIONS:

Chondrodystrophy (CDDY) Phenotype: Includes a short-legged phenotype as well as abnormal premature degeneration of intervertebral discs. Autosomal semi-dominant for height. This is the known disease that affects Bedlington Terriers.

Intervertebral Disc Disease (IVDD) Autosomal dominant for intervertebral disc disease. Associated with CDDY.

Chondrodysplasia (CDPA) Phenotype: Dogs with chondrodysplasia (CDPA) have short legs; this phenotype is characteristic of many breeds such as Corgis and Dachshunds. This is not the known disease in Bedlington Terriers but listed as a reference for comparison.

FGF4 (Fibro Growth Factor Receptor 4).

Autosomal means a gene is located on a non-sex chromosome. Dogs have 39 pairs of chromosomes (78 total) and 38 pairs are autosomes, while the last pair (X and Y) determines sex. Because autosomal traits are not linked to sex, they affect male and female dogs equally.

Semi-dominant (more commonly known as semi-dominance or incomplete dominance) is an inheritance pattern where neither gene allele is completely dominant over the other. Instead of expressing a single parent's trait, the resulting physical trait (phenotype) is an intermediate blend or mix of both.

Alleles N = Normal CDDY = Chondrodystrophy. Dogs get one allele from each parent. Results are N/N, N/CDDY, or CDDY/CDDY.

Chondro: a combining form that means cartilage.

Dysplasia: abnormal growth or development of organs, tissues, or cells) *broadly*: abnormal anatomical structure due to such growth.

Dystrophy: any condition causing tissue degeneration, weakening, or abnormal growth. It stems from the Greek words *dys* (meaning bad, difficult, or faulty) and *trophy* (meaning nourishment or development).

Phenotype is observable or physical traits of an individual.

FACTS:

Why does Chondrodystrophy affect cartilage and not bone when it is phenotypically short-legged bones? **Chondrodystrophy** affects cartilage because it is fundamentally a disorder of cartilage development, specifically involving the growth plates where tough, flexible cartilage is meant to be converted into mature bone.

For **autosomal dominant disorders**, dogs with **one or two copies** of the disease variant are at risk of developing the condition. Inheriting two copies of the risk variant may make the risk higher or the condition more severe. They may produce puppies affected with the disorder if bred.

One can be a carrier or affected with CDDY without IVDD and vise versa.