Information on Genetic Diseases in the Golden Retriever

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In recent years, there has seemed to be in increase in the number of genetic problems affecting various dog breeds. Certainly over time, genetic mutations can occur and new problems can develop, but genetic problems have been around since the evolution of our domestic dogs and it is only with recent advancements in science and diagnostics that more information has become available to the dog breeder. Not every genetic disorder has the same impact on a animal and it is up to the breed clubs and breeders to establish a hierarchy or priority list of the most life-affecting disorders and make positive steps to control and/or eradicate these problems. Progress has been made in many areas but there is a long way to go. To quote George A. Padgett, DVM in the introduction to his book *Control of Canine Genetic Diseases (c) 1998,* on preventing serious genetic diseases in dogs:

"You need three things to accomplish this task: knowledge, information and honesty. All three are within your control."

There are NO dogs and NO lines that are free and clear of genetic diseases. Below is a list of some of the health disorders affecting Golden Retrievers, which I have been able to assemble from books, the internet and personal knowledge. The list is not definitive, as it does not include genetic defects found in puppies, such as cleft palate, umbilical hernia, ectopic ureters, etc. Dr. Padgett lists 98 genetic disorders of Golden Retrievers in his book, many of which I have never encountered or heard of before so below is a basic list of more commonly seen issues.

- Eye disease (including lid disorders):
    - Retinal dysplasia; Hereditary cataract; Progressive retinal atrophy (PRA 1 & 2 and PRA-prcd); Primary glaucoma, Pigmentary uveitis, Entropion/ectropion; Distichiasis.
- Hip Dysplasia (malformation of the hip joints causing pain and disability)
- Elbow dysplasia (malformation of the elbow joint causing pain and disability)
- Atopy/skin allergies (hypersensitivity to pollens and other protein particles, causing intense itching and skin damage)
- Heart disease: Sub-aortic stenosis (narrowing of the heart valve); Pericardial effusion (fluid around the heart)
- Ichthyosis (can cause thickening of the skin and pads and rough, scaly skin)
- Cruciate disease (damage to the ligaments of the stifle joint in the hind limbs, causing pain and lameness)
- Cancer:
    - malignant hystiocytosis (a multi system, rapidly progressing cancer); lymphoma; hemangiosarcoma (aggressive malignant tumour of the soft tissue blood cells); melanoma (oral, eye), mast cell tumour; soft tissue sarcoma; thyroid; trichoepithelioma (skin tumor)
- Idiopathic epilepsy
- Osteochondrosis (abnormalities of bone and cartilage in various joints, causing pain and lameness, e.g. OCD)
- Von Willebrands Disease (clotting disorder)
- Hypothyroidism (thyroid insufficiency – susceptibility to infections and effects on various organs of the body – can be severe and prolonged)
- Horner's syndrome (pupil of one eye smaller and eyelids abnormal)
- Acral lick dermatitis
- Extraocular myositis (autoimmune disease)

Along with advancements in detection and diagnosis, there has been tremendous progress in the development of DNA testing and establishment DNA markers and of modes of inheritance. Breeders now have access to new DNA testing to determine the health of their breeding stock and to assist with making breeding decisions that will produce healthy offspring. There is ongoing research concerning the life-affecting eye disorder Pigmentary Uveitis but unfortunately no DNA marker has yet been determined. However, there is DNA testing for Golden Retrievers available for Degenerative Myelopathy, Muscular Dystrophy, the eye disorders prcd-PRA, PRA 1 and PRA 2, and Ichthyosis, a dandruff-like skin condition.

While it may not always be in the best interest of the breed to reproduce from affected dogs, DNA testing will allow exceptional affected dogs to be bred to clear dogs to reduce the number of affected dogs in the population and maintain genetic diversity. Likewise, breeding DNA tested carriers to DNA clear dogs will not produce affected dogs, so breeders can make headway in eliminating the numbers of affected dogs in the breed.

Also of great importance, is the sharing of test results, in order for breeders to be aware of accurate information when making breeding decisions. OFA will publish submitted results of testing from organizations such as OptiGen, Antagene and the Animal Health Trust and others on their database. For a complete list of OFA acceptable labs see: http://www.offa.org/dna_labs.html

The articles and web sites listed below will offer further information on testing and the disorders and how they affect the dogs.

Registries for Genetic Testing Results of Golden Retrievers:

Orthopedic Foundation for Animals: http://www.offa.org/

Golden DNA.org: http://www.goldendna.org/

Information on Genetic Disorders, DNA testing, etc.

Note that OptiGen and the Animal Health Trust offer various discounts for groups and clinics throughout the year which individuals can join. These are the two organizations that I am familiar with and others may also offer discounts. Approved testing labs are listed on the OFA website.

Animal Health Trust (UK): http://www.aht.org.uk/cms-display/genetics_canine.html

- Progressive Retinal Atrophy 1
- Progressive Retinal Atrophy 2

Optigen DNA Testing: http://www.optigen.com/index.html

- Golden Retrievers - OptiGen® *prcd*-PRA, GR_PRA1, GR_PRA2 & Ichthyosis tests
- By going to the OptiGen site under "**Tests**" and clicking on the various tests for Golden Retrievers, you will find information and statistics on the various disorders.

Article on PRA and PRCD in Golden Retrievers: http://www.grca.org/health/pra.html
Article on PRA and Ichthyosis testing: http://www.grca.org/pdf/health/HGbreakthroughs.pdf
Article on Ichthyosis: http://grca.org/pdf/health/Ichthyosis.pdf
Article on Degenerative Myelopathy: http://www.caninegeneticdiseases.net/DM/basicDM.htm

Research on Inherited Golden Retriever Disorders

If you find yourself with an affected dog, there are many ongoing research projects that would appreciate your support. Future generations of Golden Retrievers will be better off with help from those who step up to assist the researchers. Check out the web links below.

Golden Retriever Health Research: http://grca.org/health/research-adv.html

Participating in Research: http://grca.org/health/research.html

http://optigen.com/opt9_research.html (Cataract, PRA and Iris melanoma)

http://grca.org/health/uveitis.html (Pigmentary uveitis research)

The following books may be of interest:

Willis, Malcolm B. Practical Genetics for Dog Breeders. H.F. & G. Witherby Ltd., 1992.

Padgett, George A. Control of Canine Genetic Diseases. Howell Book House, 1998.