EYE HEALTH IN BORDER COLLIES

The British Veterinary Association / Kennel Club / International Sheep Dog Society (BVA/KC/ISDS) Eye Scheme

National Border Collie Council
National Show, Queensland, Australia
September 2024

https://www.bva.co.uk/canine-health-schemes/hereditary-eye-disease-in-dogs/

EYE HEALTH IN BORDER COLLIES

THE BVA/KC/ISDS EYE SCHEME

The Eye Scheme is based on routine clinical examination of the eye and can identify a range of ocular anomalies and abnormalities, both inherited and non-inherited, based on their appearance – the phenotype

In addition, the Eye Scheme includes screening of the adnexa (eyelids, lacrimal system, orbital and periorbital regions)

DNA laboratory testing may identify the genetic defect

- the genotype (e.g. *NHEJ1* gene in CEA)

- DNA testing and eye examination should be regarded as complementary, one does not replace the need for the other

BRITISH VETERINARY ASSOCIATION / KENNEL CLUB / INTERNATIONAL SHEEPDOG SOCIETY (BVA/KC/ISDS) EYE SCHEME - BORDER COLLIE

All breeds, both purebred and crossbred, can be examined under the UK BVA/KC/ISDS Eye Scheme (established around 1966)

Involves routine examination of both eyes and screening of the adnexa (eyelids, tear film, orbital and paraorbital regions)

A mydriatic (tropicamide 1%) is used to dilate the pupil prior to routine examination

Routine examination (in light and dark) involves naked eye inspection, use of a focal light source, slit lamp biomicroscope, indirect and direct ophthalmoscope

Examination of puppies is conducted as a litter screen (5-12 weeks of age)

Adults should be examined before the dog is bred from and repeated as a minimum when the dog is 8 years or older

Ideally, repeat examination in bitches each time they are to be bred from and in popular sires annually to identify later onset disease and provide valuable longitudinal information

Gonioscopy (examination of the drainage angle) is used to check for goniodysgenesis and is performed before tropicamide is applied for routine examination. As the drainage angle may change in appearance with age three examinations are recommended (e.g. 1 year , 4 years and 7-8 years)

EYE EXAMINATION MAY REVEAL

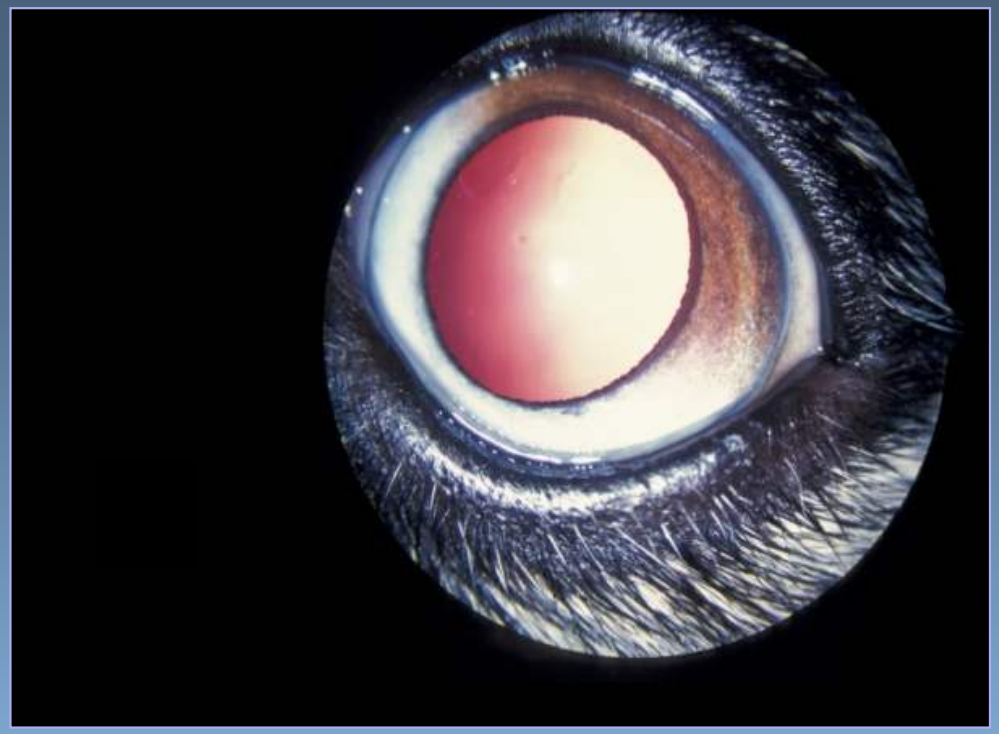
- Normal eye and variants
- Anomalies of no clinical significance
- Abnormalities of clinical significance
- Emerging eye diseases that may be inherited
- Known inherited eye disease

Normal puppy

The tapetum has yet to develop in this 5 week- old- puppy

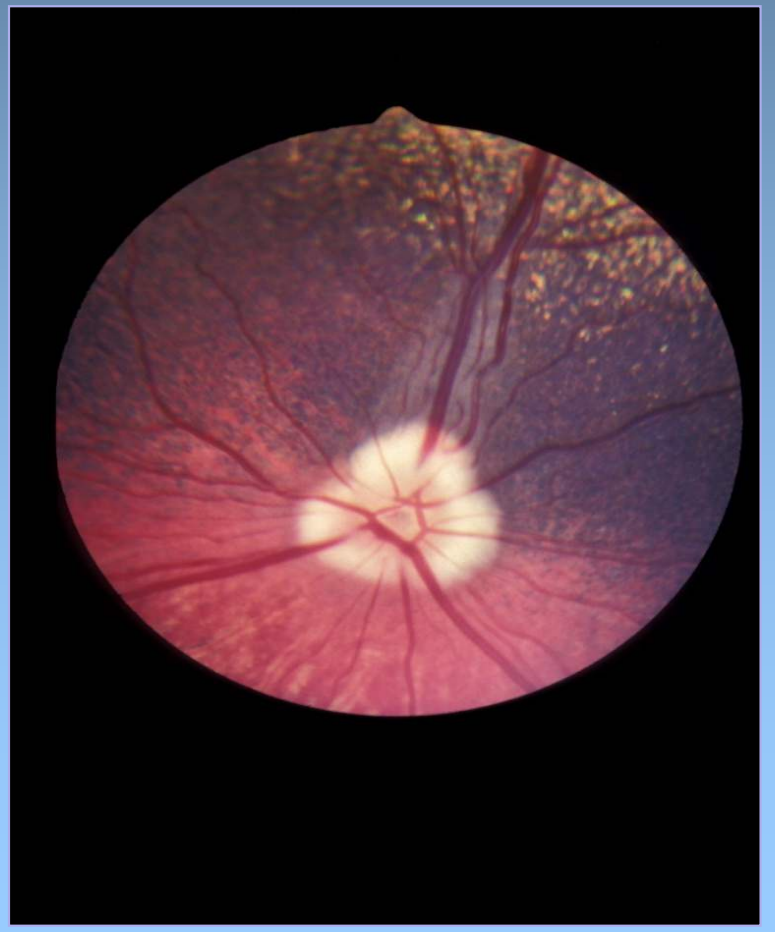
Normal colour dilute (subalbinotic) eye adult

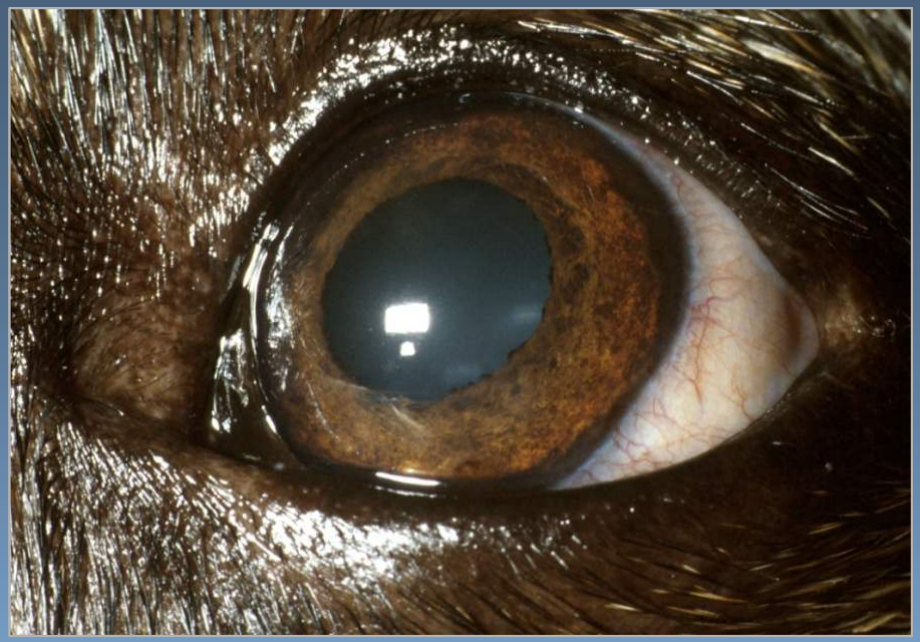
No tapetum is present in the colour dilute eye



Normal adult Border Collie

Note the reduced pigment ventrally in both the iris and the ocular fundus





Normal adult Border Collie

Normal retinal vasculature

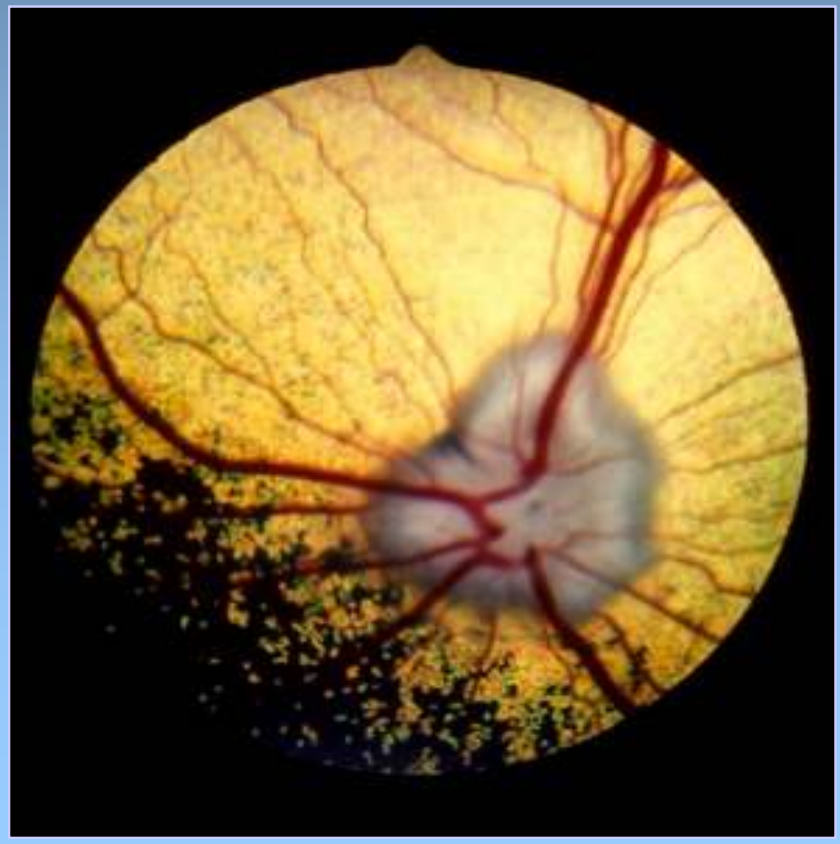
Normal optic disc (optic nerve head)

Normal tapetal fundus (yellow)

Normal non-tapetal fundus (black)

Normal aged Border Collie

Senile nuclear sclerosis of the lens - the centre of the lens (nucleus) appears grey, but the lens opacity has little obvious impact on vision



SOME OF THE INCIDENTAL FINDINGS –RECORDED AS 'SIGHTINGS' IN THE BORDER COLLIE

- Previous traumatic injury – mainly inactive, but occasionally active
- Distichiasis
- Chronic superficial keratoconjunctivitis (pannus)
- Lens: suture line and suture tip opacities / cataract (commonest anterior cortical)
- Congenital remnants - persistent pupillary membrane, primary vitreous
- Retinopathies: GPRA-like appearance (some unilateral), some described as Working Dog retinopathy
- Retinopathies: Retinal lesions described as focal and multifocal retinal dysplasia
- Inactive chorioretinopathy lesions (unilateral and bilateral, often multifocal e.g.T canis)

- **Sightings are non-certified conditions that are observed and recorded by panellists when examining dogs under the BVA/KC/ISDS Eye Scheme. They are summarised annually by the British Veterinary Association**
- **The sightings of cataract would benefit from further investigation**
- **The sightings of abnormalities affecting the ocular fundus are the commonest incidental observations, described in a number of different, sometimes overlapping, ways. They comprise the most urgent area for further study**

Points to ponder

Commonest sightings under the Eye Scheme

Some of the common sightings may signal emerging disease and warrant further investigation

Further investigation would ideally include assessment of environmental factors, nutrition, worming regime, drug usage, medical conditions, immune-mediated disorders, neoplasia and infectious causes (e.g. viral, bacterial, fungal, parasitic)

Possible inheritance should not be assumed until other factors have been explored – a PRA-like appearance is insufficient proof of inheritance

‘Sightings’

1. Chronic Superficial Keratoconjunctivitis (pannus)

2. Superficial foreign body (thorn)
Note the constricted pupil (reflex uveitis)
associated with the foreign body

‘Sightings’

There are many causes of cataract in all breeds of dog

Hereditary cataract (HC) has not been confirmed in the Border Collie

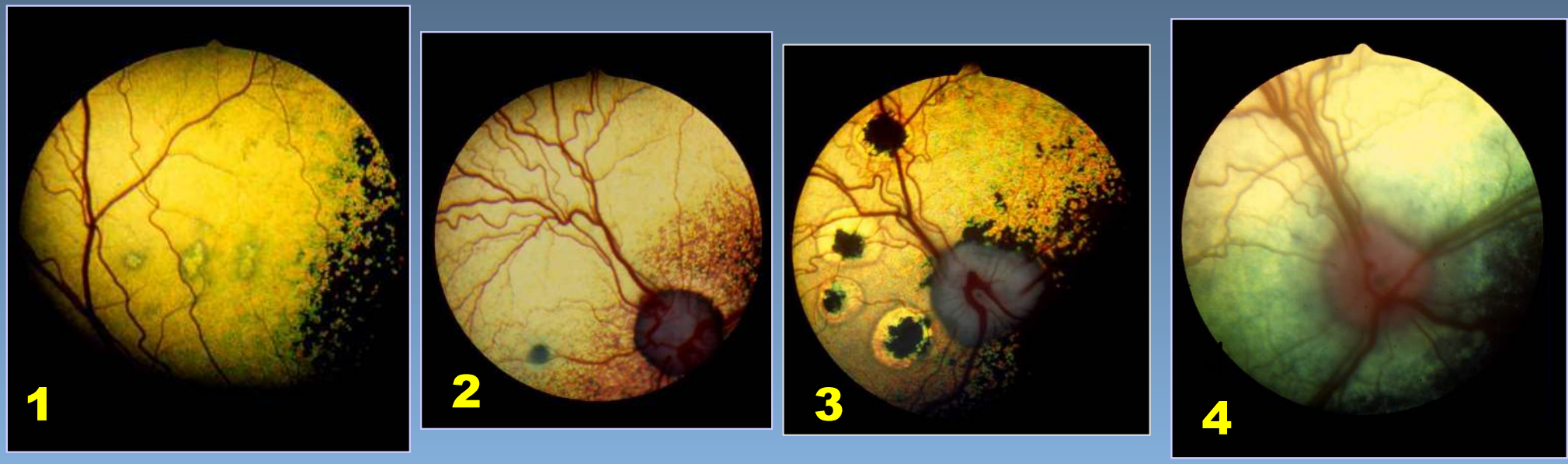
Anterior cortical cataract is the commonest lens ‘sighting’

Careful recording of the appearance and any changes over time could be part of further investigation if the cause is not obvious

Border Collie ocular fundus
'Sightings' and general observations

- Under the Eye Scheme the commonest 'sighting' involves lesions of the ocular fundus
- Routine examination of a wider population of working Border Collies indicated a similar range of appearances with unilateral or bilateral inactive chorioretinopathy as the most frequent ocular manifestation but, less commonly, granulomata and perivascular cuffing indicated active inflammation
- The retinal and choroidal response to insult is limited; thus the later changes in appearance are very similar, making definitive diagnosis based on appearance impossible
- Published papers support toxocariasis *(Toxocara canis)* as a likely cause of the most frequently observed focal and multifocal lesions
- Most affected dogs are working animals from a rural setting with a preponderance of male dogs

Examples of inflammatory changes in the ocular fundus



1. Labrador Retriever - Canine distemper retinochoroiditis - active inflammation

2. Border Collie -Toxocariasis - single active focal granulomatous lesion (encysted *Toxocara canis* larva)

3. Border Collie - Four inactive chorioretinopathy lesions *(Toxocara canis)*

4. Collie Cross - Optic neuritis , vitritis and chorioretinitis - toxoplasmosis

Example of inherited retinopathy in breed other than Border Collie
Multifocal Retinal Dystrophy (MRD)

English Springer Spaniel

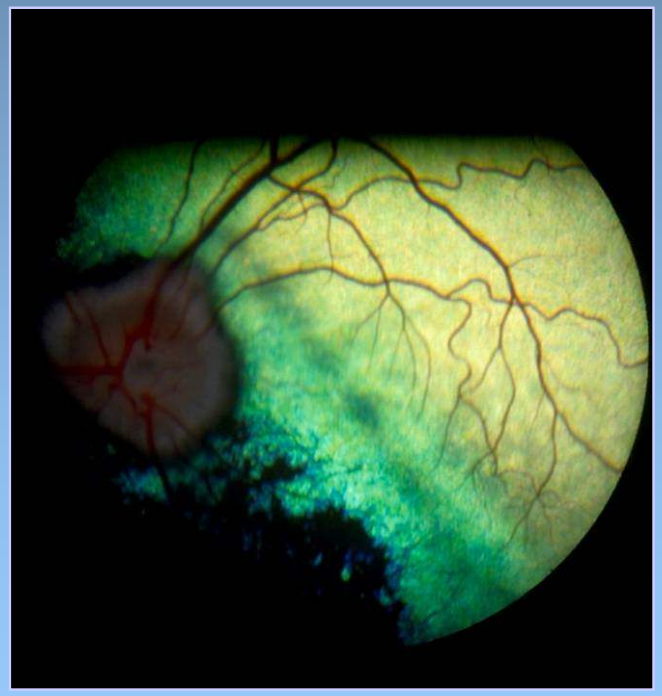
The focal lesions on the right of the dorsal primary retinal vessels could be confused with those associated with ocular larva migrans, but on the left there are vermiform lesions and retinal rosettes more typical of Multifocal Retinal Dysplasia

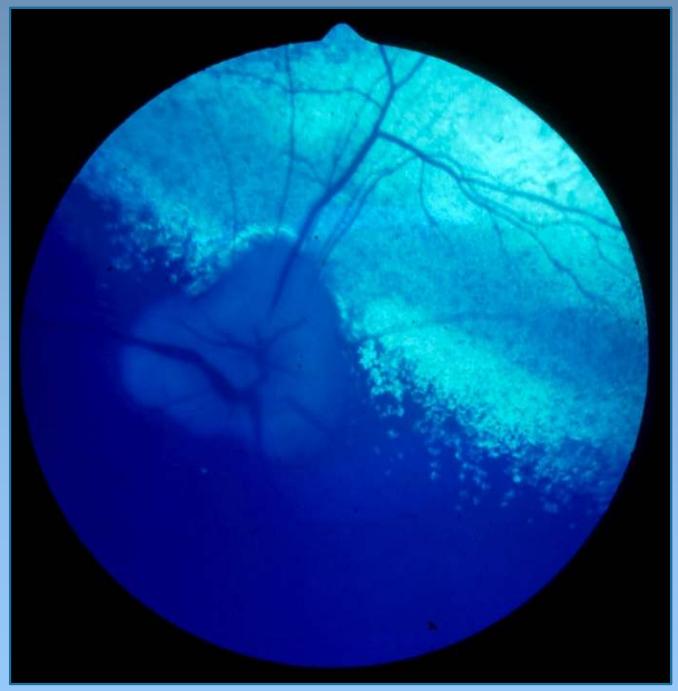
GENERALISED PROGRESSIVE RETINAL ATROPHY (GPRA)

- Generalised Progressive Retinal Atrophy is a generic term for a range of genetically heterogeneous inherited retinal diseases affecting many breeds of dog
- It is a disease of the retinal photoreceptors and both developmental (dystrophies) and degenerative types are recognised
- Many of the causal gene mutations have been identified
- The modes of inheritance identified are autosomal recessive, autosomal dominant and X-linked
- There is, as yet, no definitive proof of classical inherited Generalised Progressive Retinal Atrophy in the Border Collie
- The appearance of the ocular fundus in some dogs diagnosed as having GPRA is more indicative of inflammatory retinopathy than GPRA

Examples of inherited retinopathies in breeds other than the Border Collie – Progressive Retinal Atrophy (PRA)

Normal

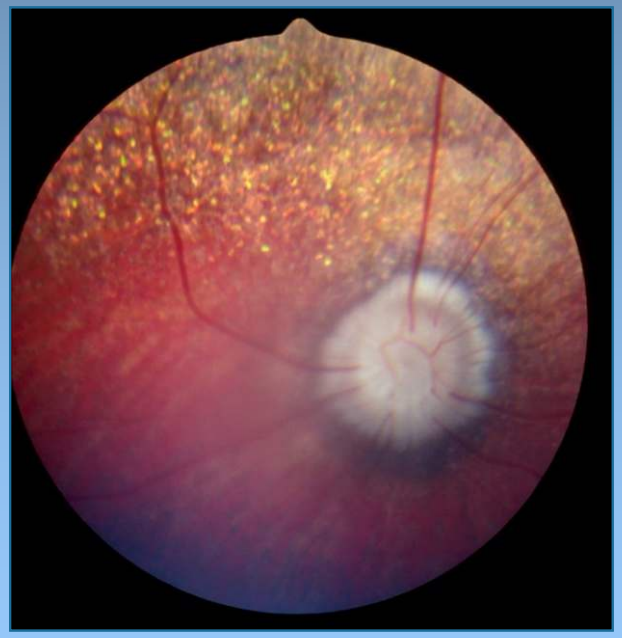




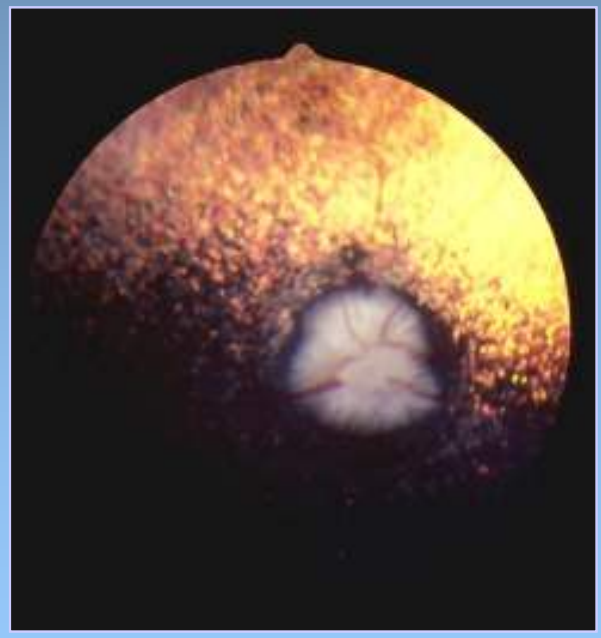
Cocker Spaniels

Examples of inherited retinopathies in breeds other than the Border Collie – Progressive Retinal Atrophy (PRA)

Normal

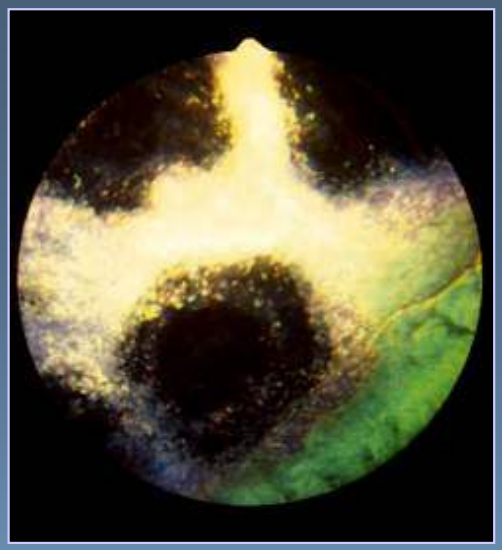


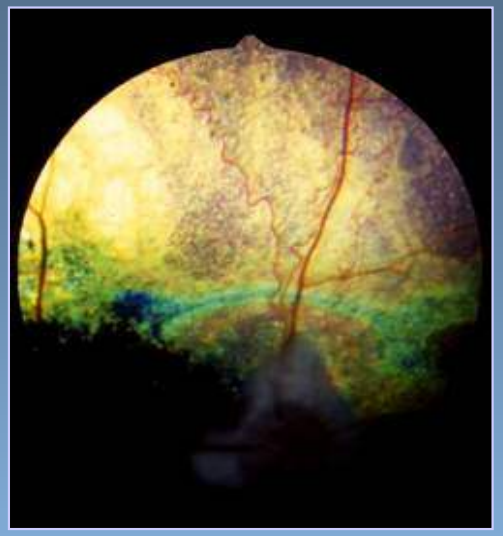
Cocker Spaniel

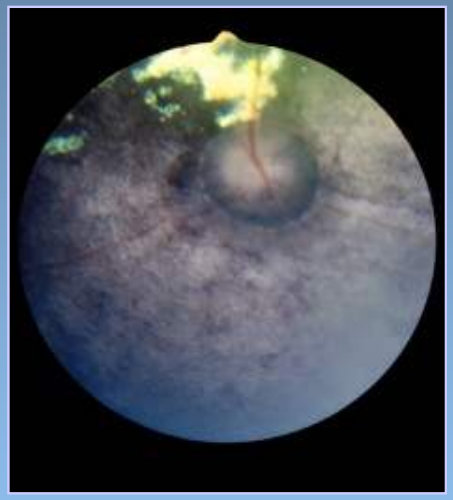


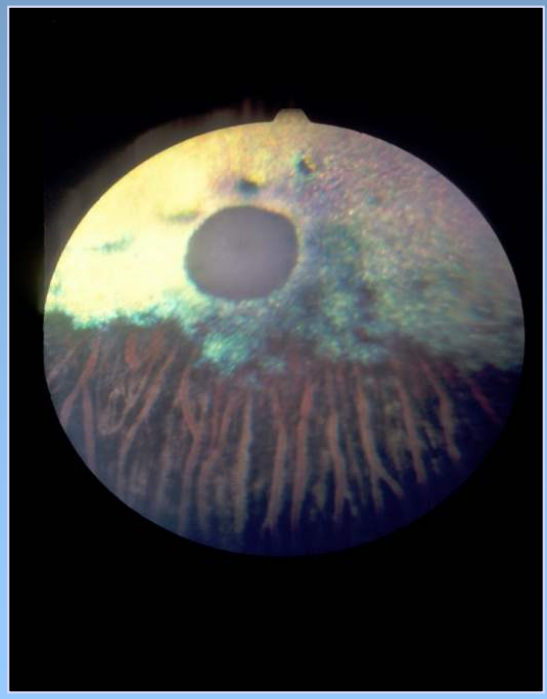
Miniature Poodle

End stage retinal degeneration irrespective of the cause – all these dogs were blind



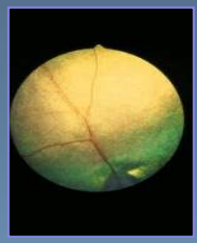






Border Collie Complexities

Classical Progressive Retinal Atrophy (PRA) is a painless bilateral, symmetrical and progressive condition of the photoreceptors that has been recognised and recorded in many breeds of dog, but NOT definitively in the Border Collie

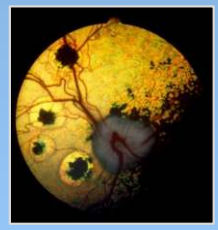


Classical PRA is usually inherited as an autosomal recessive trait and DNA test confirmation is available in many breeds but NOT the Border Collie

XLPRA3 was described as a new XLPRA in the Border Collie by Vilboux et al (2008), all were working dogs and the mutation has yet to be identified

A paper (2021) entitled "Is it canine DUSN?" by Gus Aguirre and Kevin Kazacos reviewed the role of ocular larva migrans (OLM) suggesting that Diffuse Unilateral Subacute Neuroretinitis (DUSN) first described in children and young adults in the late 1970s could be attributed to nematode larvae such as *Toxocara canis* in dogs. They concluded that DUSN was typical of ocular larva migrans (OLM)

Other publications have confirmed this interpretation of DUSN in dogs, especially working dogs. For example, papers on multifocal retinitis in New Zealand sheep dogs and Border Collies



Focal/multifocal retinal lesions, unilateral or bilateral and asymmetric, are frequently part of the presentation

Impaired vision and blindness are a feature of advanced disease

The ocular fundus abnormalities are more commonly observed in male dogs.

Studies have indicated differences in innate and adaptive immunity between males and females

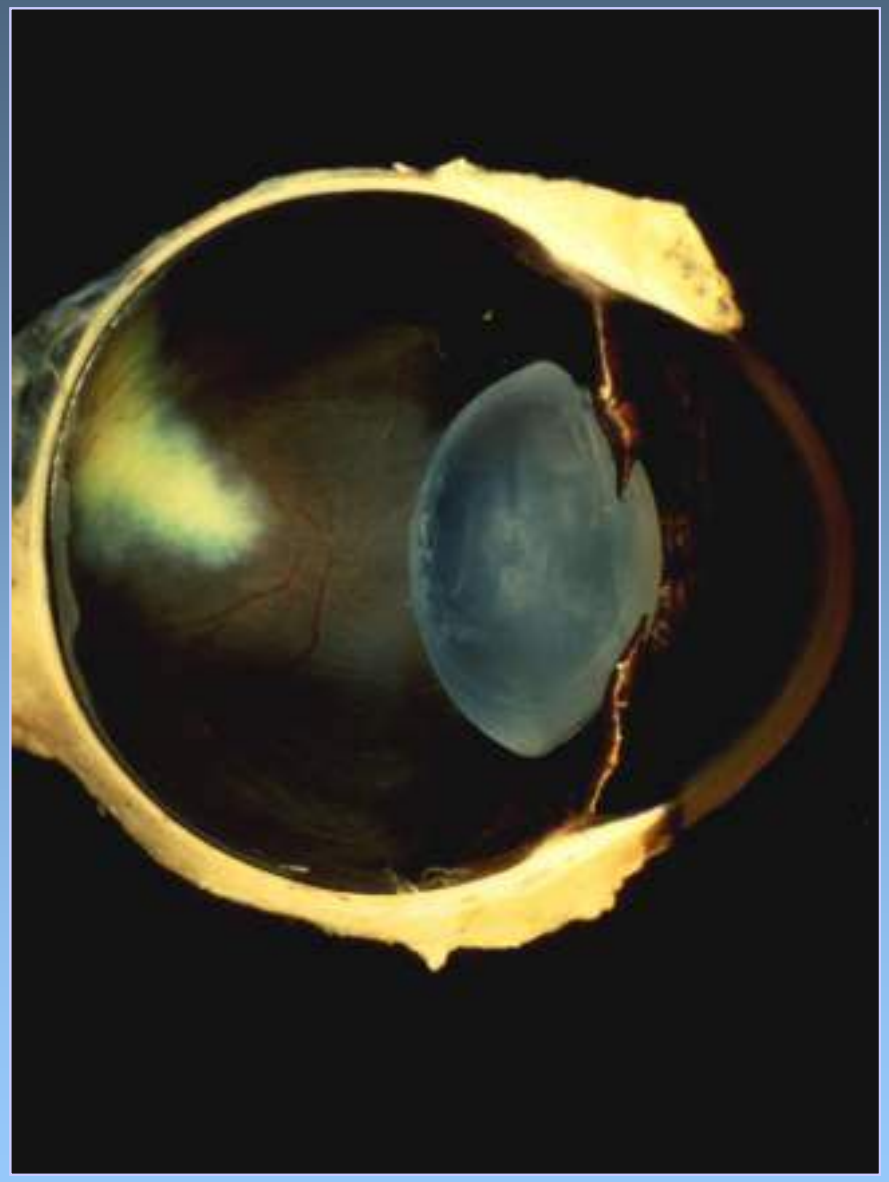
Investigation of potential inheritance is just one aspect of attempting to identify the cause

When do we suspect that a disorder is inherited in a given breed?

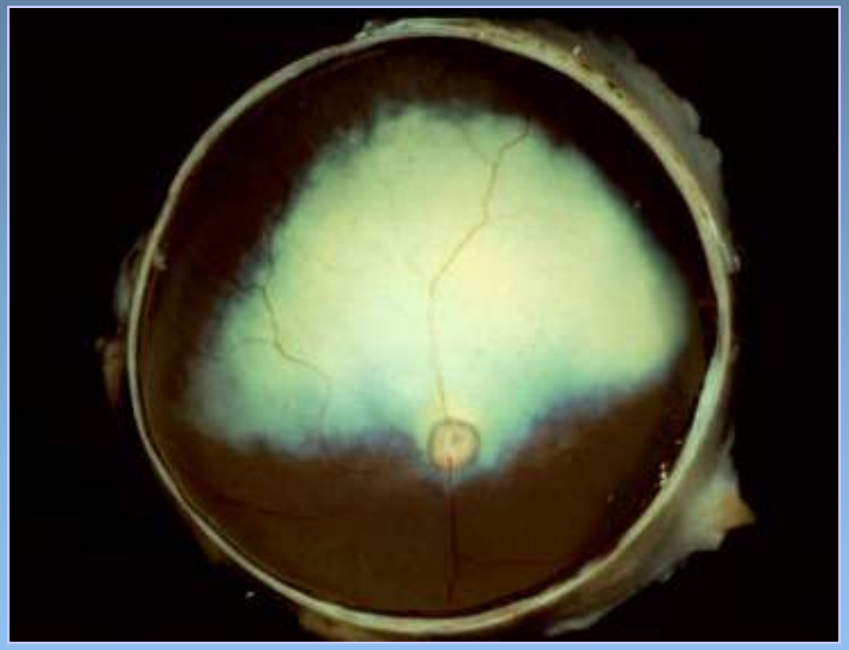
1) When the frequency is greater than in other breeds
2) When the frequency increases in a given breed as a whole
3) When the frequency is greater in related dogs within a breed
4) When it has a characteristic appearance and location
5) When it has a characteristic age of onset and course of progression (predictable stages of development and time for each stage to develop)
6) When it looks identical to an entity which has been proven to be inherited in another breed

With acknowledgements to the late Professor Donald F Patterson

"Everything is inherited until proven otherwise"



THE NORMAL CANINE EYE



With acknowledgements to JRB Mould

EYE EXAMINATION AND LABORATORY TESTING UNDER THE EYE SCHEME

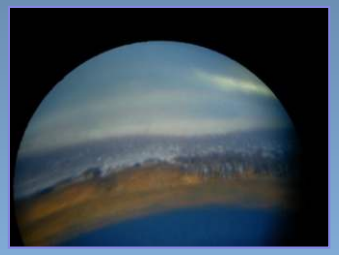
BORDER COLLIE

Collie Eye Anomaly (CEA) DNA test (*NHEJ1* gene) available

Present from birth, litter screening at 5-6 weeks

Goniodysgenesis /Pectinate Ligament Abnormality (G/PLA) strongly associated with *OLFML3* mutation in Border Collie

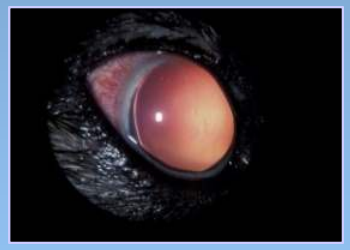
Present from birth, but not confirmed until gonioscopy is performed from around 6 months onwards



Primary Lens Luxation (PLL)

Clinical diagnosis made between 2-8 years of age

No DNA test in Border Collie



Retinal Pigment Epithelial Dystrophy (RPED)

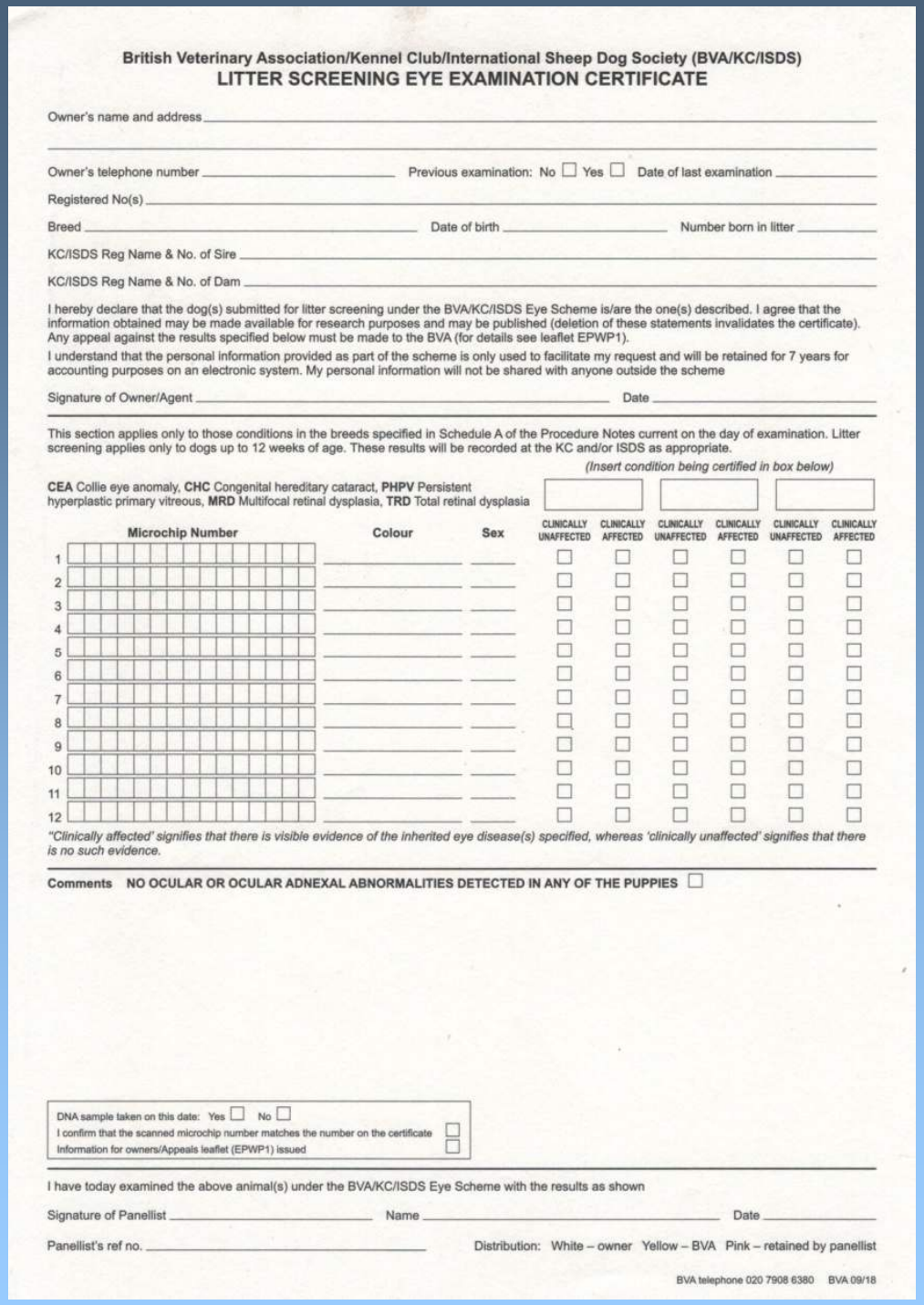
Age of onset approximately 18 months onwards

No DNA test in Border Collie

Precise age of onset for acquired conditions uncertain

LITTER SCREENING EYE EXAMINATION CERTIFICATE - BORDER COLLIE Condition certified CEA

- Collie Eye Anomaly (CEA) is the only congenital inherited condition of Border Collies screened for in litters of puppies
- Ocular abnormalities observed are recorded on the litter screening certificate



British Veterinary Association/Kennel Club/International Sheep Dog Society (BVA/KC/ISDS)
LITTER SCREENING EYE EXAMINATION CERTIFICATE

Owner's name and address _____

_____

Owner's telephone number _____ Previous examination: No ☐ Yes ☐ Date of last examination _____

Registered No(s) _____

Breed _____ Date of birth _____ Number born in litter _____

KC/ISDS Reg Name & No. of Sire _____

KC/ISDS Reg Name & No. of Dam _____

I hereby declare that the dog(s) submitted for litter screening under the BVA/KC/ISDS Eye Scheme is/are the one(s) described. I agree that the information obtained may be made available for research purposes and may be published (deletion of these statements invalidates the certificate). Any appeal against the results specified below must be made to the BVA (for details see leaflet EPWP1).

I understand that the personal information provided as part of the scheme is only used to facilitate my request and will be retained for 7 years for accounting purposes on an electronic system. My personal information will not be shared with anyone outside the scheme

Signature of Owner/Agent _____ Date _____

This section applies only to those conditions in the breeds specified in Schedule A of the Procedure Notes current on the day of examination. Litter screening applies only to dogs up to 12 weeks of age. These results will be recorded at the KC and/or ISDS as appropriate.

(Insert condition being certified in box below)

CEA Collie eye anomaly, **CHC** Congenital hereditary cataract, **PHPV** Persistent hyperplastic primary vitreous, **MRD** Multifocal retinal dysplasia, **TRD** Total retinal dysplasia

	Microchip Number	Colour	Sex	CLINICALLY UNAFFECTED	CLINICALLY AFFECTED	CLINICALLY UNAFFECTED	CLINICALLY AFFECTED	CLINICALLY UNAFFECTED	CLINICALLY AFFECTED
1				☐	☐	☐	☐	☐	☐
2				☐	☐	☐	☐	☐	☐
3				☐	☐	☐	☐	☐	☐
4				☐	☐	☐	☐	☐	☐
5				☐	☐	☐	☐	☐	☐
6				☐	☐	☐	☐	☐	☐
7				☐	☐	☐	☐	☐	☐
8				☐	☐	☐	☐	☐	☐
9				☐	☐	☐	☐	☐	☐
10				☐	☐	☐	☐	☐	☐
11				☐	☐	☐	☐	☐	☐
12				☐	☐	☐	☐	☐	☐

"Clinically affected" signifies that there is visible evidence of the inherited eye disease(s) specified, whereas 'clinically unaffected' signifies that there is no such evidence.

Comments NO OCULAR OR OCULAR ADNEXAL ABNORMALITIES DETECTED IN ANY OF THE PUPPIES ☐

DNA sample taken on this date: Yes ☐ No ☐
I confirm that the scanned microchip number matches the number on the certificate ☐
Information for owners/Appeals leaflet (EPWP1) issued ☐

I have today examined the above animal(s) under the BVA/KC/ISDS Eye Scheme with the results as shown

Signature of Panellist _____ Name _____ Date _____

Panellist's ref no. _____ Distribution: White – owner Yellow – BVA Pink – retained by panellist

BVA telephone 020 7908 6380 BVA 09/18

COLLIE EYE ANOMALY
BORDER COLLIE

- Present from birth and non-progressive
- Usually bilateral and asymmetrical with no obvious effect on vision
- Definitive lesion is choroidal hypoplasia – a pale patch lateral to the optic disc
- Colobomatous defects of the optic disc or adjacent areas may also be a feature
- Complications (retinal detachment, intraocular haemorrhage, blindness) are rare in Border Collies
- Litter screening of puppies can take place from 5 weeks of age and up to 12 weeks of age; ideal age for litter screening is 5-8 weeks of age
- In Border Collies of more than 3 months of age so-called 'Go Normals' can make diagnosis more difficult as minor choroidal hypoplasia can be obscured by postnatal pigmentation
- A recent request (August 2024) from Prof Gus Aguirre asks ACVO Diplomates to grade CEA disease severity to identify genetic markers

COLLIE EYE ANOMALY (CEA)

Right eye 5 week old normal puppy

Right eye 5 week old CEA affected puppy with choroidal hypoplasia (pale patch) lateral to the optic disc

SUMMARY
BORDER COLLIE AND LITTER SCREENING

Congenital and neonatal problem (CEA)

- Examination of puppies while they are still part of a litter (litter screening) is best carried out at 5-8 weeks and provides the most reliable means of clinical diagnosis – this provides information on congenital and neonatal eye disease for the **whole** litter;
- Dogs can be certified under the Eye Scheme at any age, but CEA, as yet, is the **only** Border Collie inherited eye problem that can be clinically identified in puppies;
- CEA is a **non-progressive** inherited condition that is present from birth, but very mild lesions may be obscured by post-natal development;
- These so-called “Go Normals” appear phenotypically normal, but they are genotypically affected;
- DNA testing can be used to distinguish CEA affected, CEA carriers and normal animals;
- If there is any history of CEA in the line then litter screening **and** DNA testing are advised as this enables a sensible breeding strategy to be adopted.

EYE EXAMINATION CERTIFICATE - BORDER COLLIE

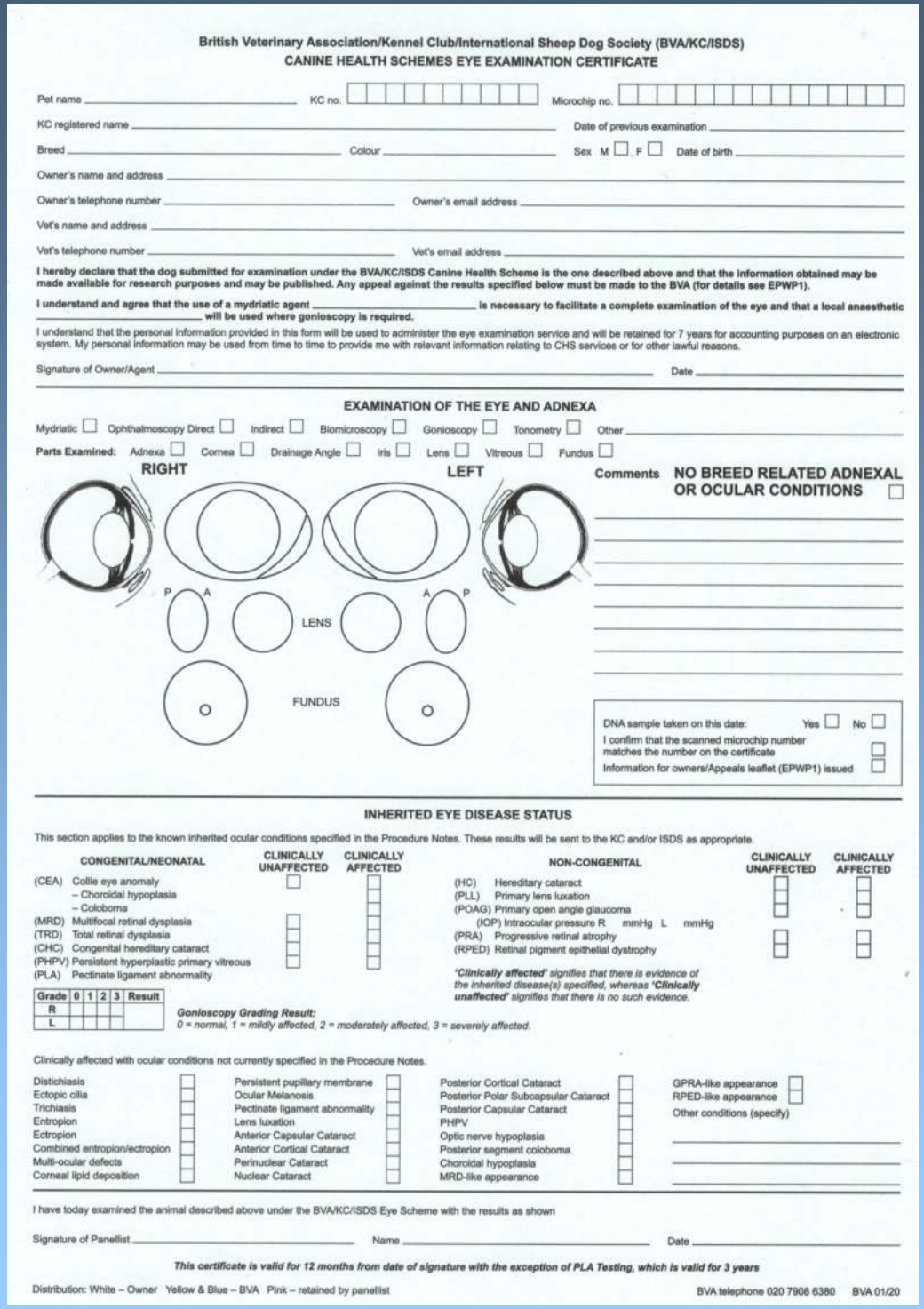
Conditions certified

Collie Eye Anomaly (CEA)

Goniodysgenesis (G)

Primary Lens Luxation (PLL)

Retinal Pigment Epithelial Dystrophy (RPED)



British Veterinary Association/Kennel Club/International Sheep Dog Society (BVA/KC/ISDS)
CANINE HEALTH SCHEMES EYE EXAMINATION CERTIFICATE

Pet name _____ KC no. _____ Microchip no. _____

KC registered name _____ Date of previous examination _____

Breed _____ Colour _____ Sex M ☐ F ☐ Date of birth _____

Owner's name and address _____

Owner's telephone number _____ Owner's email address _____

Vet's name and address _____

Vet's telephone number _____ Vet's email address _____

I hereby declare that the dog submitted for examination under the BVA/KC/ISDS Canine Health Scheme is the one described above and that the information obtained may be made available for research purposes and may be published. Any appeal against the results specified below must be made to the BVA (for details see EPWP1).

I understand and agree that the use of a mydriatic agent _____ is necessary to facilitate a complete examination of the eye and that a local anaesthetic _____ will be used where gonioscopy is required.

I understand that the personal information provided in this form will be used to administer the eye examination service and will be retained for 7 years for accounting purposes on an electronic system. My personal information may be used from time to time to provide me with relevant information relating to CHS services or for other lawful reasons.

Signature of Owner/Agent _____ Date _____

EXAMINATION OF THE EYE AND ADNEXA

Mydriatic ☐ Ophthalmoscopy Direct ☐ Indirect ☐ Biomicroscopy ☐ Gonioscopy ☐ Tonometry ☐ Other _____

Parts Examined: Adnexa ☐ Cornea ☐ Drainage Angle ☐ Iris ☐ Lens ☐ Vitreous ☐ Fundus ☐

RIGHT LEFT

P A LENS A P

FUNDUS

Comments **NO BREED RELATED ADNEXAL OR OCULAR CONDITIONS** ☐

DNA sample taken on this date: Yes ☐ No ☐

I confirm that the scanned microchip number matches the number on the certificate ☐

Information for owners/Appeals leaflet (EPWP1) issued ☐

INHERITED EYE DISEASE STATUS

This section applies to the known inherited ocular conditions specified in the Procedure Notes. These results will be sent to the KC and/or ISDS as appropriate.

CONGENITAL/NEONATAL	CLINICALLY UNAFFECTED	CLINICALLY AFFECTED
(CEA) Collie eye anomaly – Choroidal hypoplasia – Coloboma	☐	☐
(MRD) Multifocal retinal dysplasia	☐	☐
(TRD) Total retinal dysplasia	☐	☐
(CHC) Congenital hereditary cataract	☐	☐
(PHPV) Persistent hyperplastic primary vitreous	☐	☐
(PLA) Pectinate ligament abnormality	☐	☐

NON-CONGENITAL	CLINICALLY UNAFFECTED	CLINICALLY AFFECTED
(HC) Hereditary cataract	☐	☐
(PLL) Primary lens luxation	☐	☐
(POAG) Primary open angle glaucoma	☐	☐
(IOP) Intraocular pressure R mmHg L mmHg		
(PRA) Progressive retinal atrophy	☐	☐
(RPED) Retinal pigment epithelial dystrophy	☐	☐

***'Clinically affected'** signifies that there is evidence of the inherited disease(s) specified, whereas **'Clinically unaffected'** signifies that there is no such evidence.*

Grade	0	1	2	3	Result
R					
L					

Gonioscopy Grading Result:
0 = normal, 1 = mildly affected, 2 = moderately affected, 3 = severely affected.

Clinically affected with ocular conditions not currently specified in the Procedure Notes.

Distichiasis ☐	Persistent pupillary membrane ☐	Posterior Cortical Cataract ☐	GPRA-like appearance ☐
Ectopic cilia ☐	Ocular Melanosis ☐	Posterior Polar Subcapsular Cataract ☐	RPED-like appearance ☐
Trichiasis ☐	Pectinate ligament abnormality ☐	Posterior Capsular Cataract ☐	Other conditions (specify)
Entropion ☐	Lens luxation ☐	PHPV ☐	
Ectropion ☐	Anterior Capsular Cataract ☐	Optic nerve hypoplasia ☐	
Combined entropion/ectropion ☐	Anterior Cortical Cataract ☐	Posterior segment coloboma ☐	
Multi-ocular defects ☐	Perinuclear Cataract ☐	Choroidal hypoplasia ☐	
Corneal lipid deposition ☐	Nuclear Cataract ☐	MRD-like appearance ☐	

I have today examined the animal described above under the BVA/KC/ISDS Eye Scheme with the results as shown

Signature of Panellist _____ Name _____ Date _____

This certificate is valid for 12 months from date of signature with the exception of PLA Testing, which is valid for 3 years

Distribution: White – Owner Yellow & Blue – BVA Pink – retained by panellist

BVA telephone 020 7908 6380 BVA 01/20

EYE TESTING IN ADULTS

BORDER COLLIE

Problems that may be recognised in adults by clinical examination - CEA, RPED, PLL and G (goniodysgenesis)

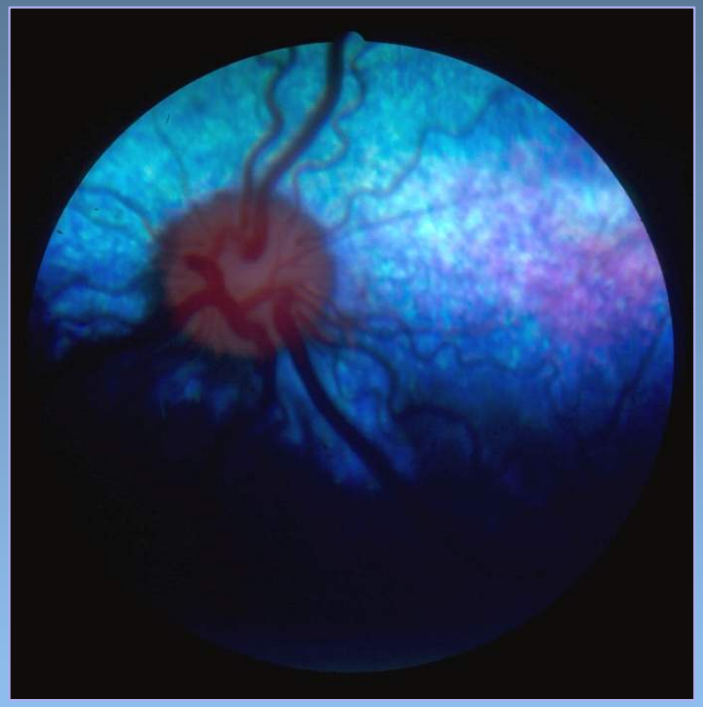
For Border Collies the minimal approach is examination and certification prior to breeding, with a further examination when the dog is over eight years of age;

Testing prior to breeding and repeated at around 5 years and 8 years might be the most practical approach as this would include routine clinical examination and gonioscopy

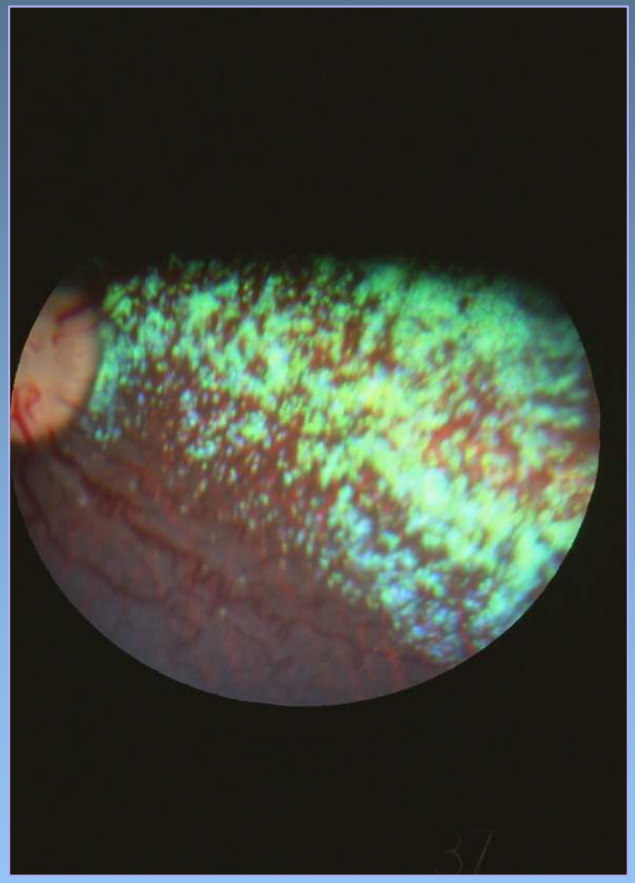
Popular sires should undergo annual routine examination – they can be responsible for more than 200 puppies a year, so unrecognised hereditary disease is highly damaging to the breed

COLLIE EYE ANOMALY

‘Go Normal’



Left eye 5 week old Border Collie puppy – small pale patch of choroidal hypoplasia lateral to the optic disc



Left eye Border Collie adult – choroidal hypoplasia is suspected, but not obvious

BVA/KC/ISDS EYE SCHEME

Eye Examination Certificate – conditions currently certified in the Border Collie

Collie Eye Anomaly (CEA) - ideally screened for as puppies at 5-8 weeks, so as to avoid the confusion of the 'Go Normal'

Goniodysgenesis (G) and Pectinate Ligament Abnormality (PLA) - abnormal drainage angle

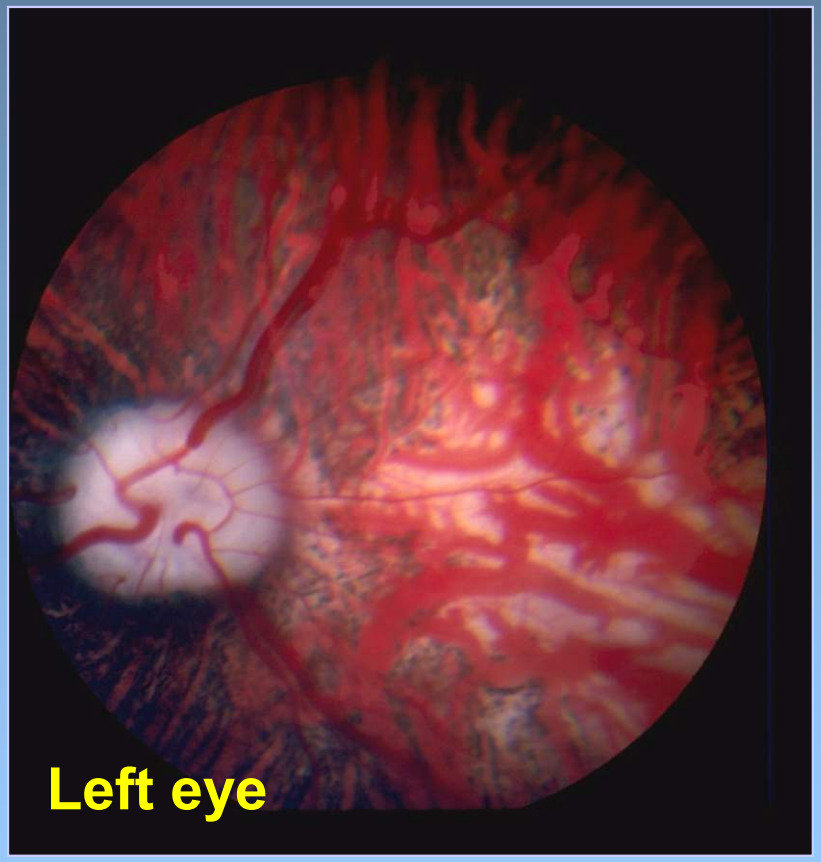
Can check drainage angle using gonioscopy from 5-6 months of age onwards - if glaucoma develops the age of onset of glaucoma varies

Primary Lens Luxation (PLL) - 3-7 years

Retinal Pigment Epithelial Dystrophy (RPED) - from 12-14 months onwards in adults

COLLIE EYE ANOMALY

(ADULT BORDER COLLIES)



Choroidal hypoplasia

COLLIE EYE ANOMALY

(ADULT BORDER COLLIES)

CEA - Choroidal hypoplasia and large colobomatous defects

COLLIE EYE ANOMALY

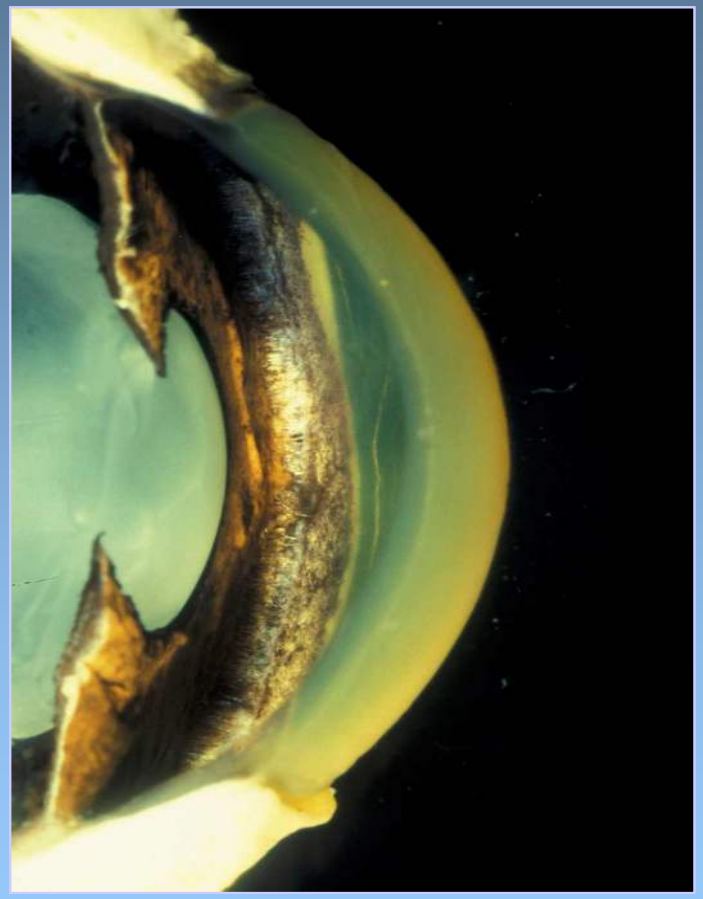
(COMPLICATIONS OF CEA IN SHETLAND SHEEPDOG AND ROUGH COLLIE)

Intraocular haemorrhage
Shetland Sheepdog

Retinal detachment
Rough Collie

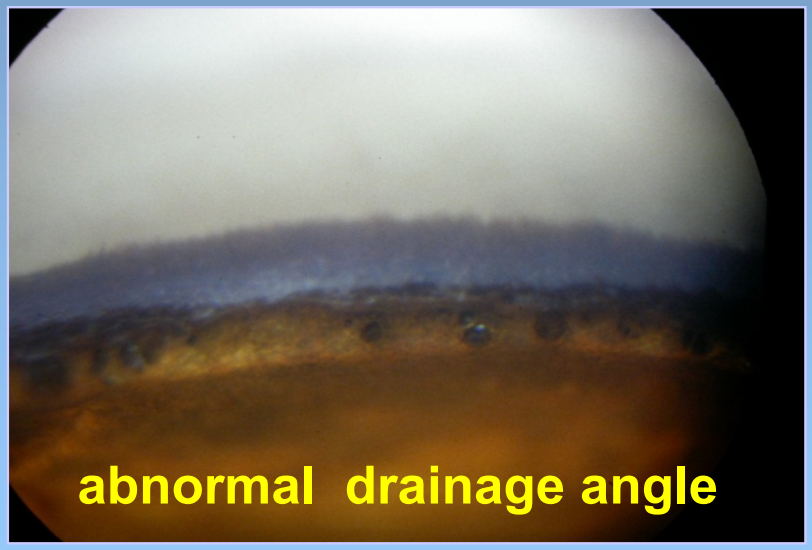
Primary Closed Angle Glaucoma (PCAG)

Pectinate Ligament Abnormality (PLA) and Goniodysgenesis (G)



Acknowledgement JRB Mould

normal drainage angle

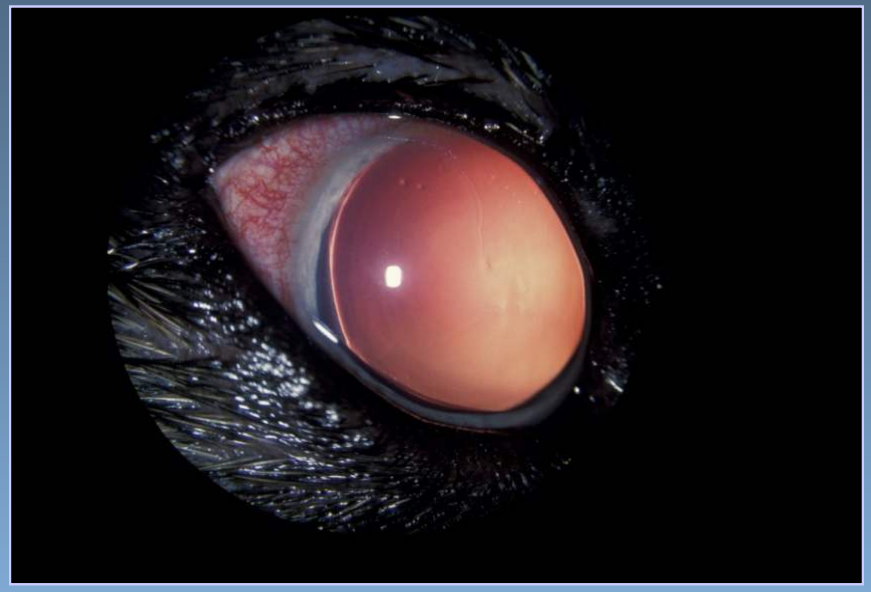


abnormal drainage angle

PECTINATE LIGAMENT ABNORMALITY (PLA) AND GONIODYSGENESIS (G)
Border Collie

- Abnormalities: pectinate ligament abnormality (PLA) with or without narrowing of the drainage angle
- An abnormal drainage angle is termed goniodysgenesis
- Assessment of the angle, graded from 0-3, is confirmed by gonioscopy at five to six months of age
- Goniodysgenesis is a risk factor for subsequent glaucoma
- Acute glaucoma (illustrated) is painful and blinding

PRIMARY LENS LUXATION (PLL)
Border Collie



In this dog the intraocular pressure is raised to a level sufficient to damage the eye and vision (glaucoma)

Clinical diagnosis is usually made from 5-6 years of age onwards

Clinical signs include ocular redness, a widely dilated non-responsive pupil and an eye that is painful and blind once glaucoma develops

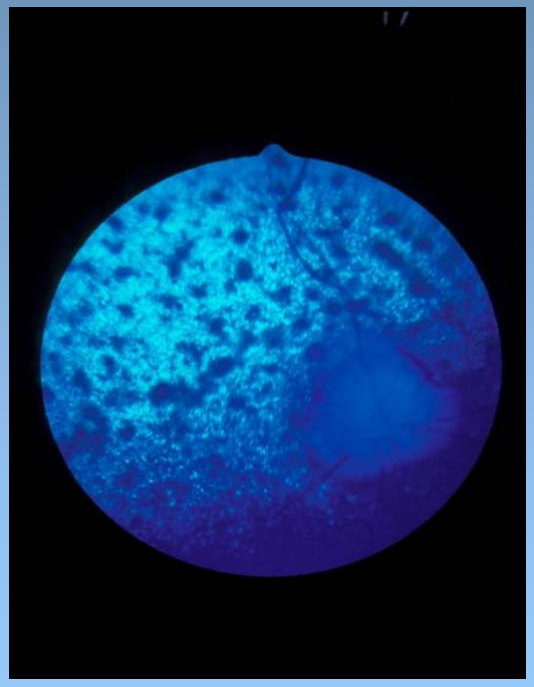
The edge of the displaced (luxated) lens is highlighted by the focal light source in this image

RETINAL PIGMENT EPITHELIAL DYSTROPHY (RPED)

- Originally named Central Progressive Retinal Atrophy (CPRA), but primarily involves the retinal pigment epithelium (RPE) and not the photoreceptors, so RPED is a more appropriate description
- May be clinically apparent, especially in the central tapetal fundus, from 12-14 months of age
- Initial clinical appearance is of multiple small greyish-brown focal lesions in the RPE which coalesce to produce a cobweb like appearance with background hyperreflectivity
- Subsequent local degeneration of photoreceptors overlying the abnormal hypertrophied cells of the RPE progress to retinal degeneration
- Bilateral, painless and progressive, the peripheral retina is spared initially and progression may not result in total blindness
- Later changes include narrowing (attenuation) of the retinal vessels and the end stage retinal degeneration is similar in appearance to that of other retinopathies

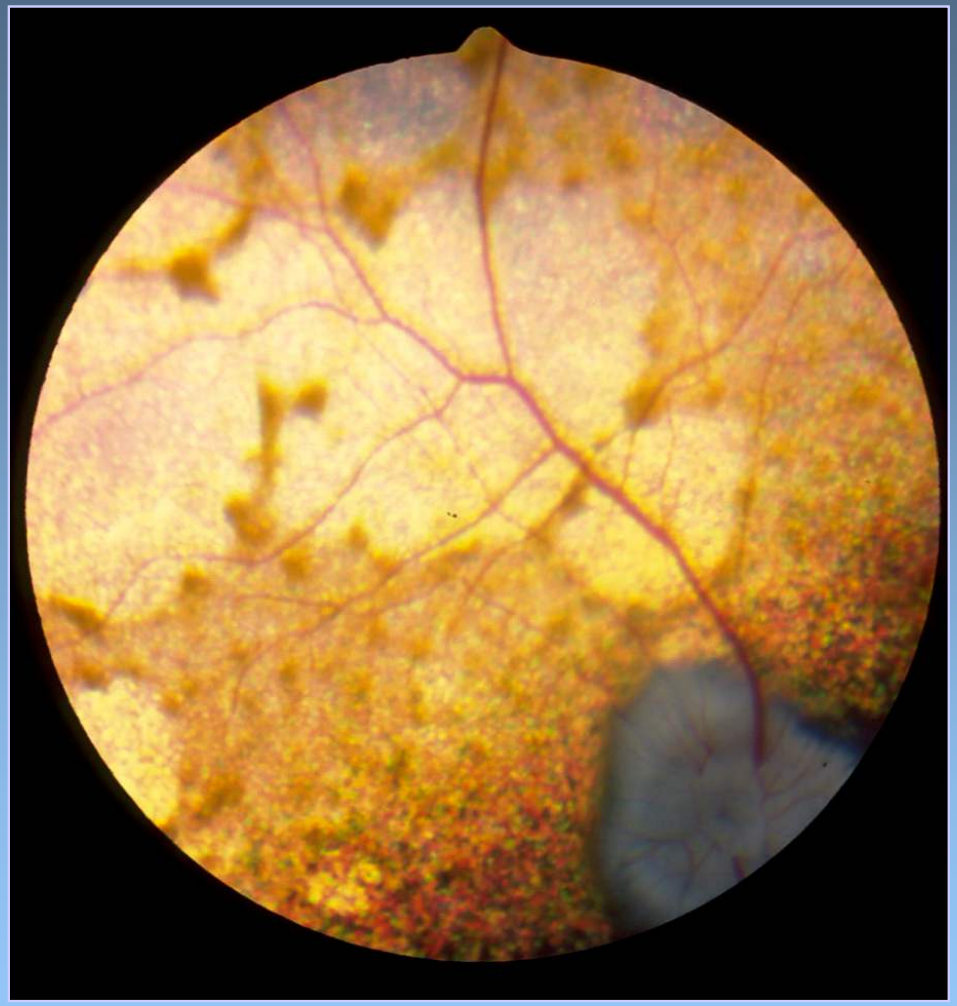
RETINAL PIGMENT EPITHELIAL DYSTROPHY

- Multiple focal pigment spots (lipopigment accumulation)
- Hyperreflectivity
- Attenuated retinal vessels



Similar retinal changes have been demonstrated in Cocker Spaniels on a Vitamin E deficient diet

RETINAL PIGMENT EPITHELIAL DYSTROPHY



RPED (Cocker Spaniel)

End stage RPED Panretinal degeneration and optic atrophy

BVA/KC/ISDS EYE SCHEME
BORDER COLLIE

	TOTAL ADULTS	TOTAL LITTERS	ADULT ISDS	TOTAL AFFECTED CEA	RPED	PLL	G PLA 0	G PLA 1	G PLA 2	G PLA 3
2023	246	54	53	0	0	0	80	9	1	6
2022	249	37	64	0	0	2	114	60	1	0
2021	325	35	132	0	0	1	97	17	3	1
2020	190	36	92	0	0	0	37	7	1	1
2019	419	94	246	1	0	0	24	6	3	0
2018	460	100	294	1	0	0	45	10	1	0
2017	781	121	No data	0	0	0	60	19	2	0
2016	891	163	572	2	0	0				
2015	826	161	539	0	0	0				
2014	798	128	No data	2	0	0				
2013	799	92	527	5	0	0				
2012	1517	112	1298	3	1	0				
2011	1549	106	1231	14	0	0				
2010	1701	134	1382	11	1	0				
2009	1961	No breakdown	1585	13	1	1				
2008	1936	No breakdown	1714	7	0	0				
2007	1410	No breakdown	No data	16	0	0				
2006	1436	No breakdown	1173	18	1	0				

BORDER COLLIE SUMMARY

Eye testing and DNA testing are complementary not interchangeable

Examination of the eye is the best way of obtaining an overview of eye problems in the breed as a whole and the ocular health status of individual Border Collies

DNA testing is the best way of obtaining an overview of CEA prevalence and detecting the CEA status of individual Border Collies.

Identification of mutations and development of DNA tests for other ocular problems by the Canine Genetics Centre has been highly successful

The Canine Genetics Centre focuses its research on diseases that are painful, blinding, require surgical or medical intervention or otherwise reduce the quality or length of life of affected dogs – an excellent approach

https://www.canine-genetics.org.uk/about/about-the-cgc/

Eye Health in Border Collies

With grateful thanks:
Numerous Border Collies and their owners - including my dogs
BVA/KC/ISDS Eye Panellists past and present
Dr Cathryn Mellersh and her team at the Canine Genetics Centre
In loving memory:
Dr Keith Barnett, our inspirational friend and mentor