

Hansen Type I Intervertebral Disc Disease: Greatest Risk Factors

The single greatest known risk factor for Hansen Type I Intervertebral Disc Disease (IVDD) is: **Premature degeneration (calcification) of the intervertebral discs caused by the CDDY (FGF4 retrogene on chromosome 12) mutation.**

This conclusion is supported by multiple studies, including the landmark work by Brown et al. (2017), which demonstrated that the **CFA12 FGF4 retrogene** is strongly associated with both:

- Chondrodystrophy (CDDY)
- Hansen Type I IVDD

The mutation causes discs to lose their normal gelatinous center (**nucleus pulposus**) at a very young age. Instead, the discs become dry, brittle, and often calcified, making them much more likely to rupture.

Other risk factors (in approximate order of importance)

1. **CDDY (FGF4 insertion on chromosome 12)** – by far the strongest genetic risk factor.
2. Breed predisposition (many predisposed breeds carry the same mutation).
3. Age (typically 3–7 years in affected breeds).
4. Obesity (increases mechanical stress).
5. Trauma or vigorous activity (usually the event that causes an already diseased disc to rupture rather than the cause of the disease itself).
6. Poor muscle condition and body condition.

One important point that is often misunderstood is that **jumping off the couch does not cause Hansen Type I IVDD in a dog with healthy discs**. It may trigger the rupture of a disc that has already degenerated because of genetics.

Are IVDD and Hansen Type I IVDD the same thing? No.

IVDD (Intervertebral Disc Disease) is an umbrella term.

It simply means **disease of the intervertebral discs** and includes several different conditions.

Hansen Type I IVDD is one specific form of IVDD.

Think of it like this:

IVDD = Heart disease

Hansen Type I IVDD = Heart attack

The second is one specific disease within a broader category.

The major types of IVDD

Hansen Type I

- Disc undergoes premature degeneration.
- Disc suddenly ruptures.
- Nucleus pulposus explodes into the spinal canal.
- Usually acute and painful.
- Strongly associated with **CDDY (FGF4 chromosome 12)**.

Typical breeds:

- Dachshunds
- French Bulldogs
- Beagles
- Cocker Spaniels
- Pembroke Welsh Corgis
- Basset Hounds
- Many others carrying CDDY

Hansen Type II

- Disc slowly bulges instead of rupturing.
- Fibrous outer ring protrudes gradually.
- Usually affects older, non-chondrodystrophic dogs.
- More chronic than sudden.

Common breeds:

- German Shepherd
- Labrador Retriever
- Doberman
- Large breeds

Acute Non-Compressing Nucleus Pulposus Extrusion (ANNPE)

- Healthy disc ruptures after severe trauma or strenuous activity.
- Little chronic degeneration.
- Usually seen in athletic dogs.

Hydrated Nucleus Pulposus Extrusion (HNPE)

- Soft hydrated disc material suddenly extrudes.
- Different mechanism than Hansen Type I.
- Less common.

Why CDDY is specifically linked to Hansen Type I

The FGF4 retrogene on chromosome 12 changes cartilage biology throughout the body. One consequence is that the discs lose their normal composition early in life.

Healthy disc:

- Soft gelatin center
- Flexible
- Absorbs shock

CDDY disc:

- Early degeneration
- Loss of water
- Fibrosis
- Calcification
- Brittle
- Eventually ruptures

Because this degeneration occurs **before the disc ruptures**, many veterinary neurologists consider **CDDY to be a disease of the intervertebral disc itself**, while Hansen Type I IVDD is the clinical event that occurs when one of those diseased discs herniates.

For Bedlington Terriers

This distinction is especially important in current discussions about Bedlington Terriers. A dog with the **CDDY mutation** has **not necessarily developed Hansen Type I IVDD**, but it **has an increased genetic predisposition to premature disc degeneration**, which is the pathological hallmark of Hansen Type I IVDD.

In other words:

- **CDDY** → predisposes discs to degenerate.
- **Disc degeneration** → increases the risk of rupture.
- **Disc rupture** → Hansen Type I IVDD.

Therefore, not every CDDY-positive dog will develop clinical IVDD, but the mutation significantly increases the lifetime risk because it changes the biology of the intervertebral discs.

This distinction is why many veterinary researchers describe **CDDY as the major inherited risk factor for Hansen Type I IVDD**, rather than considering the two terms synonymous.

Key takeaways:

- **IVDD** = a broad category of intervertebral disc diseases.
- **Hansen Type I IVDD** = a specific type of IVDD characterized by sudden extrusion of degenerated disc material.
- **The strongest known inherited risk factor for Hansen Type I IVDD is the chromosome 12 FGF4 retrogene (CDDY), which causes premature degeneration of the intervertebral discs.** This association has been consistently demonstrated across numerous breeds and is one of the strongest gene–disease associations identified in canine orthopedics.