HED SESSION 2024 - KAHOOT

In cooperation with the Dutch Panel

Prof. Dr. Frans Stades Dr. Roswitha van de Sandt

This session and the information on how to correctly issue the ECVO certificate is based on the ECVO Manual 2023

Comments to **Chapter 8 Vet Advice:**

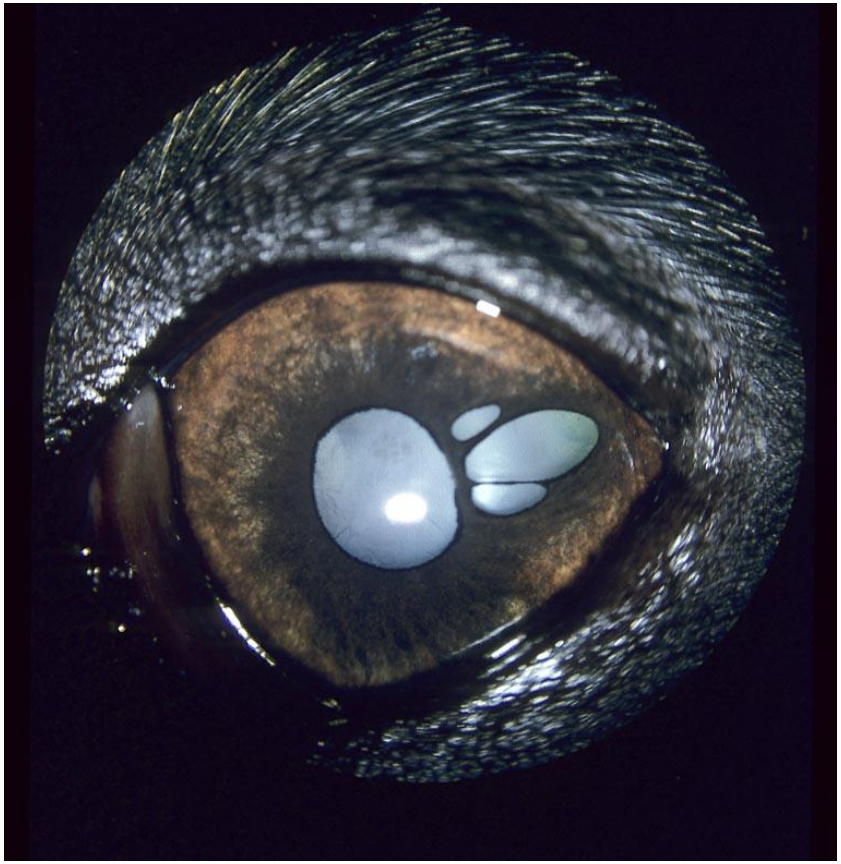
- In Chapter 8, we choose the term « Veterinary Ophthalmologists' **advice** relating to HED control » and **intentionally avoid** the words "pass", "fail", "certifiable" and "registerable". The **ECVO does not prescribe breeding rules**, nor does it serve as a registry organization.

- **Breed clubs and registry** organizations prescribe breeding rules.

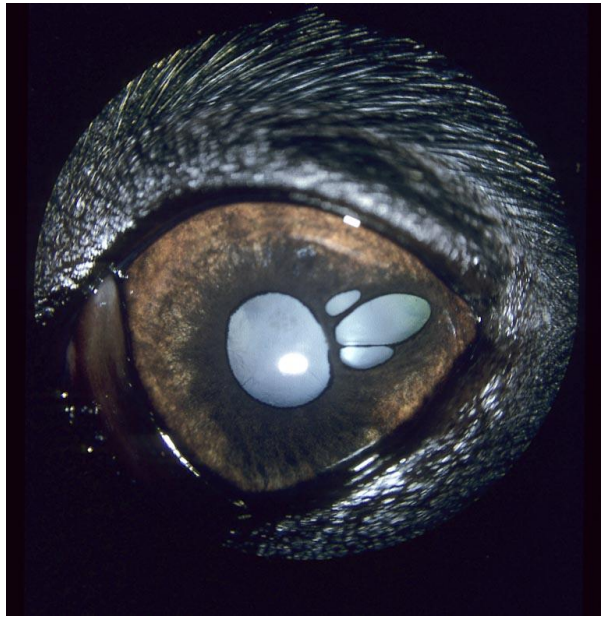
HED SESSION – Kahoot!

Case 1

English Cocker Spaniel, 2 years, m, bilateral slide: FS



English Cocker Spaniel, 2 years, m, bilateral slide: FS



PSENP= Posterior segment examination not possible

Comm=descriptive comments

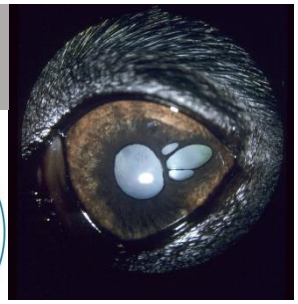
▲ 15. Cataract (later onset)- mature, 7&18 PSENP; Comm: iris atrophy

◆ 15: Cataract (later onset) cortical + nuclear, 7. Other: iris hypoplasia

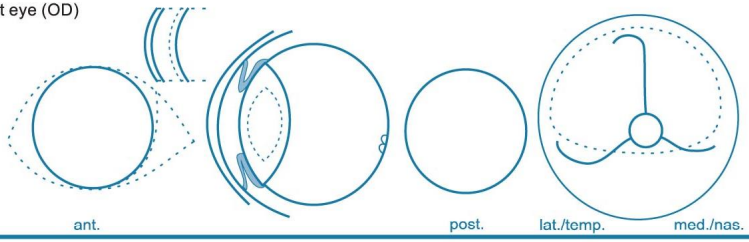
● 15. Cataract (later onset)-mature, 7. other: uvea hypoplasia + PSENP

■ 15. Cataract (later onset) cortical + nuclear, 7. Iris hypoplasia, 7&18 PSENP; 7 severe

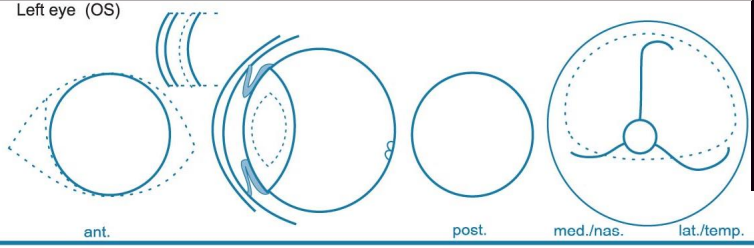
Eng C Spaniel,2y, (bi)lateral finding



Right eye (OD)



Left eye (OS)



Descriptive comments: .....

.....

.....

Eye disease no. 7. Iris hypoplasia ..... ☒ severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	☒	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☐	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☒	☐	☐
4. Retinal Dysplasia (RD)	☐	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☐
6. Collie Eye Anomaly (CEA)	☐	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other: Iris hypoplasia Post.seg.exam not possible	☐	☐	☒
8. IridoCorneal Angle Abnormality. (ICAA)	☐	☐	☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	☒	☐	☐
12. Ectropion / Macroblepharon	☒	☐	☐
13. Distichiasis / Ectopic cilia	☒	☐	☐
14. Corneal dystrophy	☒	☐	☐
15. Cataract (later onset)	☐	☐	☒ ☒ cortical ☐ post. pol. ☒ nuclear ☐ other lens opacity
16. Lens luxation (primary)	☒	☐	☐
17. Retinal degeneration (PRA)	☐	☐	☐
18. Other: Posterior segment exam not possible	☐	☐	☒

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
"Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

HED Manual Chapter 5 Definitions:

Hypoplasia iris: KP-HED; characterized by congenital **thinning and/or absence** of iris (sphincter) tissue or **colobomatous** defects due to failure in closure of the optic fissure. It may be a separate disorder or associated with other ocular malformations. See and use iris hypoplasia.

HED Manual Chapter 5 Definitions:

Cataract: is an opacity (generally whitish) in different shapes and sizes in the lens nucleus, and/or cortex and/or capsule; it is resulting from pathologic changes in lens protein composition or disruption of lens fiber arrangement.

Clinical significance: The clinical significance is influenced by the extent, density and location of the opacity, as well as its potential to progress, which leads to scattering of incident light, reduced illumination, reduced contrast sensitivity, increased glare, degraded color vision, and loss of visual acuity and visual function.

Classification according to aetiology:

- **Primary cataracts: all bilateral or unilateral cataracts and especially cortical cataracts are KP- HEDs (except secondary cataracts)**

Iris hypoplasia

Congenital, uni- or bilateral thinning and/or absence of iris (sphincter) tissue or colobomatous defects due to failure in closure of the optic fissure.

At “7. Other”: “**Iris hypoplasia**” is written (online: is used), and the box “affected” is ticked.

Only if uni- or bilateral iris tissue is missing (full thickness) or failed to develop (developmentally colobomatous) also the box “severe” is to be ticked in the comment area

Juvenile and adult cataracts: cataracts developed at older age (after 12th weeks of age) are ticked "affected" at **"15. Cataract (later onset)"** and tick further specification as given below.

In a **total/mature cataract**, in case of cataract (later onset): tick at 15. Cataract (later onset)" the boxes affected and the specifying boxes **"cortical" and "nuclear"**.

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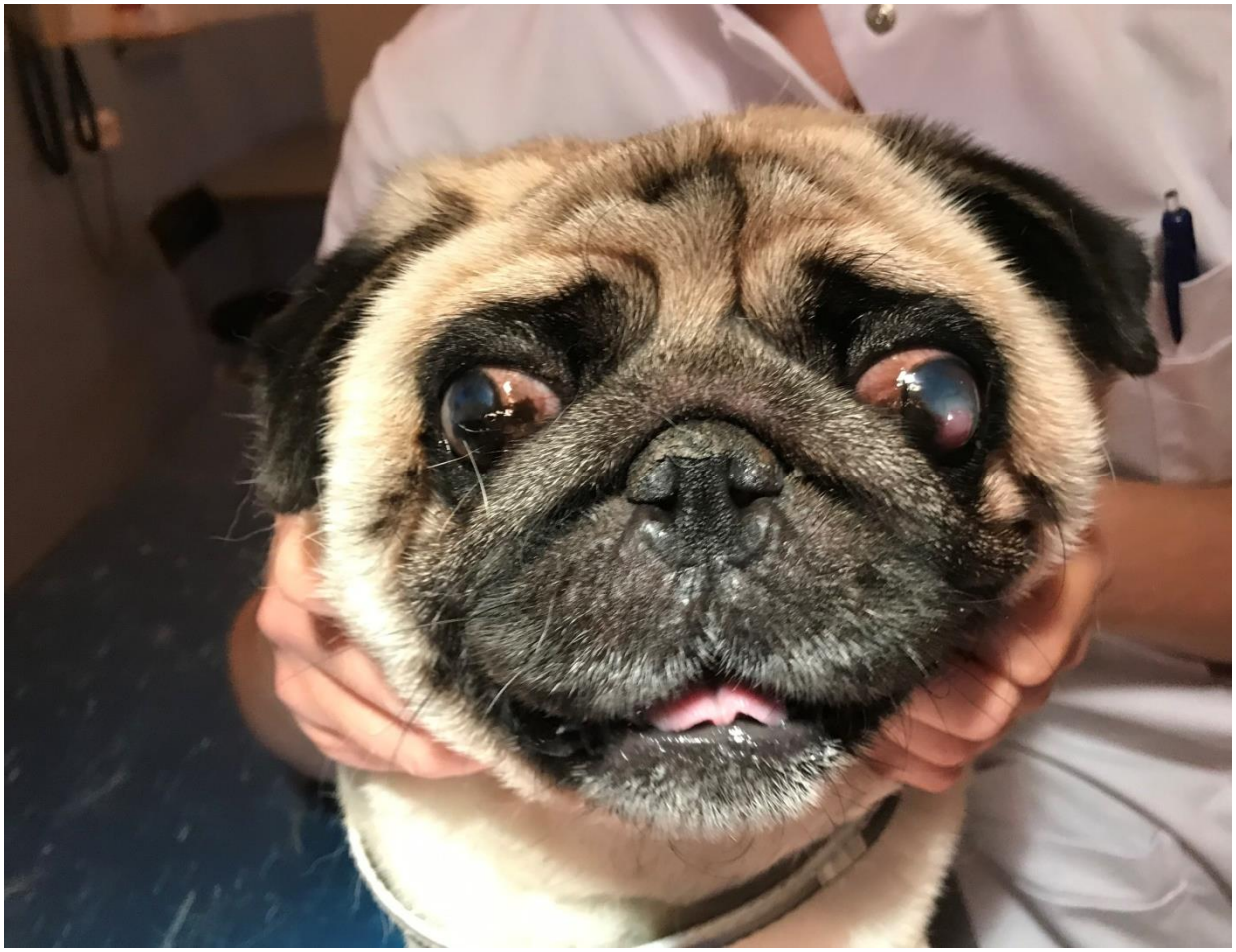
Case 2

Pug, 7 y OU Slide: Djajadiningrat Utrecht University clinic



OU

Pug, 7 y OU Slide: Djajadiningrat Utrecht University clinic

ESO= exophthalmus due to shallow orbit

▲ 7. Other: Exophthalmos due to shallow orbit (ESO), 12. Ent/Tri, 18. Ocular melanosis

◆ 7. Other: ESO, 12. Ect/macrobl; 7. Severe Comm: Corneal scar

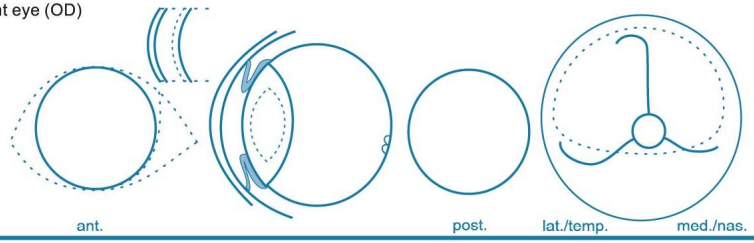
● 7. Other: ESO, 11. Ent/Tri, 12. Ect/ Macrobl; 7, 11, 12 severe

■ 7. Other: ESO, 11. Ent/Tri, 12. Ect/ Macrobl; 11, 12 severe

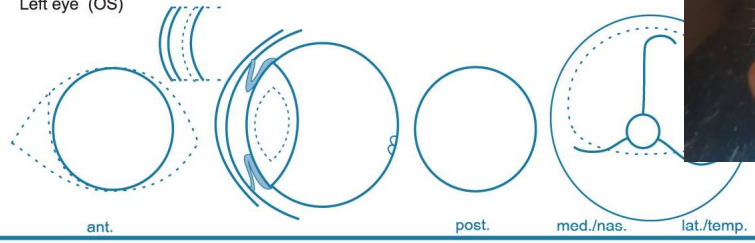
ECVO

Pug, 7 y OU Slide: Djajadiningrat Utrecht University clinic

Right eye (OD)



Left eye (OS)



Descriptive comments: 11. Entropion nasal
11. Trichiasis nasal/nasal fold

Eye disease no. 7,11,12 ☒ severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe
ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	☒	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☒	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☒	☐	☐
4. Retinal Dysplasia (RD)	☒	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☒	☐	☐
6. Collie Eye Anomaly (CEA)	☒	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other: Exophthalmos due to shallow orbit	☐	☐	☒
8. IridoCorneal Angle Abnormality. (ICAA)	☐	☐	☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	☐	☐	☒
12. Ectropion / Macroblepharon	☐	☐	☒
13. Distichiasis / Ectopic cilia	☒	☐	☐
14. Corneal dystrophy	☒	☐	☐
15. Cataract (later onset)	☒	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	☒	☐	☐
17. Retinal degeneration (PRA)	☒	☐	☐
18. Other:	☒	☐	☐

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
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"Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

HED Manual Chapter 5 Definitions:

Exophthalmos due to shallow orbit:

KP-HED in some brachycephalic breeds;

As part of the facial and skull bone deformities, the bony cavity is not deep enough to accommodate a normal sized globe. In combination with macroblepharon this leads to an anatomically **pathological exposure of the globe**, **recognizable by the visible sclera when the eye is directed straight ahead**

HED Manual Chapter 5 Definitions:

Macroblepharon:

KP-HED; an **exceptionally large palpebral fissure**. Macroblepharon in conjunction with laxity of the lateral canthal structures may lead to lower lid ectropion in combination with lateral and medial entropion and upper lid entropion and trichiasis. This may in **severe cases** result in **diamond-shaped eyes.** Either of these conditions may lead to conditions associated with **corneal exposure.**

HED Manual Chapter 5 Definitions:

Trichiasis:

KP-HED or acquired abnormality of deviated hairs on a normal place around the lid fissure, irritating the conjunctiva, the free lid margin of the opposite lid and/or the conjunctiva and/or the globe. It is predominantly due to facial folds or due to misalignment of the eyelids.

Exophthalmos due to shallow orbit

is usually seen in combination with macroblepharon. If the sclera is visible in two or three quadrants or all around in the straight position of the globe, with or without strabismus divergens (without prior pathology) at:

"7. Other": "Exophthalmos due to shallow orbit" is written (online: is used) and the box "affected" is ticked.

Only if the **sclera is visible all around** (with a normal-sized globe), also the box "**severe**" in the comments area is ticked.

In case of macroblepharon also tick at

12. Ectropion/ Macroblepharon

In case of additional Trichiasis also tick at

11. Entropion/Trichiasis

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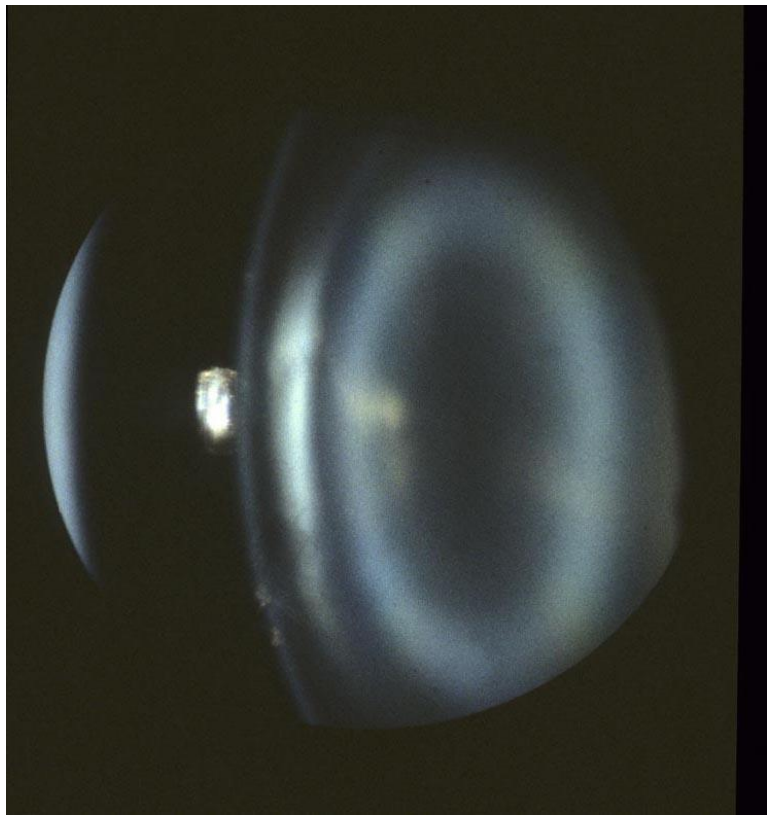
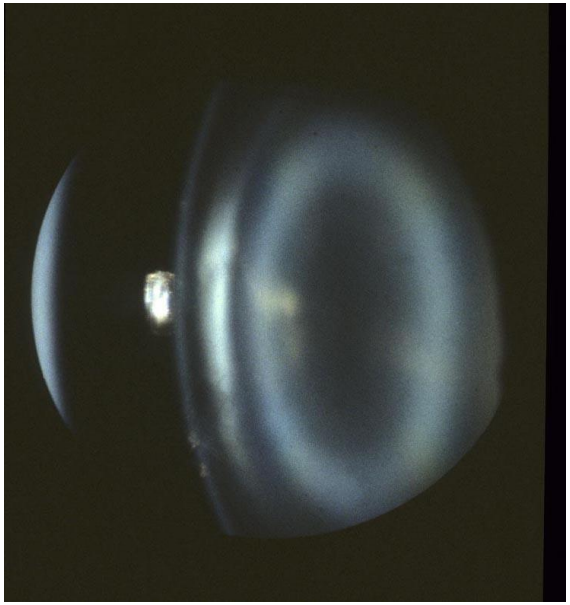
Case 3

Dachshund 8 y, bilateral , forget reflex on cornea slide: FS



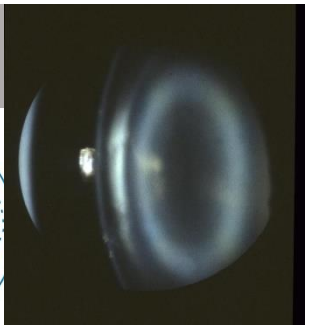
OS

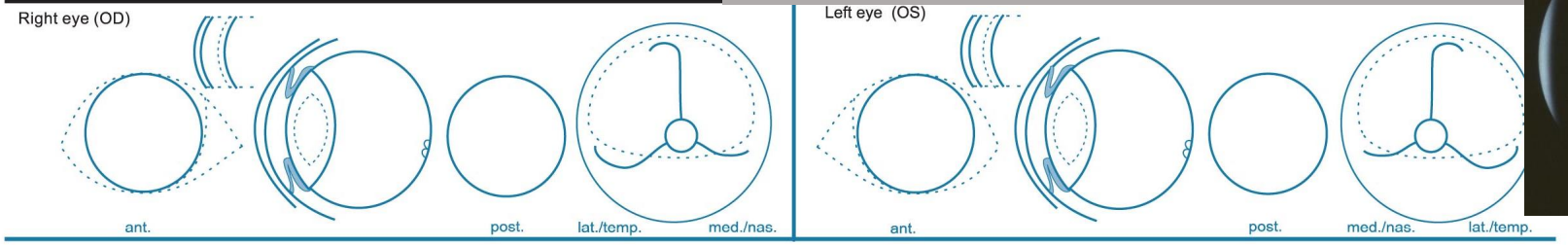
Dachshund 8 y, bilateral slide: FS forget reflex on cornea



▲ 15. Cataract (later onset): juvenile-nuclear	◆ 15: Cataract(later onset)- other lens opacity - nuclear ring
● 15. Cataract (later onset)- mature nuclear	■ Nuclear sclerosis

Dachshund 8 y, bilateral , forget reflex on cornea
slide: FS





Descriptive comments: .....

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Eye disease no. ..... ☐ severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	X		☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	X		☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	X		
4. Retinal Dysplasia (RD)	X		☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	X		
6. Collie Eye Anomaly (CEA)	X		☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	X		
8. IridoCorneal Angle Abnormality. (ICAA)			☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	X		
12. Ectropion / Macroblepharon	X		
13. Distichiasis / Ectopic cilia	X		
14. Corneal dystrophy	X		
15. Cataract (later onset)	X		☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	X		
17. Retinal degeneration (PRA)	X		
18. Other:	X		

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

Cataracts Classifications:

- **Refraction discontinuity zones**: fine (light-grey) regular circular/bend lines due to different refractive indices of the fibers of the embryonic, fetal, juvenile

- **Nuclear sclerosis**: is a translucent optical turbidity of the lens nucleus due to aging; appearance: blue-gray shade of the central area of the lens; translucent: the fundus can be viewed without restriction using ophthalmoscopy;

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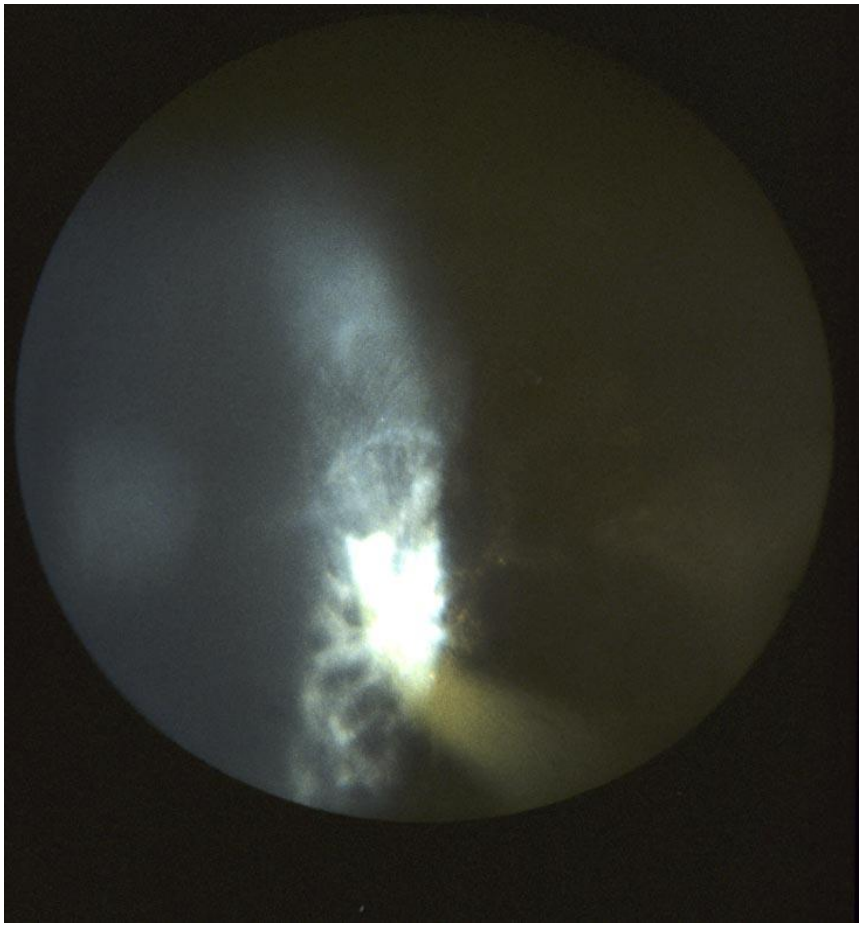
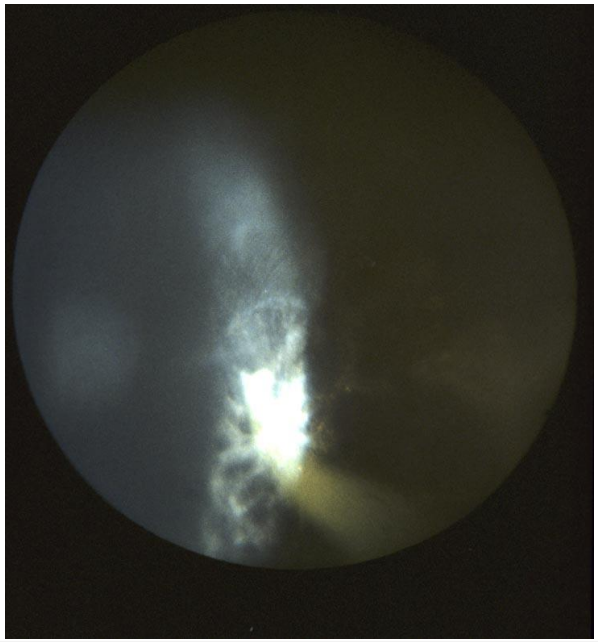
Case 4

Sussex Spaniel, 3 y, m, bilateral, slitlamp photo of the posterior lens capsule slide: FS



OS

Sussex Spaniel, 3 y, m, bilateral, slitlamp photo posterior lens capsule slide: FS



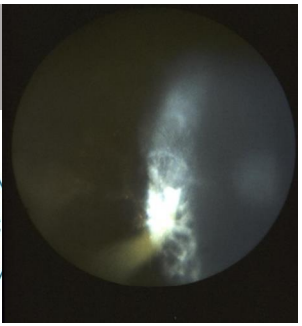
▲ 3. Cataract-(congenital) – post pol.

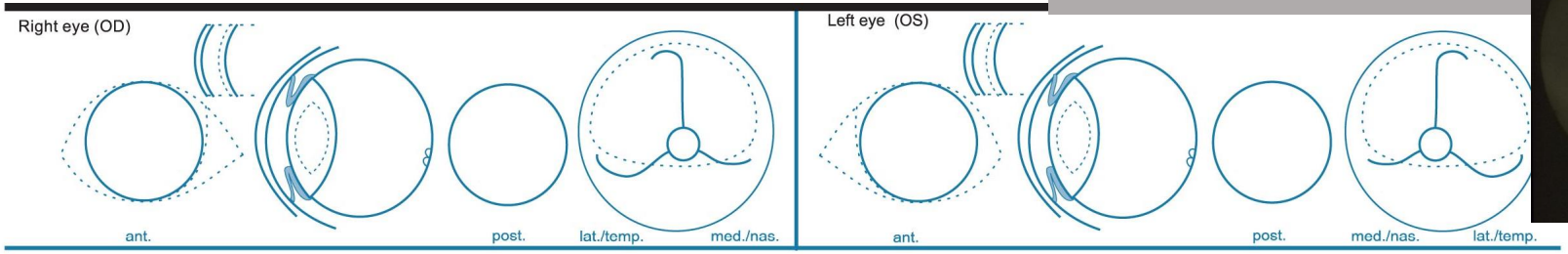
◆ 3. Cataract (congenital) + 7. Persistent hyaloid artery

● Comm: Persistent hyaloid artery

■ 3. Cataract (congenital) + 7. Persistent hyaloid artery; 7. severe

Sussex Spaniel, 3 y, m,
bilateral slide: FS





Descriptive comments: .....

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Eye disease no. 7. PHA ..... X severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	X		☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	X		☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)			X
4. Retinal Dysplasia (RD)	X		☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	X		
6. Collie Eye Anomaly (CEA)	X		☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other: Persistent hyaloid artery			X
8. IridoCorneal Angle Abnormality. (ICAA)			☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	X		
12. Ectropion / Macroblepharon	X		
13. Distichiasis / Ectopic cilia	X		
14. Corneal dystrophy	X		
15. Cataract (later onset)	X		☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	X		
17. Retinal degeneration (PRA)	X		
18. Other:	X		

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“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

Persistent hyaloid artery (PHA):

KP-HED; congenital defect resulting from abnormalities in the development and regression of the hyaloid artery. The blood vessel remnant can be present in the vitreous as a small patent vascular strand (PHA) or as a non-vascular strand that appears grey-white (persistent hyaloid remnant).

Persistent hyaloid artery (PHA)

If the PHA is **distinctly visible** by the **naked eye** (thus not only by microscope) in retro illumination, at number "7. Other": "Persistent hyaloid artery" (PHA) is ticked.

Only if there is a Mittendorf's dot with signs of capsular cataract that goes **beyond** the insertion of the PHA and/or a Bergmeister papilla with a patent vascular or non-vascular fibrous strand in between them, at number "7". Other: "Persistent hyaloid artery" is used (on paper: written) and the box "affected" plus the box: "**severe**" in the comment area are ticked.

Congenital cataracts

If cataracts are observed in the period between birth and the 12th week of age the entity is ticked “affected” at “3. Cataract (congenital)”;

if diagnosed later in life but there is distinct indication the cataract is congenital in origin (e. g. in microphthalmos, in the lens cortex adjacent to PPM, or PHA) the entity is ticked “affected” at “3. Cataract (congenital)”, except in PHTVL/PHPV, where the cataract is part of the entity.

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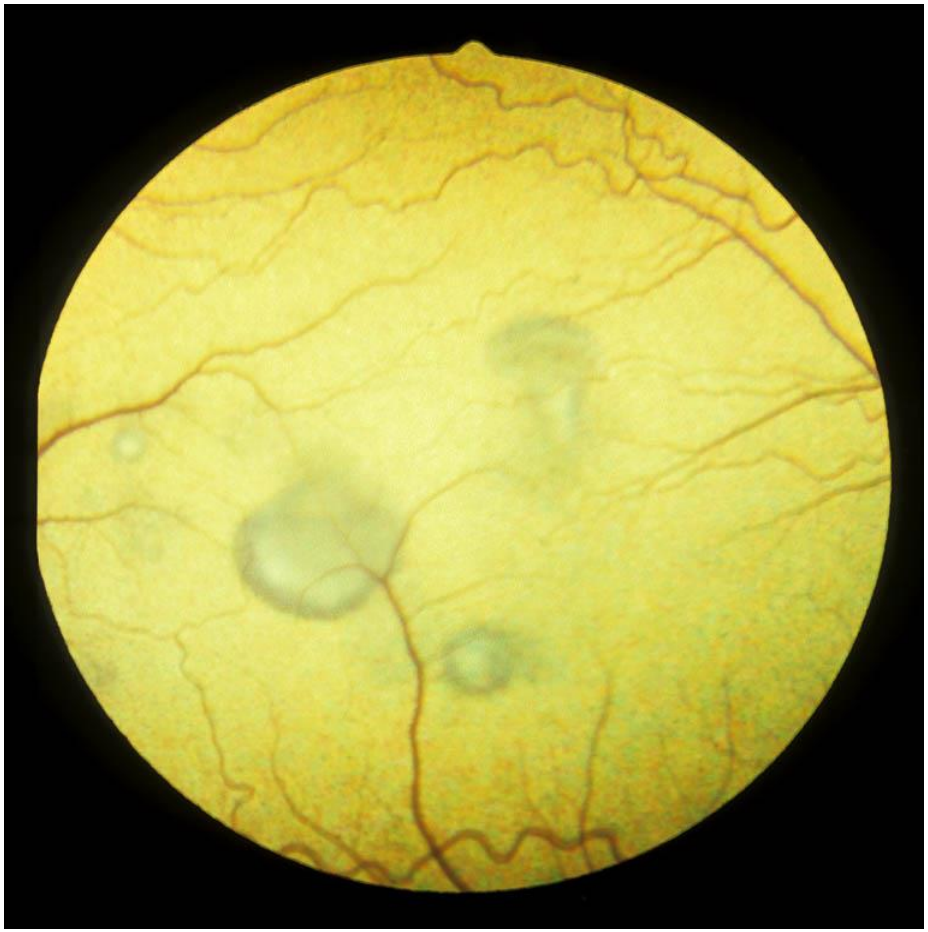
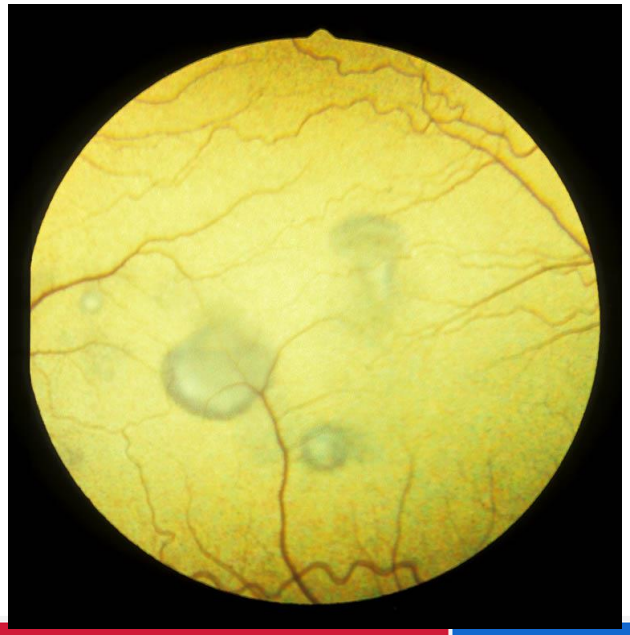
Case 5

Lapponian Shepherd 2y, OS Slide: FS



OS

Lapponian Shepherd 2y, OS Slide: FS



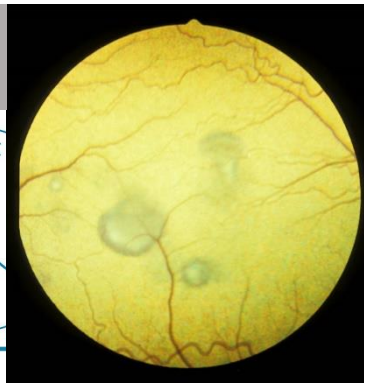
▲ 18. Other: Retinopathy Canine multifocal (CMR)

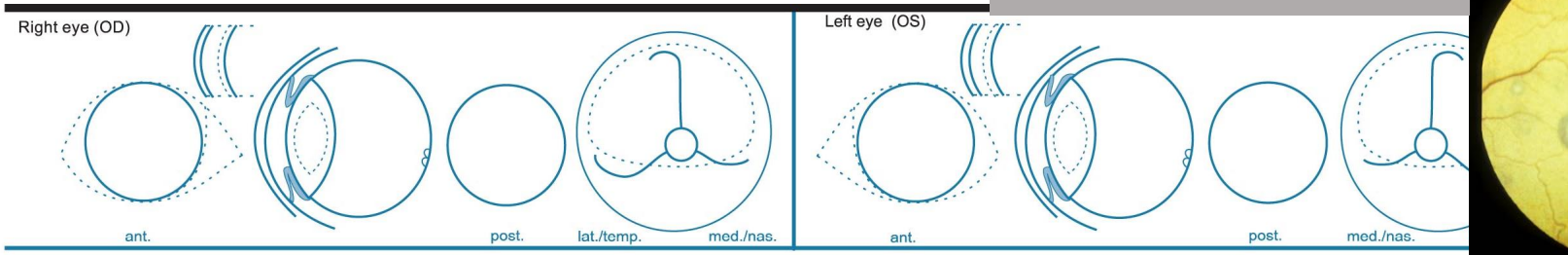
◆ 4. Retinal Dysplasia- Geographical

● Comments: (Chorio-) retinopathy, inheritance under investigation

■ 18. Other: Chorioretinopathy, primary retinal disease

Lapponian Shepherd 2y, OS
Slide: FS





Descriptive comments: .....

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Eye disease no. ..... ☐ severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

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	UNAFFECTED	suspicious / undetermined	AFFECTED
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3. Cataract (congenital)	X		
4. Retinal Dysplasia (RD)	X		☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	X		
6. Collie Eye Anomaly (CEA)	X		☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	X		
8. IridoCorneal Angle Abnormality. (ICAA)			☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	X		
12. Ectropion / Macroblepharon	X		
13. Distichiasis / Ectopic cilia	X		
14. Corneal dystrophy	X		
15. Cataract (later onset)	X		☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	X		
17. Retinal degeneration (PRA)	X		
18. Other:			X

(CMR) Canine multifocal retinopathy

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

Canine multifocal retinopathy (CMR):

KP-HED; autosomal mode of inheritance suspected. DNA-tests for specific breeds are available. Recognized as barely progressive, grey to tan bulging areas of circumscribed retinal detachments, generally more or less up to one optic disc diameter

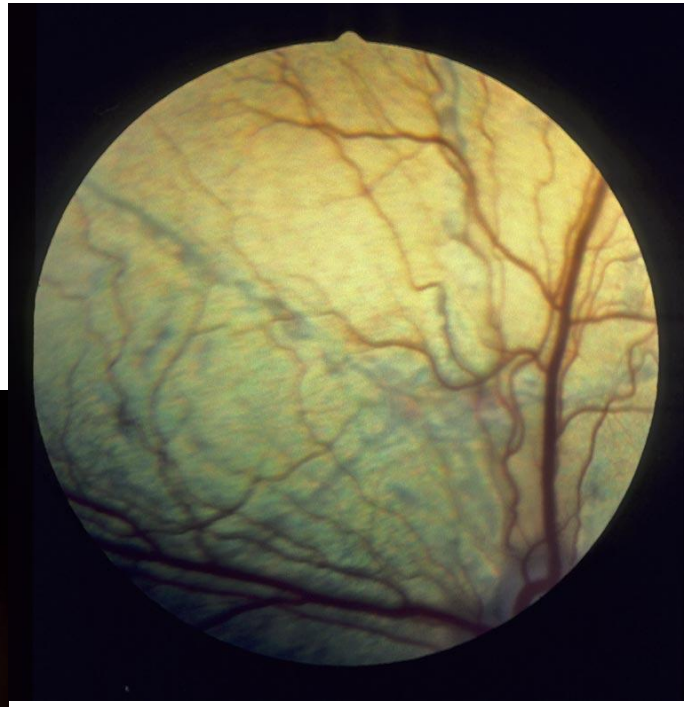
18. Other: Retinopathy, Canine multifocal (CMR)

Breeds: Great Pyrenees, Coton de Tulear, Eng-, French-, Bull mastiff, Lapponian Shepherd

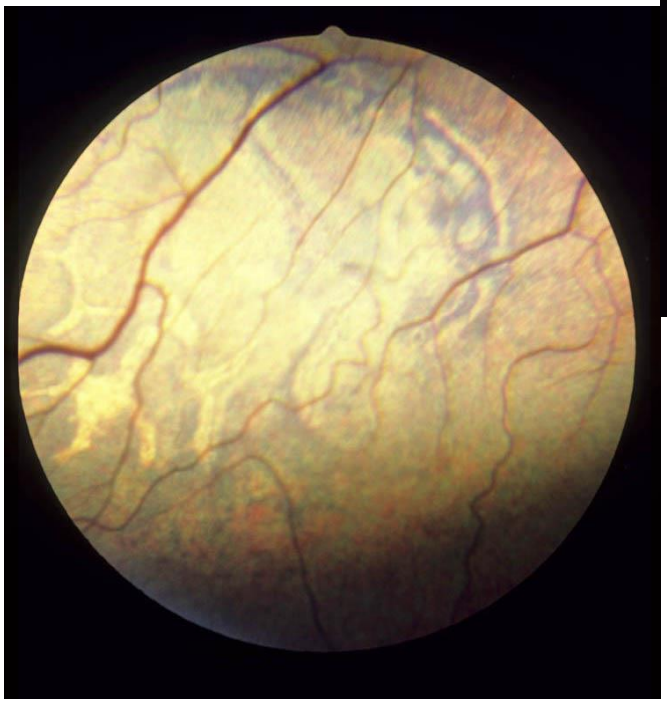
Also see ECVO Retina Atlas 2022

Not to be confused with e.g. Retinal Dysplasia:

a. Focal/Multifocal



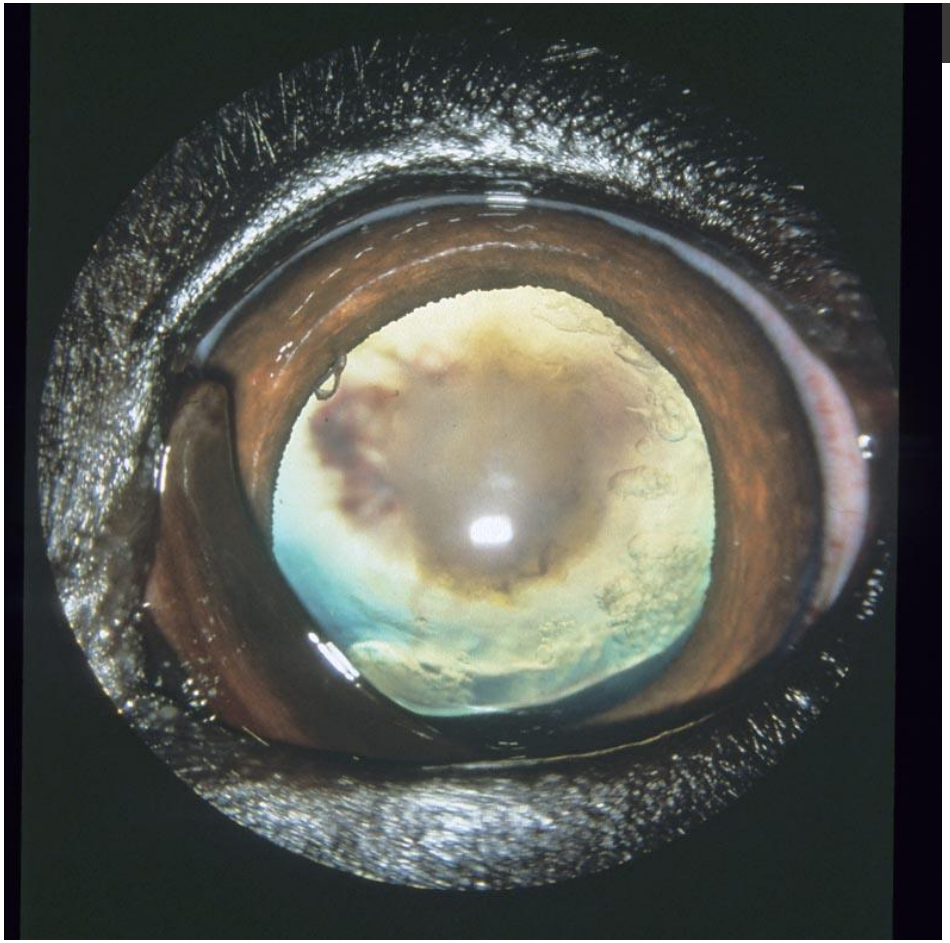
b. Geographical



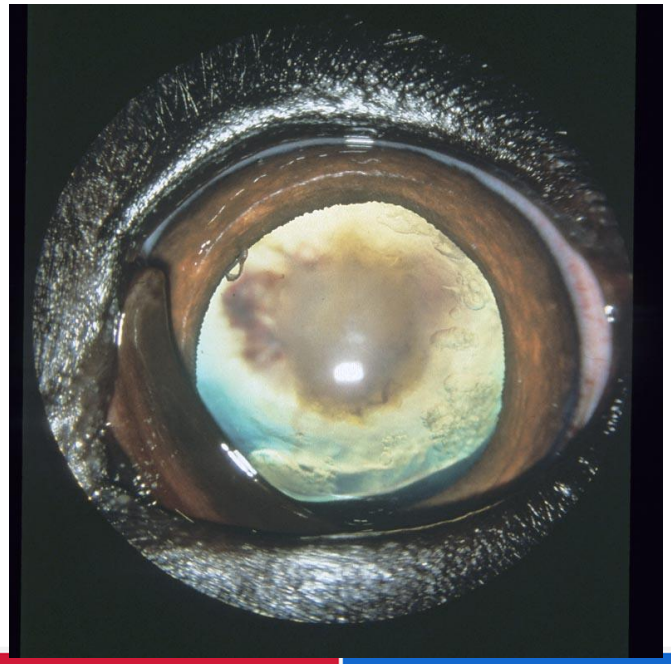
HED SESSION – Kahoot!

Case 6

Dobermann, 1 y, m, bilateral slide: FS



Dobermann, 1 y, m, bilateral slide: FS



▲ 3. Cataract-(congenital) – post pol.

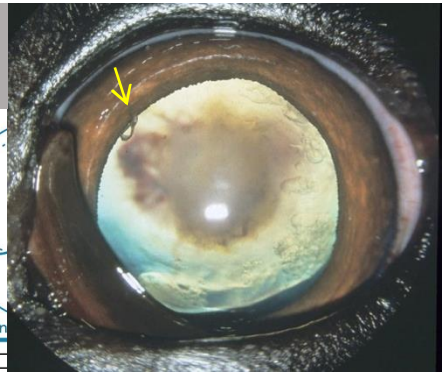
◆ 2. PHTVL/PHPV-Grade 2-6 ; Comm: TVL ant-persist.

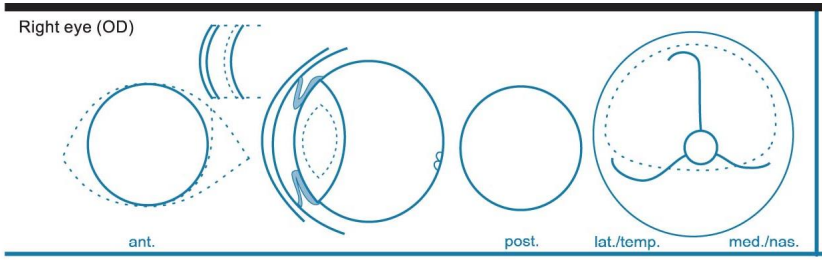
● 2. PHTVL/PHPV-Grade 2-6 + Lens hypoplasia; Comm: PPM

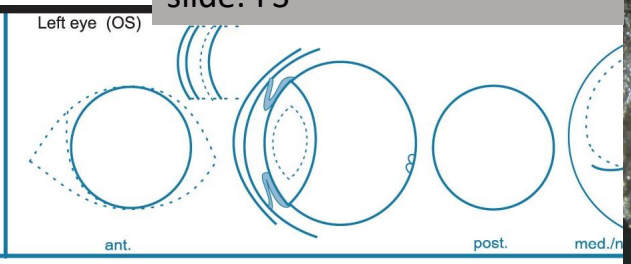
■ 2. PHTVL/PHPV- Grade 2-6; Comm: TVL ant-persist.+ Cataract + lens hypoplasia

ECVO

Dobermann, 1 y, m, bilateral
slide: FS







Descriptive comments: TVL anterior persistens

Eye disease no. ..... ☐ severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	X	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☐	☐	X ☐ grade 1 X ☐ grade 2-6
3. Cataract (congenital)	X	☐	☐
4. Retinal Dysplasia (RD)	X	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	X	☐	☐
6. Collie Eye Anomaly (CEA)	X	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	X	☐	☐
8. IridoCorneal Angle Abnormality. (ICAA)	☐		☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	X	☐	☐
12. Ectropion / Macroblepharon	X	☐	☐
13. Distichiasis / Ectopic cilia	X	☐	☐
14. Corneal dystrophy	X	☐	☐
15. Cataract (later onset)	X	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	X	☐	☐
17. Retinal degeneration (PRA)	X	☐	☐
18. Other:	X	☐	☐

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

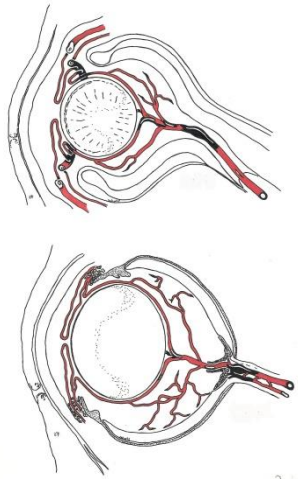
Persistent hyperplastic tunica vasculosa lentis/persistent hyperplastic primary vitreous (PHTVL/PHPV)

KP-HED; congenital eye disease which results from **failure of regression of the embryologic vascular network, surrounding the developing lens and primary vitreous**. The latter fails to regress within the first 2-3 weeks after birth. The defect is currently graded in 6 levels of severity, in which grade 1 is characterized by uni- or bilateral small, yellow to brown dots of fibrous tissue mainly centrally, retrolentally on the posterior capsule of the lens. These are stationary and do not affect vision.

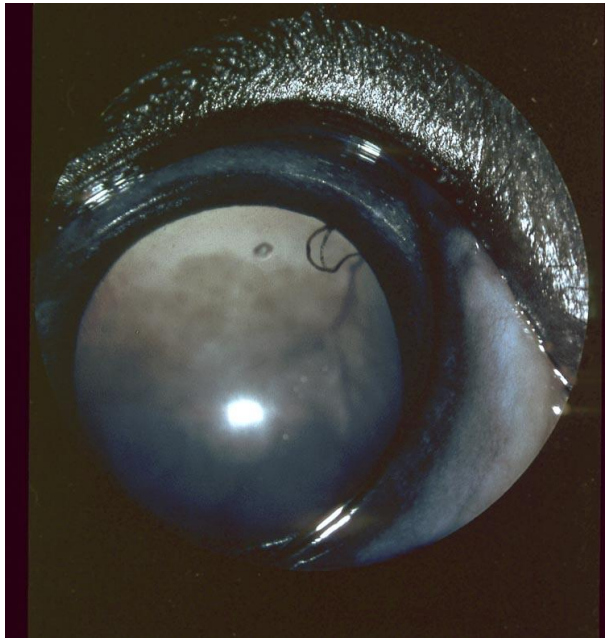
The more severe forms (2-6) usually occur bilaterally and cause visual impairment or blindness. Known hereditary e.g. in the Dobermann and the Staffordshire Bull Terrier

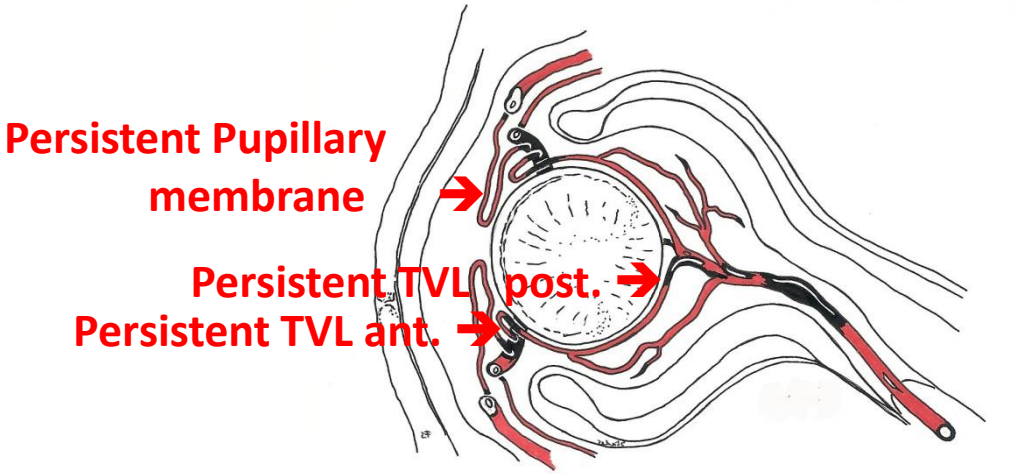
HED Manual Chapter 5 Definitions:

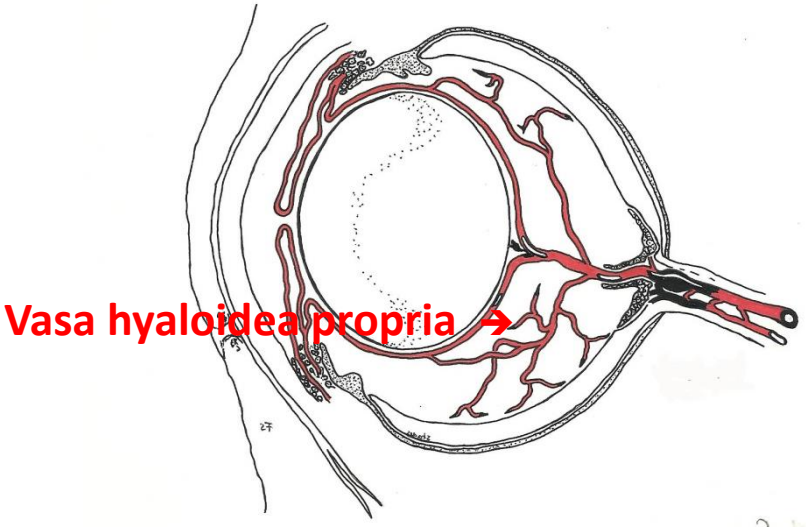
Tunica vasculosa lentis (TVL): embryonic vascular network which surrounds the lens; The TVL, vasa hyaloidea propria and the pupillary membrane normally fully regress between 2 to 4 weeks after birth, starting from post to anterior, except a minor pig-tail-like remnant attached just below the center of the posterior lens capsule, extending into the vitreous. Persistence of one or more portions is seen. The most common is persistence of parts of the anterior portion, the pupillary membrane, which is referred to as persistent pupillary membrane (PPM).



TVL persistens ant.: on iris connecting to the collarette







PHTVL/PHPV grades 2-6:

The severe forms (grades 2–6) usually occur bilaterally and may lead to visual problems.

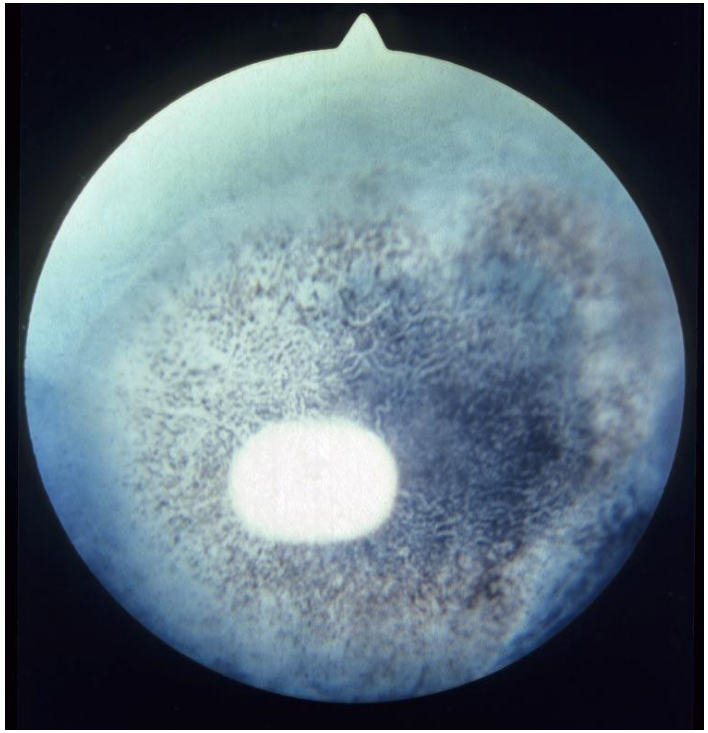
A plaque of white fibrovascular tissue can remain on the back of the posterior capsule, accompanied by grade 1 retrolental dots. In addition, other parts of the hyaloid system can persist and more severe malformations of the lens (such as lenticonus, pigment or blood in the lens or behind it, lens hypoplasia, spherophakia), elongated ciliary processes and/or microphthalmia may be present. Unilateral or bilateral forms of grades 2-6 are ticked at “2. PHTVL/PHPV “affected” and the specifying box “grade 2-6”.

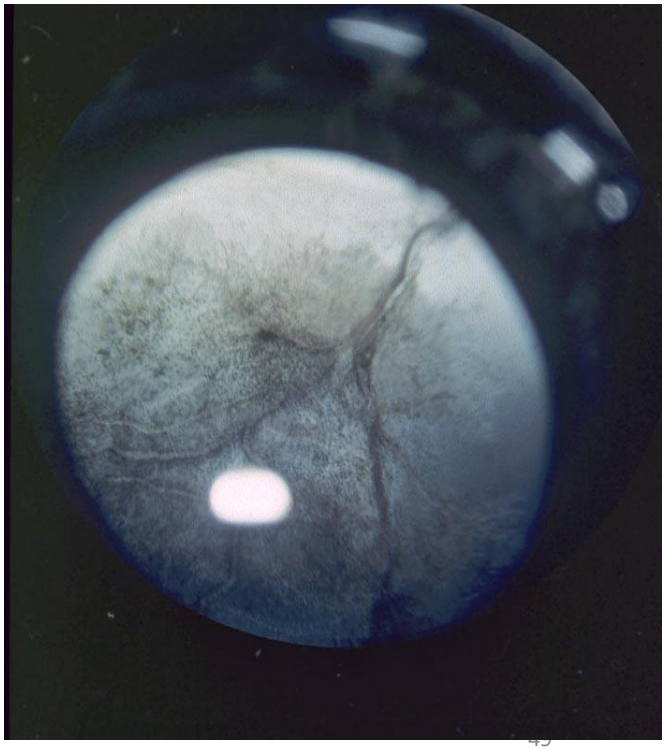
PHTVL/PHPV grades 2-6

Cataract and/or other lenticular abnormalities are part of the entity and are therefore not ticked at "3. Cataract (congenital)" and/or at "7. Other".

HED Manual Chapter 6. Guidelines

Fibrovascular tissue + dots



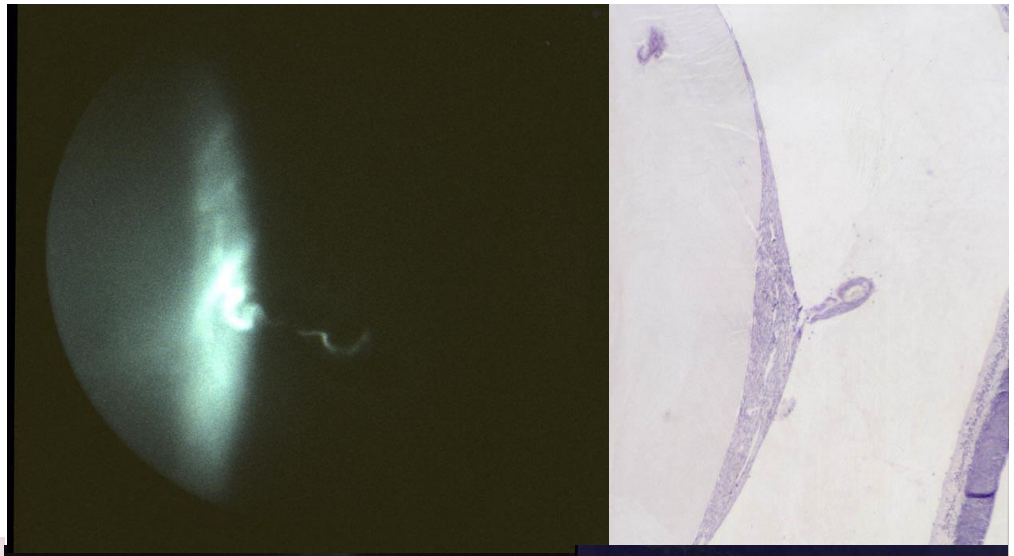


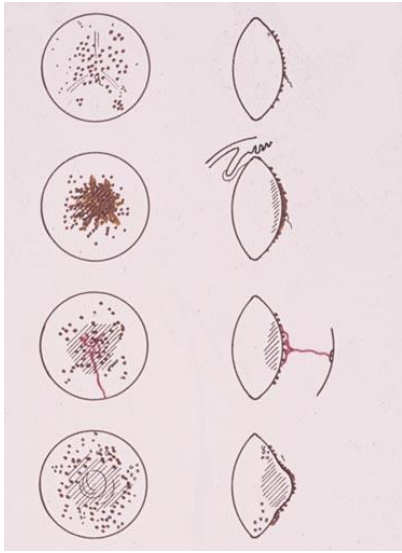
HED SESSION

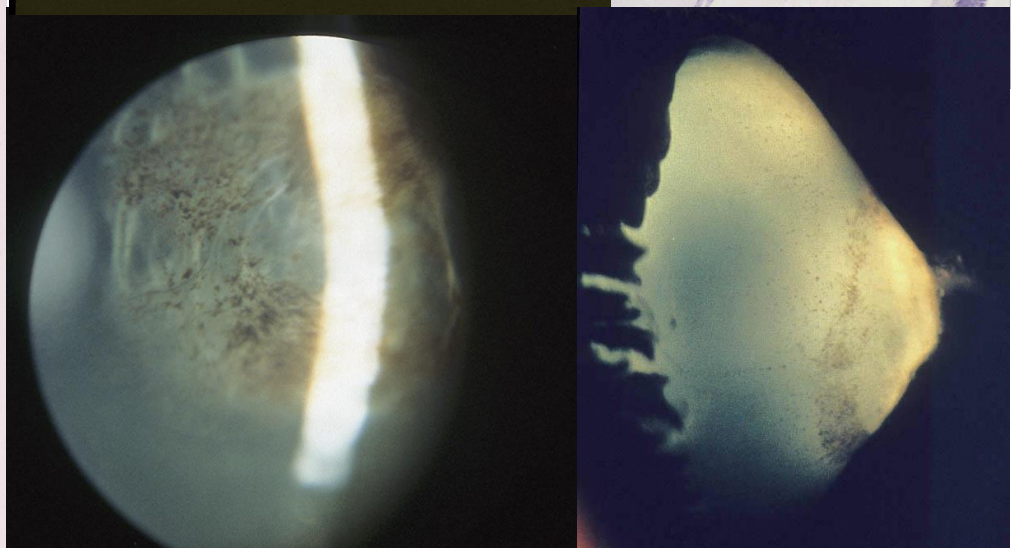
HED Manual Chapter 6. Guidelines

+ **Hyaloid artery**

+ **lenticonus post.**

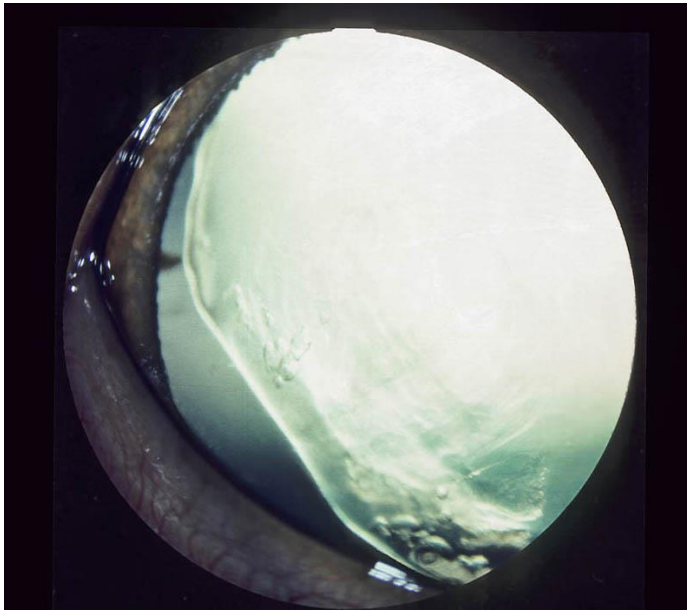




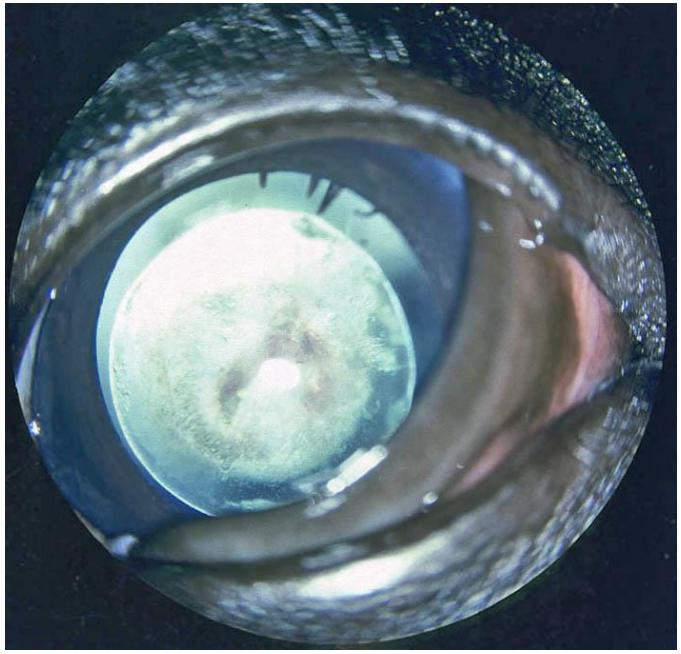


HED Manual Chapter 6 Guidelines: (PHTVL/PHPV): 2-6

lens hypoplasia



elongated ciliary processes microphakia



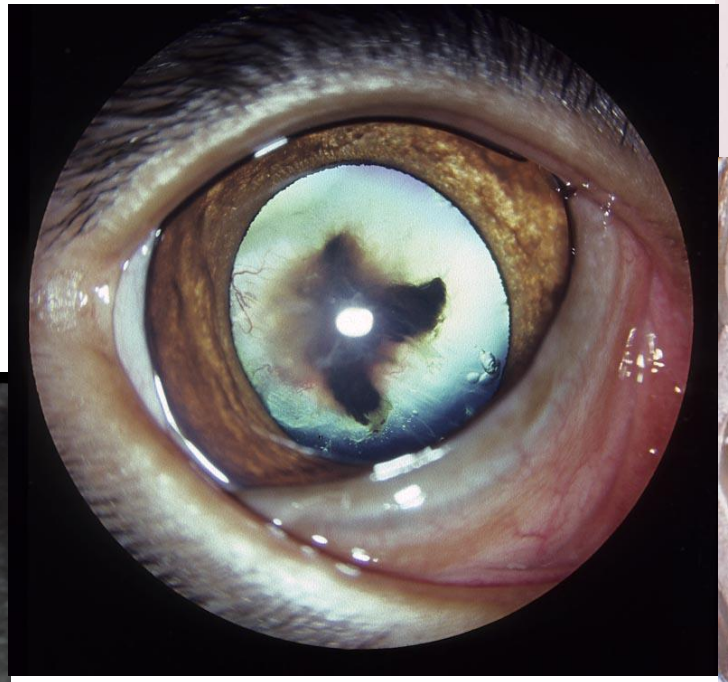
HED SESSION

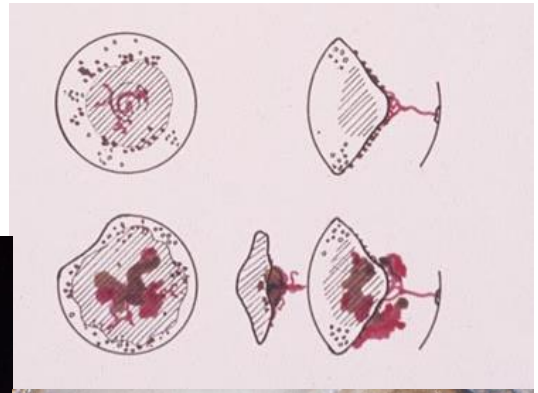
HED Manual Chapter 6. Guidelines

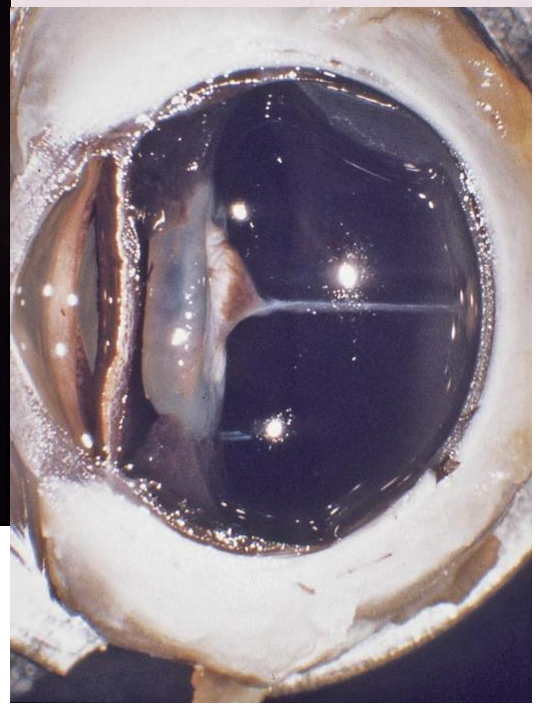
Spherophakia

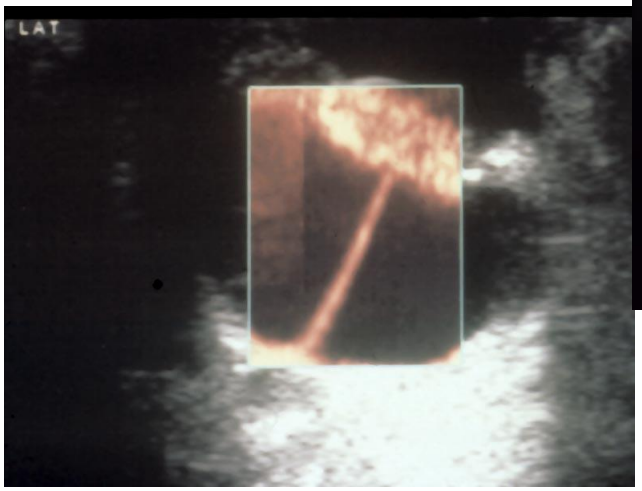
Persistent hyaloid artery

Fibrous or patent



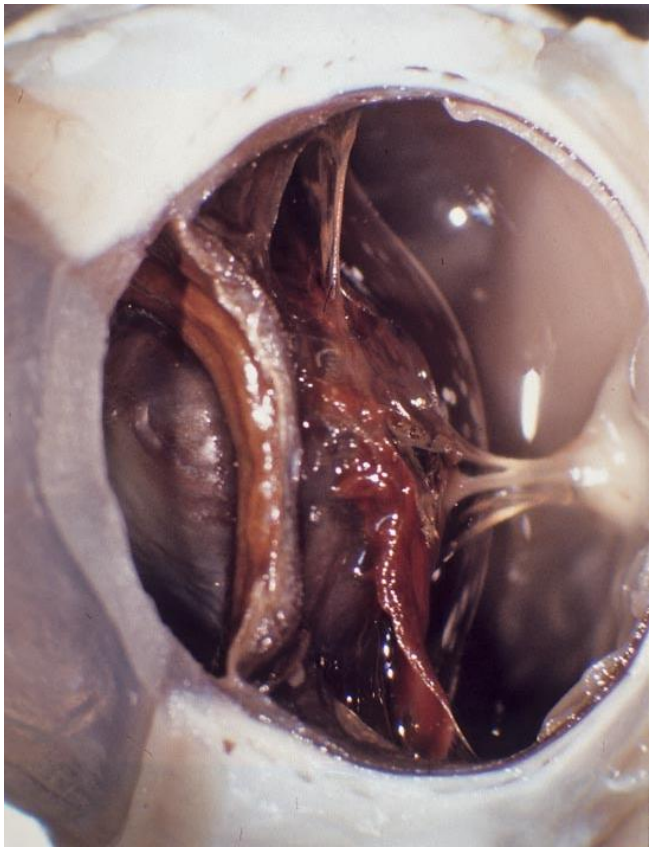




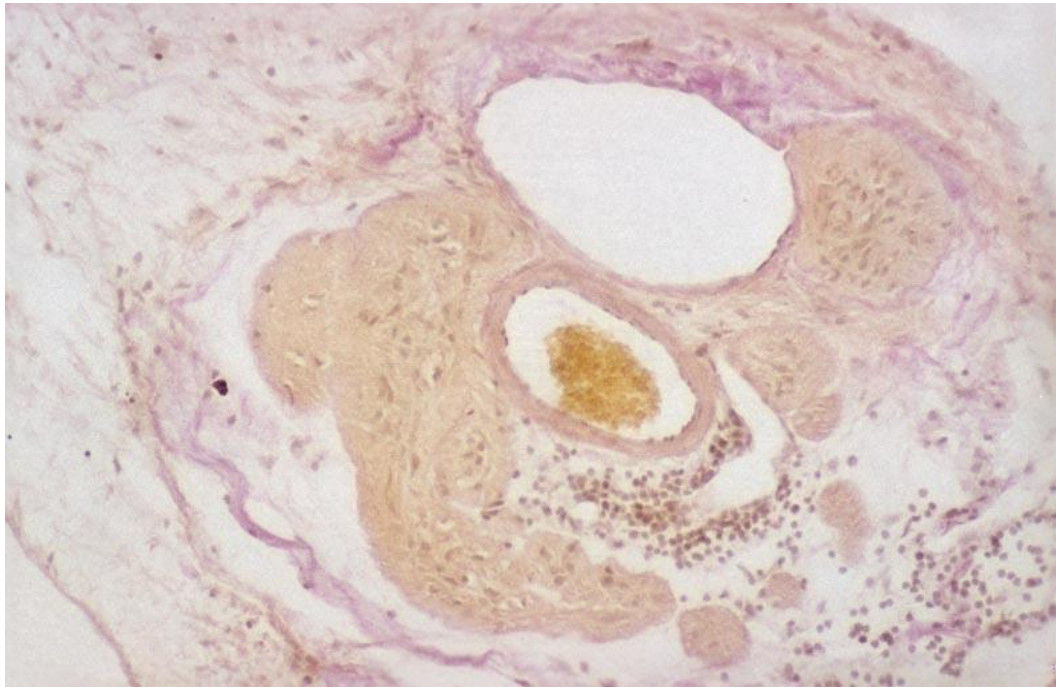


HED SESSION

HED Manual Chapter 6. Guidelines:



Extreme Hyaloid Art. Persist.: Artery + Vein



2. Persistent hyperplastic tunica vasculosa lentis/persistent hyperplastic primary vitreus (PHTVL/PHPV):

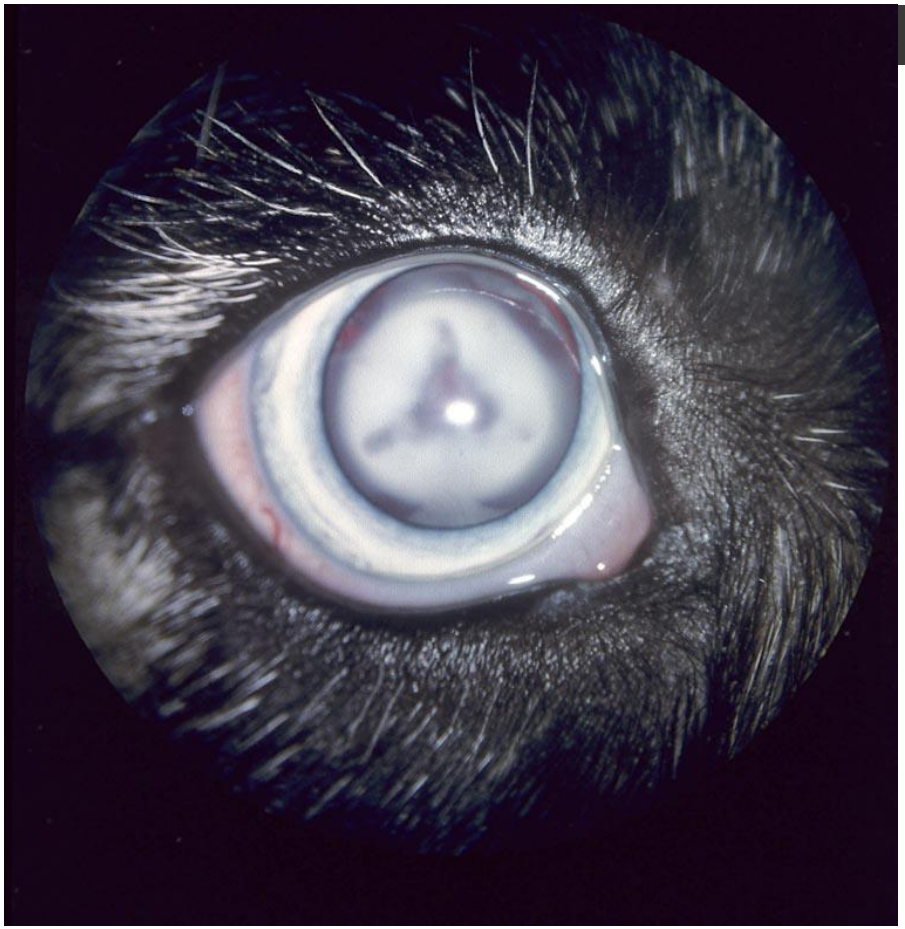
- Grade 1: OPTIONAL (NL: grade 1 x unaffected)
- **Grade 2-6: NO BREEDING** from the affected animal

(In NL PHTVL/PHPV in Dobermann is eradicated)

HED SESSION – Kahoot!

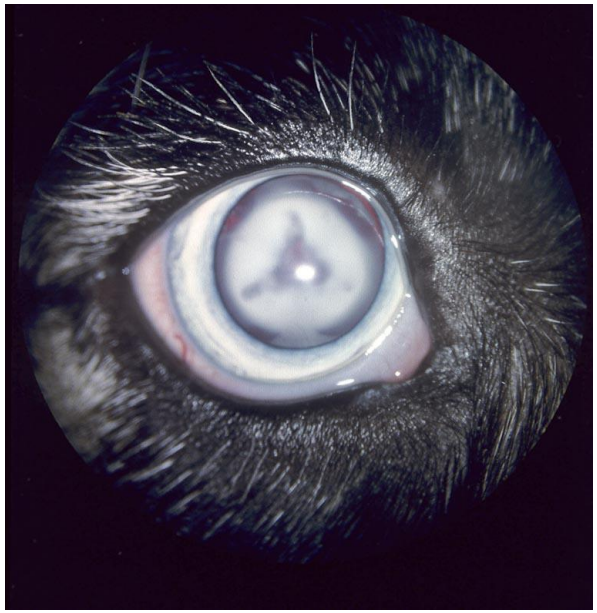
Case 7

Bobtail, 12 weeks, m, unilateral , fundus no abnormalities. slide: FS



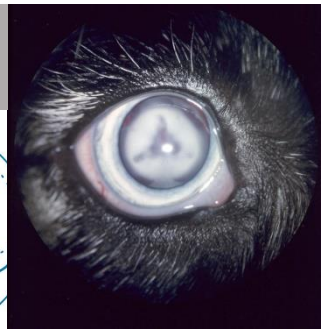
OD

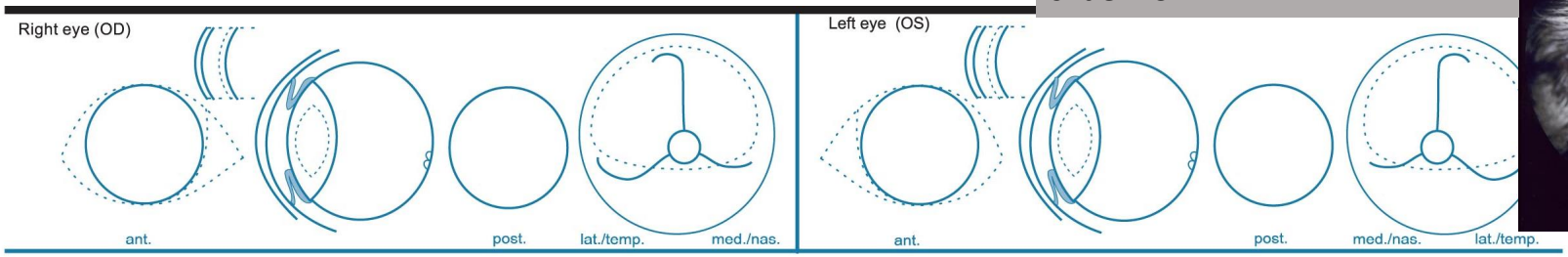
Bobtail, 12 weeks, m, unilateral, fundus no abnormalities. slide: FS



▲ 2. PHTVL/PHPV-Grade 2-6	◆ 15. Cataract (later onset) – post polar
● 3. Cataract (congenital)	■ 7. Other: Cataract (congenital)- post polar

Bobtail, 12 weeks, m, Bilateral
slide: FS





Descriptive comments: .....

.....

.....

Eye disease no. ..... ☐ severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	X		☐ iris ☐ cornea ☐ lens ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	X		☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)			X
4. Retinal Dysplasia (RD)	X		☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	X		
6. Collie Eye Anomaly (CEA)	X		☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	X		
8. IridoCorneal Angle Abnormality. (ICAA)			☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	X		
12. Ectropion / Macroblepharon	X		
13. Distichiasis / Ectopic cilia	X		
14. Corneal dystrophy	X		
15. Cataract (later onset)	X		☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	X		
17. Retinal degeneration (PRA)	X		
18. Other:	X		

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

Cataract

is an opacity (generally whitish) in different shapes and sizes in the lens nucleus, and/or cortex and/or capsule; it is resulting from pathologic changes in lens protein composition or disruption of lens fiber arrangement.

Clinical significance: The clinical significance is influenced by the extent, density and location of the opacity, as well as its potential to progress, which leads to scattering of incident light, reduced illumination, reduced contrast sensitivity, increased glare, degraded color vision, and loss of visual acuity and visual function.

Classification according to aetiology:

- **Primary cataracts: all bilateral or unilateral cataracts and especially cortical cataracts are KP-HEDs** (except secondary cataracts)

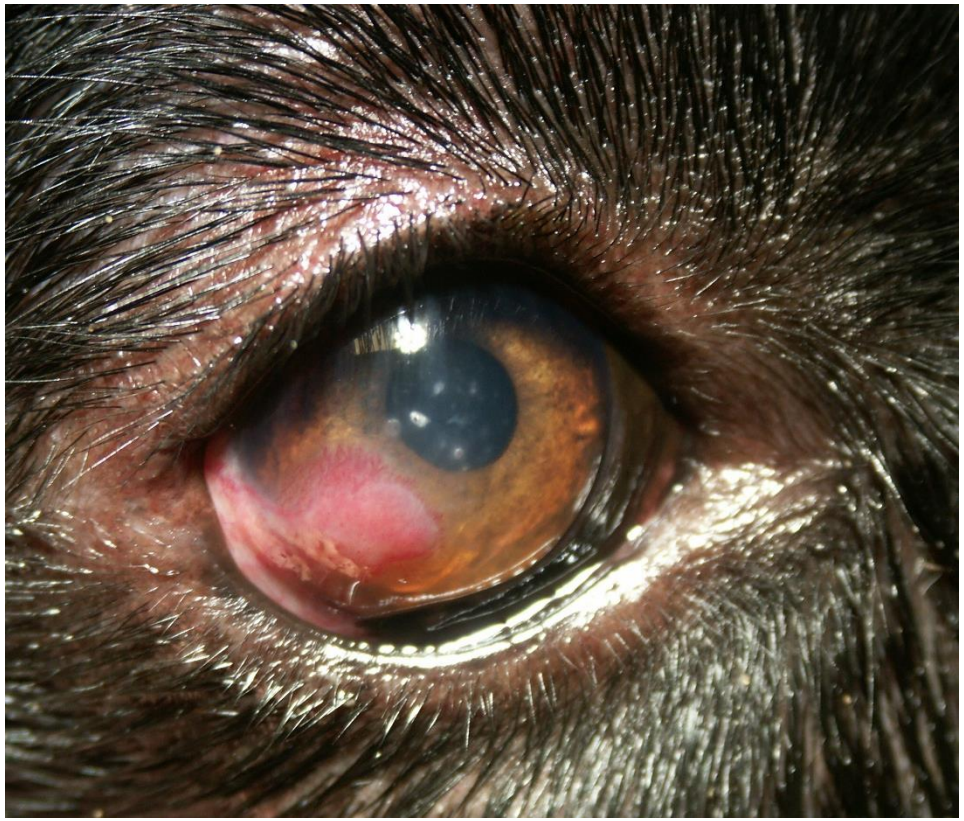
Classification according to age of onset:

- **Congenital cataracts:** If cataracts are observed in the period **between birth and the 12th week** of age the entity is ticked “affected” at “3. Cataract (congenital)”;
- if diagnosed **later in life** but there is **distinct indication** the cataract is **congenital in origin** (e. g. in microphthalmos, in the lens cortex adjacent to PPM, or PHA) the entity is ticked “affected” at “3. Cataract (congenital)”.

HED SESSION – Kahoot!

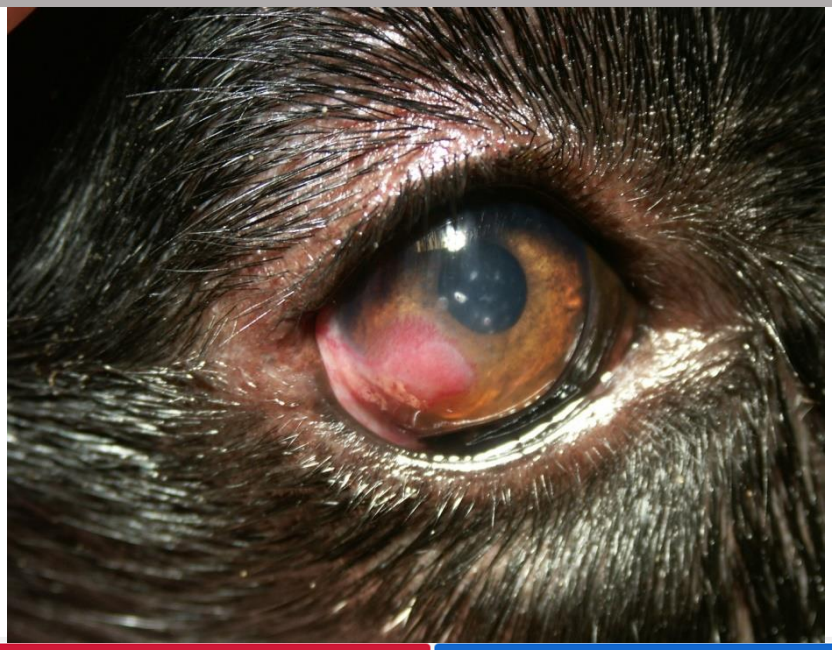
Case 8

Belgian shepherd Tervueren, 4 y, f, bilateral slide: FS



OD

Belgian Shepherd Tervueren, 4 y, f, bilateral slide: FS



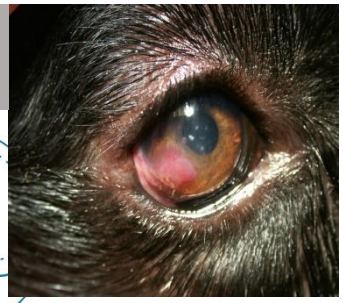
▲ 18. Other: Plasmoma/plasmacellular conjunctivitis, Keratitis pigmentary

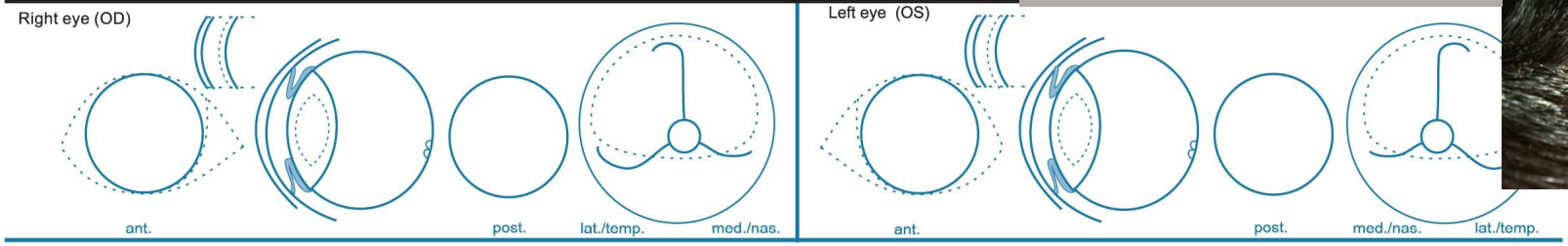
◆ 18. Other: Keratitis, pigmentary

● 18. Other: Keratitis, chronic superficial CSK/Pannus

■ 18. Other: Plasmoma/plasmacellular conjunctivitis

Shepherd Servierens, 4 y, f, bilateral slide: FS





Descriptive comments: .....

.....

.....

Eye disease no. ..... ☐ severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	X		☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	X		☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	X		
4. Retinal Dysplasia (RD)	X		☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	X		
6. Collie Eye Anomaly (CEA)	X		☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	X		
8. IridoCorneal Angle Abnormality. (ICAA)			☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	X		
12. Ectropion / Macroblepharon	X		
13. Distichiasis / Ectopic cilia	X		
14. Corneal dystrophy	X		
15. Cataract (later onset)	X		☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	X		
17. Retinal degeneration (PRA)	X		
18. Other: Keratitis, chronic superficial (CSK)/Pannus			X

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

HED Manual Chapter 5 Definitions:

Chronic superficial keratitis(CSK)/Pannus

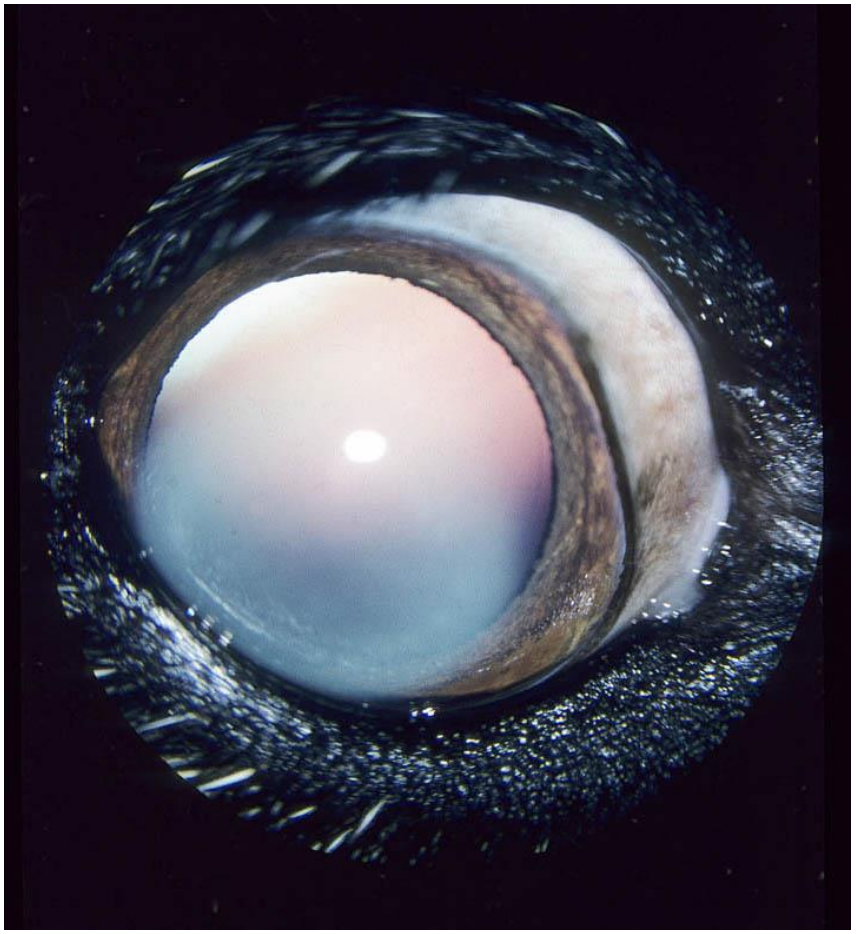
KP-HED; bilateral inflammatory disease of the cornea which usually starts as a greyish haze at the inferior or inferio-temporal cornea, followed by the formation of a vascularized subepithelial opacity that begins to spread towards the central cornea; pigmentation follows the vascularization. Vision impairment occurs, if severe.

The disease can be seen with concurrent **plasmoma/ plasmacellular conjunctivitis** and/or medial canthus erosion

HED SESSION – Kahoot!

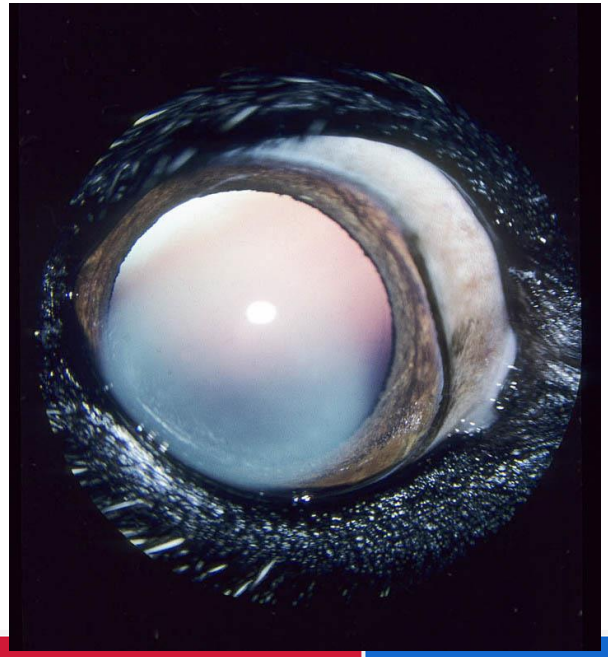
Case 9

Husky, 4 y, f, bilateral slide: FS



OS

Husky, 4 y, f, bilateral slide: FS



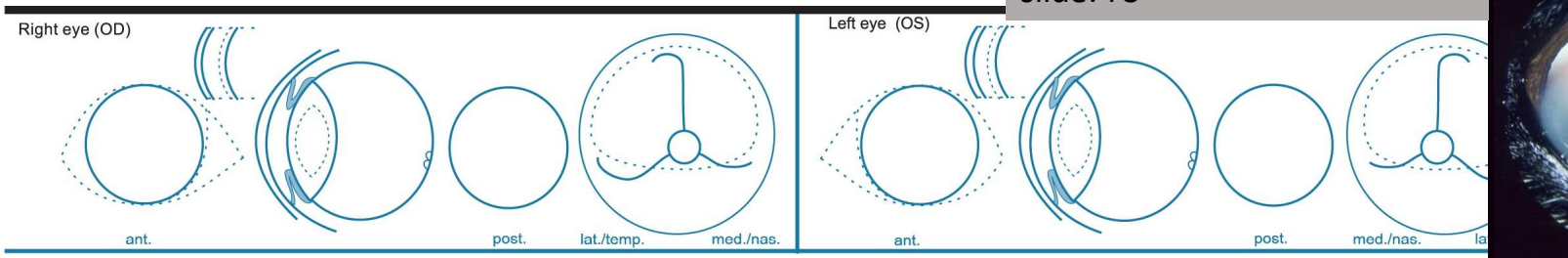
▲ 14. Corneal dystrophy; 14. severe; comm: C. dys. macular

◆ 14. Corneal dystrophy; 14. severe - comm: C. dys. stromal

● 14. Corneal dystrophy; 14. severe; comm: C. dys. endothelial

■ 14. Corneal dystrophy; comm: C. dys. Stromal

Husky, 4 y, f, bilateral
slide: FS



Descriptive comments: **14. Corneal dystrophy, stromal**

Eye disease no. **14. Corneal dystrophy** X severe

15. Other lens opacity: ☐ punctata; ☐ suture line tip; ☐ suture line; ☐ nuclear ring; ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	X		☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	X		☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	X		
4. Retinal Dysplasia (RD)	X		☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	X		
6. Collie Eye Anomaly (CEA)	X		☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	X		
8. IridoCorneal Angle Abnormality. (ICAA)			☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	X		
12. Ectropion / Macroblepharon	X		
13. Distichiasis / Ectopic cilia	X		
14. Corneal dystrophy			X
15. Cataract (later onset)	X		☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	X		
17. Retinal degeneration (PRA)	X		
18. Other:	X		

Interpretation

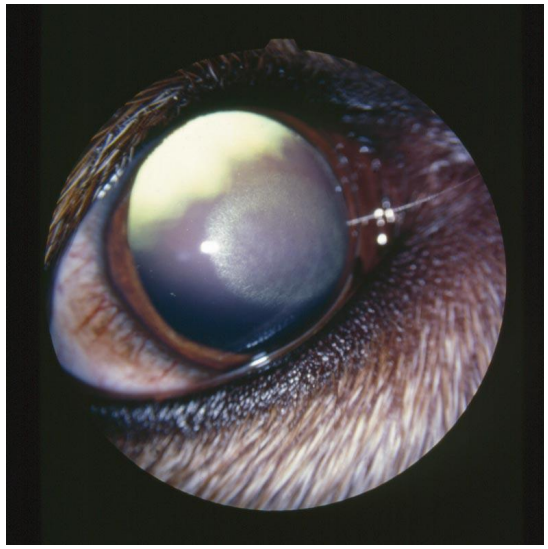
"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

HED Manual Chapter 5 Definitions

Corneal dystrophy:

KP-HED; non-inflammatory corneal opacity in one or more of the corneal layers (epithelium, stroma, endothelium). It is usually bilateral but not always symmetrical.

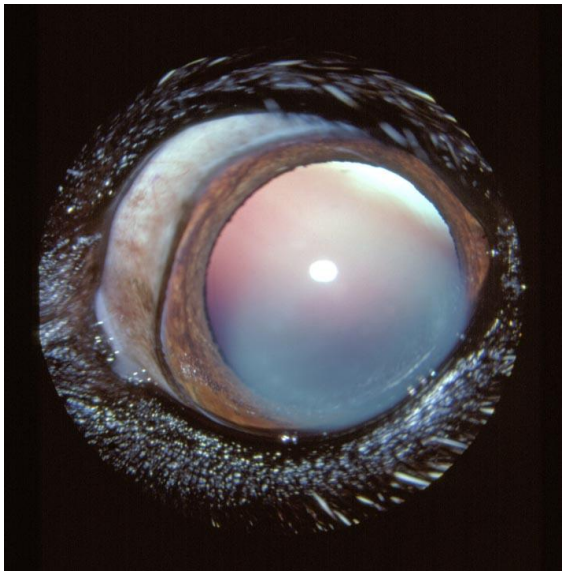
Corneal dystrophy, epithelial/stromal: KP-HED; non-inflammatory corneal opacity (white to grey with crystalline appearance) in one or more of the corneal layers. Often it is associated with deposits of cholesterol and other lipids (or fats) within the cornea.



HED Manual Chapter 5 Definitions

Corneal dystrophy, epithelial/stromal:

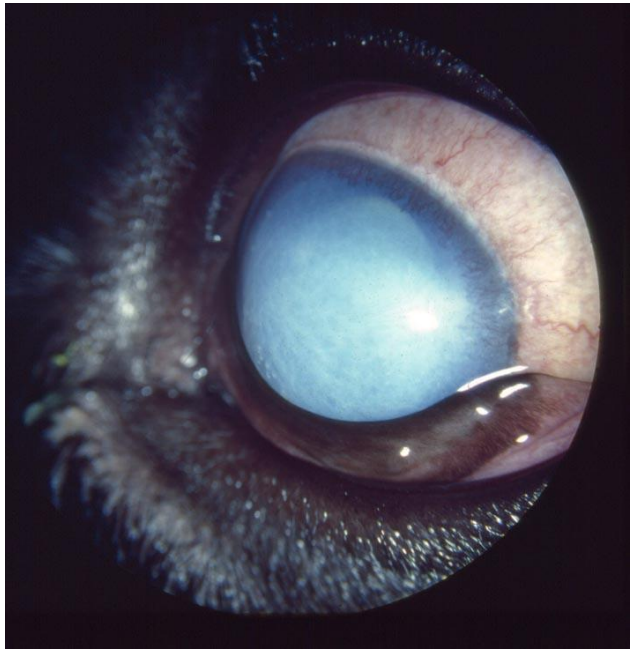
KP-HED; non-inflammatory corneal opacity (white to grey with crystalline appearance) in one or more of the corneal layers. Often it is associated with deposits of cholesterol and other lipids (or fats) within the cornea.



HED Manual Chapter 5 Definitions

Corneal dystrophy, endothelial:

KP-HED; abnormal loss of the inner lining (endothelium) of the cornea causing progressive fluid retention (edema) leading to increased corneal thickness, keratitis, corneal clouding and decreased vision.



E1

HED Manual Chapter 5 Definitions

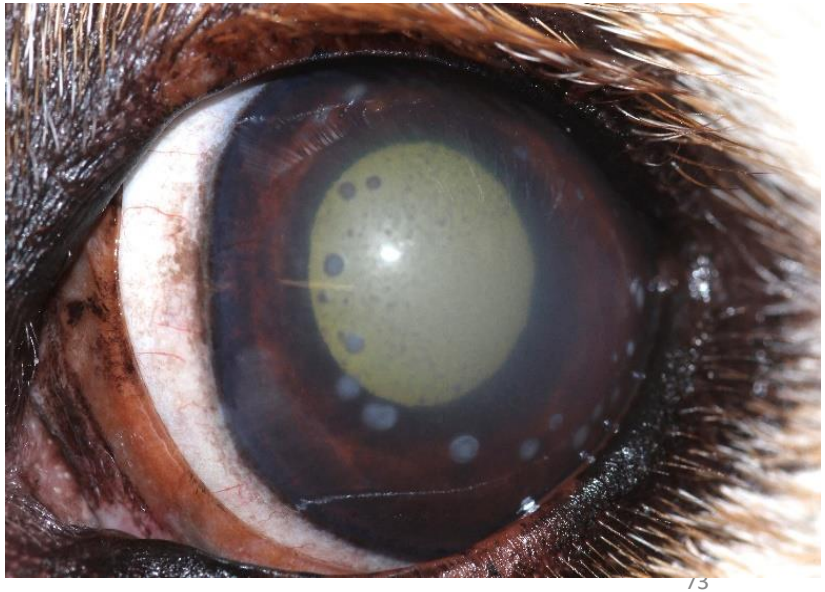
Corneal dystrophy, macular:

KP-HED; there is a bilateral diffuse haziness of the cornea, and there are multiple whitish/grey macula-like lesions throughout the corneal stroma. The periphery appears slightly less affected. Density and size of the lesions progresses throughout life leading to quite severe visual impairment.

DNA-tests for specific breeds are available.

Macular C dystrophy

Courtesy: **Dr. Claudia Busse**



Folie 73

E1 Eigenaar; 10.03.2024

HED Manual Chapter 6 Guidelines

In cases of:

- endothelial dystrophy (bilateral progressive diffuse, deep corneal edema, e.g. in Chihuahua, Boston Terrier etc.) or

- macular dystrophy (bilateral diffuse haziness of the cornea with multiple whitish/grey macula like lesions throughout the corneal stroma, periphery slightly less affected, e.g. in Labrador Retriever) or

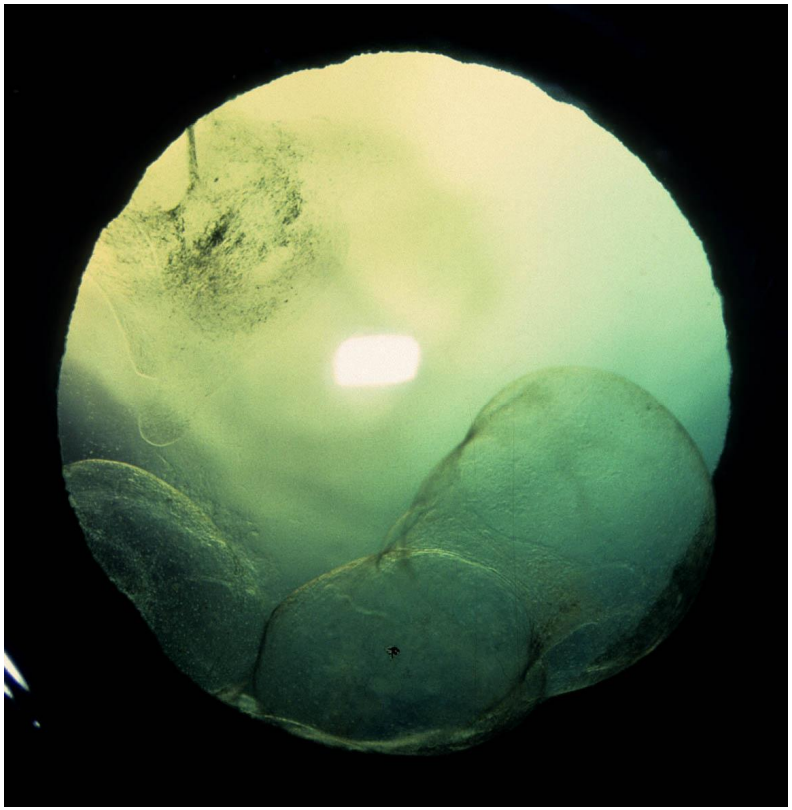
- **Severe forms of stromal dystrophy** (e.g. in Siberian Husky)

The box "severe" is to be ticked in the descriptive comments area.

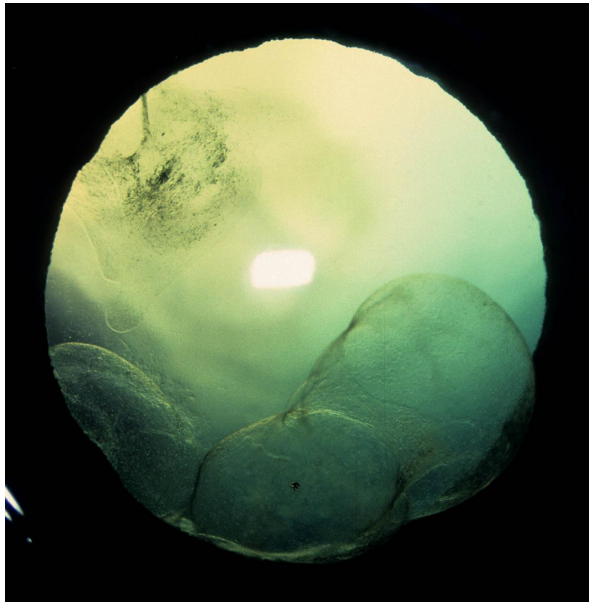
HED SESSION – Kahoot!

Case 10

Great Dane, 6 years Slide: Frans Stades



Great Dane, 6 years Slide: Frans Stades



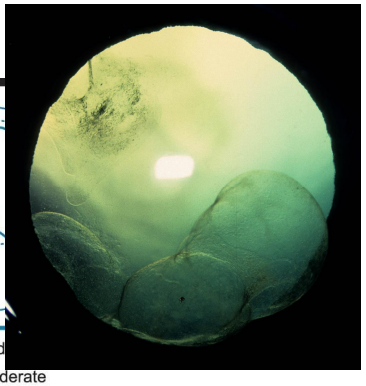
▲ 14. Cataract: cortical

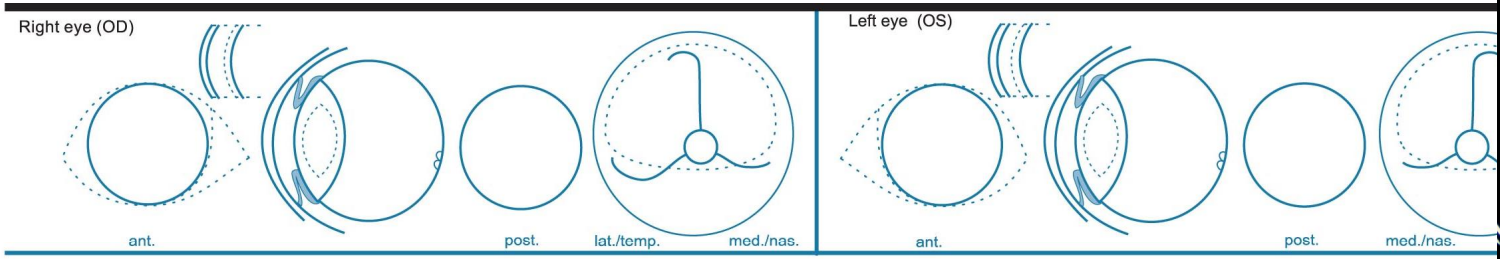
◆ 18. Other: Uveal Cysts; 18. severe

● Comm: synechia posterior

■ 18. Other: Uveal cysts

ECVO





Descriptive comments: .....

.....

.....

Eye disease no. 18. Uveal cysts ..... [X] severe

15. Other lens opacity: [ ] punctata; [ ] suture line tip; [ ] suture line; [ ] nuclear ring; [ ] nuclear fiberglass/pulverulent

8. ICAA: PLA [ ] mild; [ ] moderate; [ ] severe

ICA (width) [ ] narrow (moderate); [ ] closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	[X]	[ ]	[ ] iris [ ] lens [ ] cornea [ ] lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	[X]	[ ]	[ ] grade 1 [ ] grade 2-6
3. Cataract (congenital)	[X]	[ ]	[ ]
4. Retinal Dysplasia (RD)	[X]	[ ]	[ ] (multi)focal [ ] geographical [ ] total
5. Hypoplastic-/Micro-papilla	[X]	[ ]	[ ]
6. Collie Eye Anomaly (CEA)	[X]	[ ]	[ ] choroid. hypoplasia [ ] coloboma [ ] other:
7. Other:	[X]	[ ]	[ ]
8. IridoCorneal Angle Abnormality. (ICAA)	[ ]		[ ] mild [ ] moderate [ ] severe

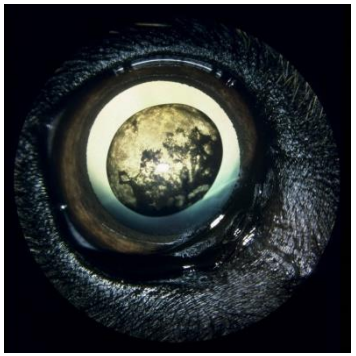
Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	[X]	[ ]	[ ]
12. Ectropion / Macroblepharon	[X]	[ ]	[ ]
13. Distichiasis / Ectopic cilia	[X]	[ ]	[ ]
14. Corneal dystrophy	[X]	[ ]	[ ]
15. Cataract (later onset)	[X]	[ ]	[ ] cortical [ ] post. pol. [ ] nuclear [ ] other lens opacity
16. Lens luxation (primary)	[X]	[ ]	[ ]
17. Retinal degeneration (PRA)	[X]	[ ]	[ ]
18. Other: Uveal cysts	[ ]	[ ]	[X]

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

HED Manual Chapter 5 Definitions



Uveal cyst:

KP-HED; **usually pigmented membrane spheres of various sizes**, arising from posterior pigmented epithelial cells of the iris/ciliary body and which remain attached, or break free floating as more or less pigmented spheres in the anterior or posterior chamber or occasionally in the vitreous.

When reaching maximal size, cysts tend to adhere to the endothelial surface in the center of the cornea, thus causing visual impairment.

Uveal Cysts

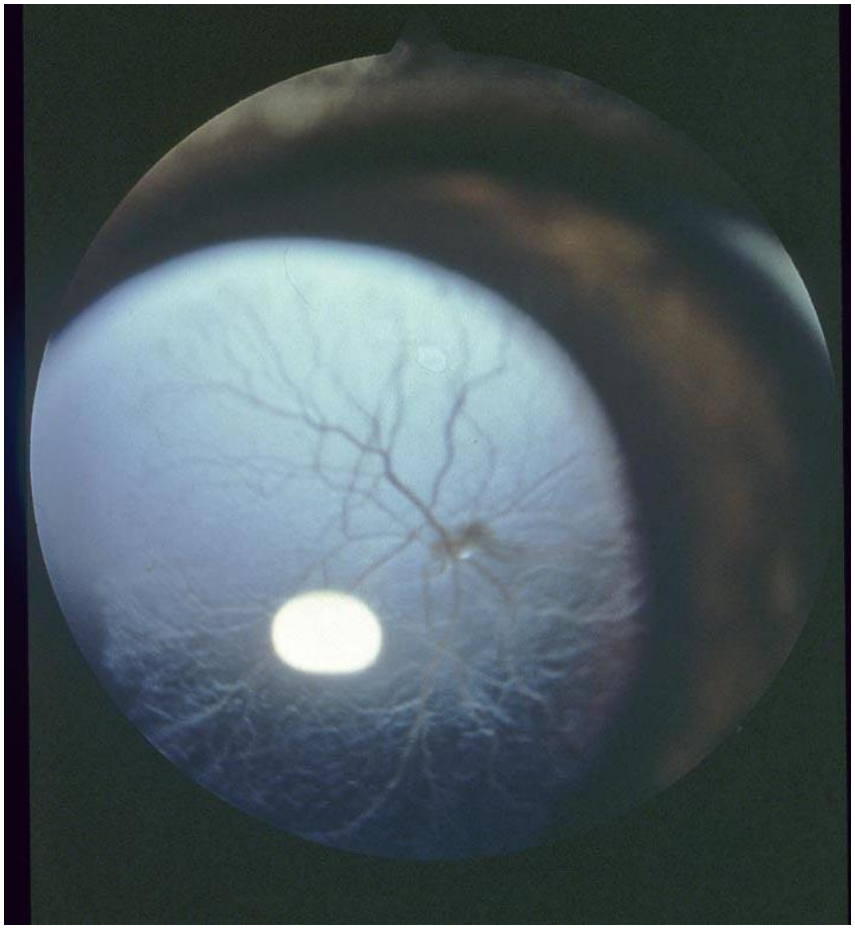
If there are only **1-3 free separate floating cysts** and no connected signs of glaucoma and/or uveitis at “18. Other”: “uveal cyst(s)” is used (on paper: written), and the box “affected” is ticked.

Only if there are **several cysts and/or signs of uveitis and/or glaucoma also the box “severe”** is to be ticked in the comment area. Tonometry before dilation is recommended.

HED SESSION – Kahoot!

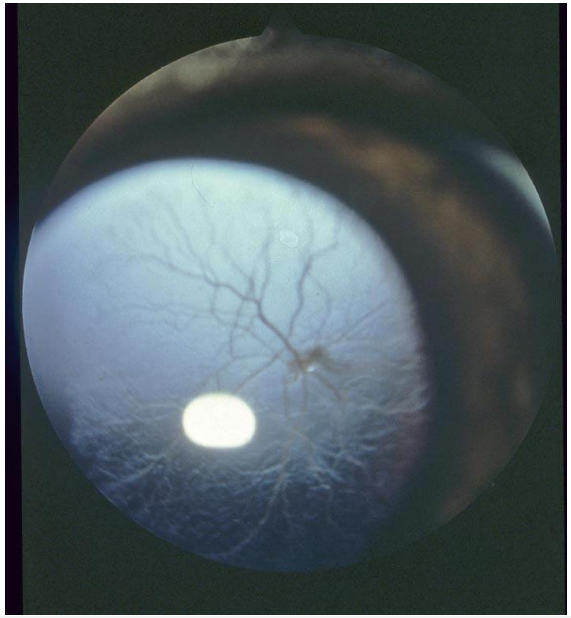
Case 11

Dobermann, 9 wk, m, bilateral, slide: FS



OS

Dobermann, 9 wk, m, bilateral, slide: FS



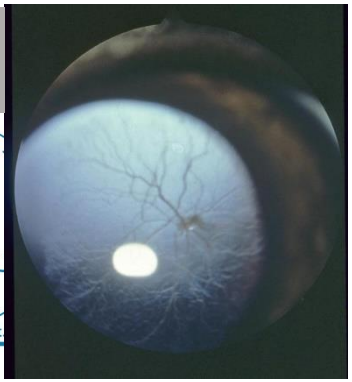
▲ 7. Other: Persistent Hyaloid artery; 7. severe; TVL post + Vasa Hyaloid prop.

◆ 2. PHTVL/PHPV Grade 2-6; Comm: lenticonus post + TVL post

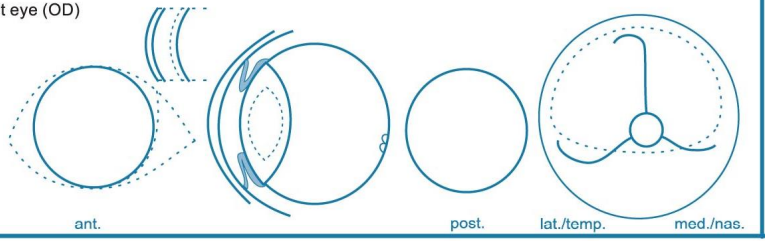
● 2. PHTVL/PHPV Grade 2-6; Comm: PHA

■ 7. Other: Persistent Hyaloid artery; 7. severe; Comm: TVLpost+Vasa Hyaloid prop.

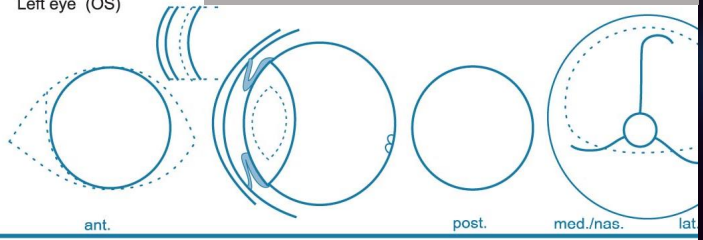
Dobermann, 9 wk, m, bilateral
slide: FS



Right eye (OD)



Left eye (OS)



Descriptive comments: **Other: TVL post + Vasa Hyaloidea propria**

Eye disease no. **7. PHA** X severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	X	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	X	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	X	☐	☐
4. Retinal Dysplasia (RD)	X	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	X	☐	☐
6. Collie Eye Anomaly (CEA)	X	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other: **Persistent Hyaloid artery**	☐	☐	X
8. IridoCorneal Angle Abnormality. (ICAA)	☐	☐	☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	X	☐	☐
12. Ectropion / Macroblepharon	X	☐	☐
13. Distichiasis / Ectopic cilia	X	☐	☐
14. Corneal dystrophy	X	☐	☐
15. Cataract (later onset)	X	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	X	☐	☐
17. Retinal degeneration (PRA)	X	☐	☐
18. Other:	X	☐	☐

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

Persistent hyaloid artery (PHA):

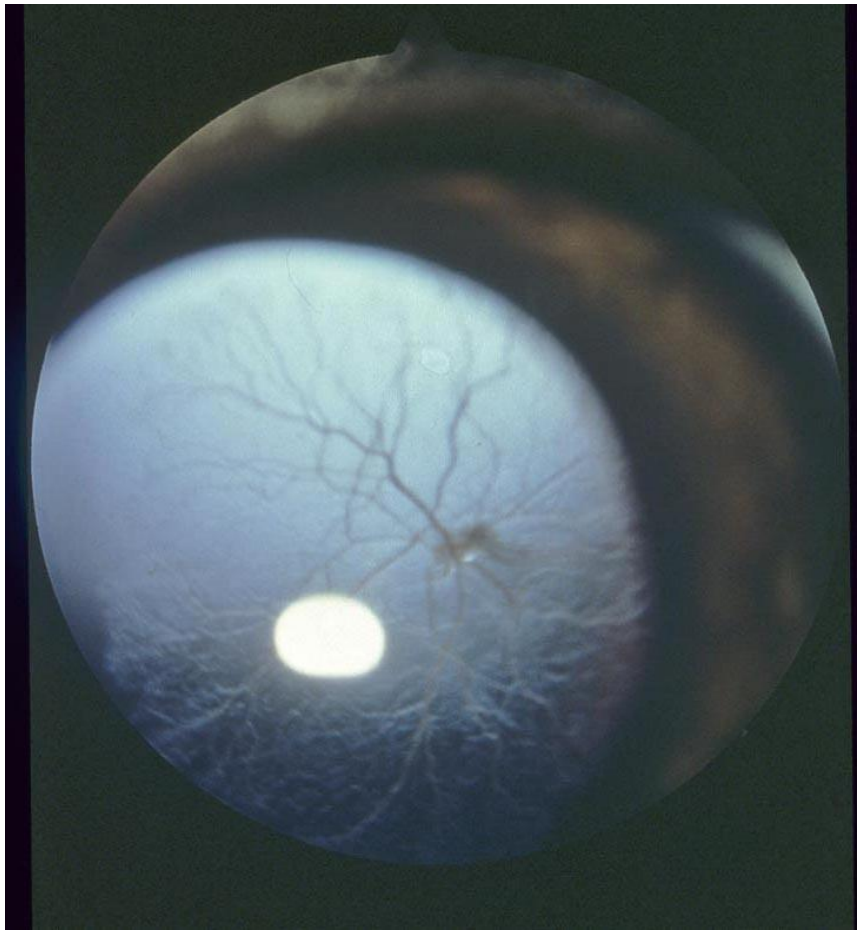
KP-HED; congenital defect resulting from abnormalities in the development and regression of the hyaloid artery. The blood vessel **remnant** can be present **in the vitreous as a small patent vascular strand (PHA) or as a non-vascular strand that appears grey-white** (persistent hyaloid remnant).

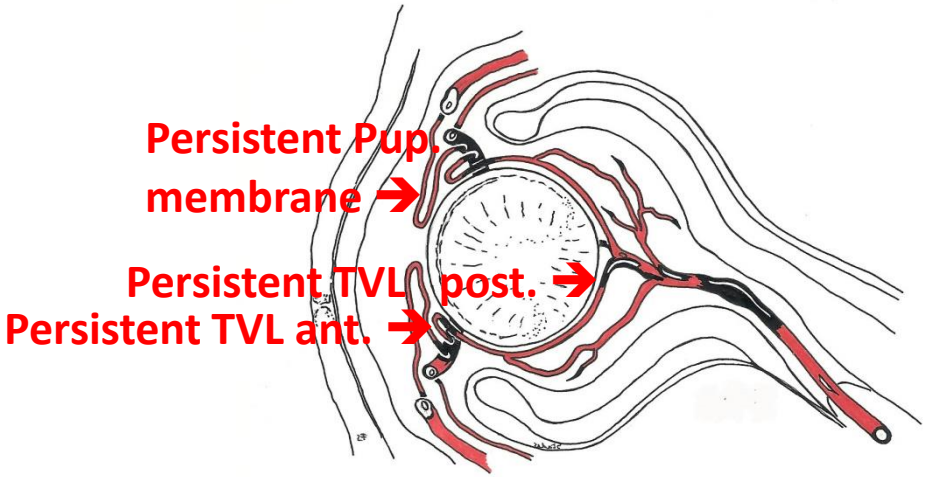
Persistent hyaloid artery (PHA)

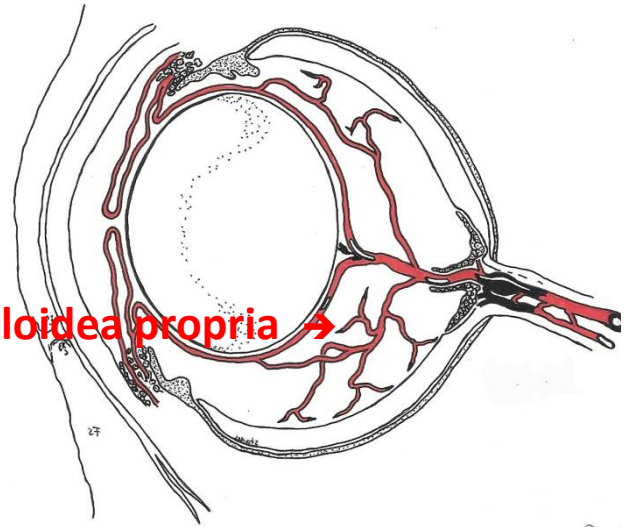
If the PHA is **distinctly visible** by the **naked eye** (thus not only by microscope) in retro illumination, at number **“7. Other”**: “Persistent hyaloid artery” (PHA) is Ticked.

Only if there is a Mittendorf’s dot with signs of capsular cataract that goes beyond the insertion of the PHA and/or a Bergmeister papilla with a **patent vascular or non-vascular fibrous strand** in between them, at number “7”. Other: “Persistent hyaloid artery” is used (on paper: written) and the box “affected” plus the box: **“severe”** in the comment area are ticked.

HED SESSION




Persistent Pup. membrane
Persistent TVL post.
Persistent TVL ant.


Vasa hyaloidea propria

HED SESSION – Kahoot!

Case 12

Brit. Shorthair, 2 y, OS before dilation Slide: FS

OS

Brit. Shorthair, 2 y, OS before dilation Slide: FS

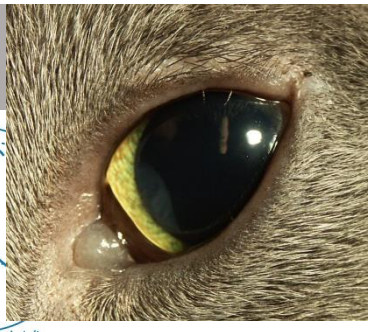
▲ 7. Other: iris coloboma, 13. Distichiasis/Ect. Cilia; 13. severe

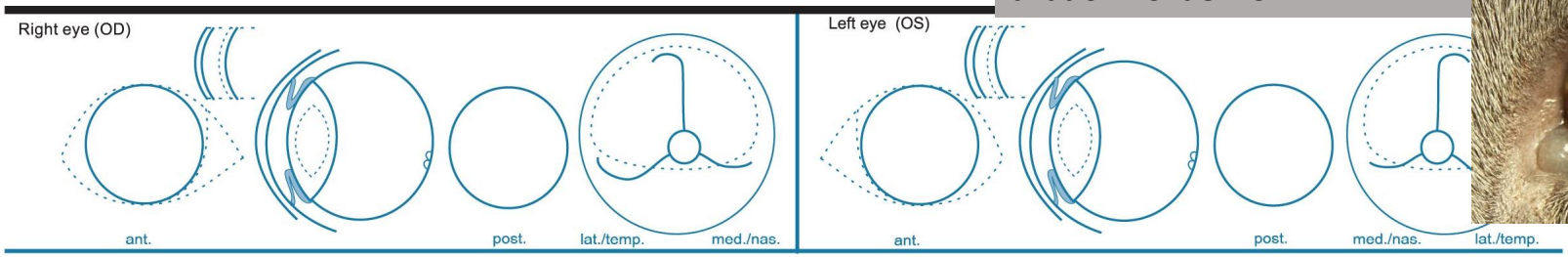
◆ 13. Distichiasis/Ect. Cilia

● 13. Distichiasis/Ect.cilia; comm: 2 Hairs

■ 7. other: aniridy; 7. severe

Brit. Shorthair, 2 y, OS before dilation Slide: FS





Descriptive comments:

13. Ectopic cilia

Eye disease no. ..... ☐ severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	X		☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	X		☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	X		
4. Retinal Dysplasia (RD)	X		☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	X		
6. Collie Eye Anomaly (CEA)	X		☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	X		
8. IridoCorneal Angle Abnormality. (ICAA)			☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	X		
12. Ectropion / Macroblepharon	X		
13. Distichiasis / Ectopic cilia			X
14. Corneal dystrophy	X		
15. Cataract (later onset)	X		☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	X		
17. Retinal degeneration (PRA)	X		
18. Other:	X		

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

Distichiasis:

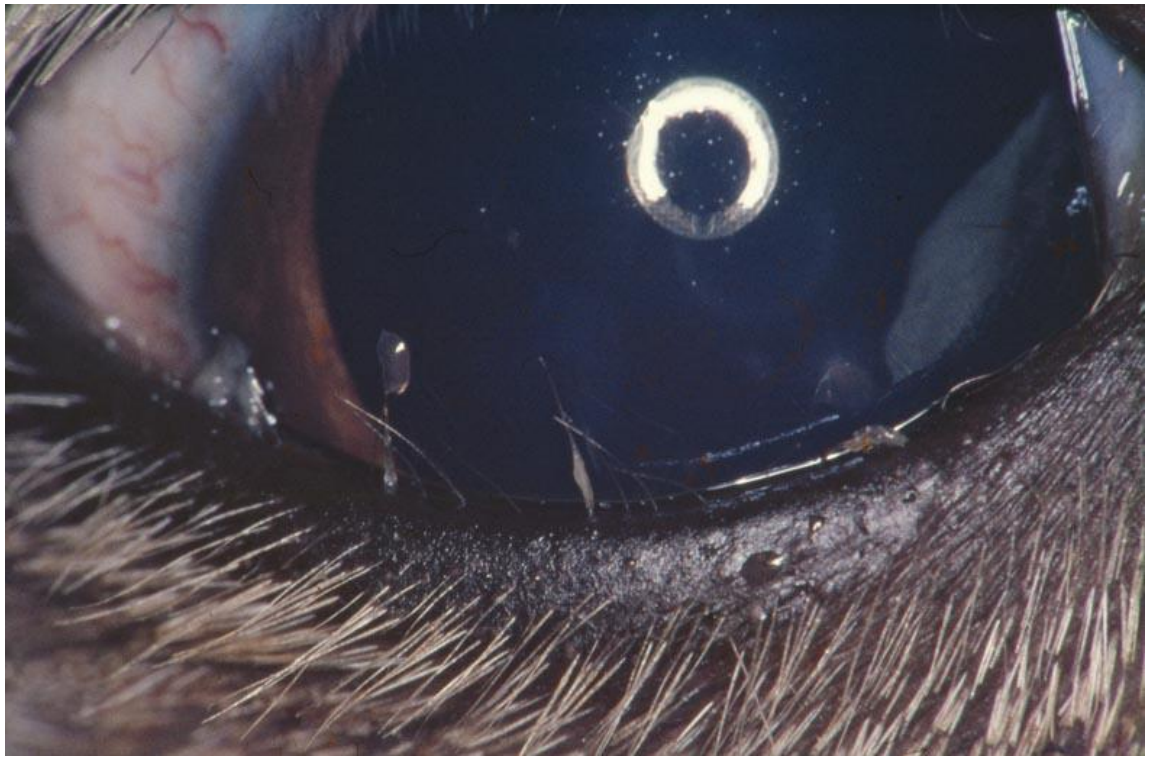
KP-HED; single or multiple hairs (cilia) from an abnormally located hair follicle in the eyelid margin, usually growing from or in between the Meibomian glands, and arising from the Meibomian duct openings, which may cause ocular irritation. The defect is due to abnormal differentiation of a tarsal gland. Distichiasis usually occurs at an early age (< 1-2 years), but may occur any time in life.

Distichiasis/ectopic cilia:

Single or multiple hairs (cilia) from an abnormally located hair follicle in the eyelid margin, usually growing from or in between the Meibomian glands, and arising from the Meibomian duct openings, or emerging through the eyelid conjunctiva which may cause ocular irritation. The defect is due to abnormal differentiation of a tarsal gland. Distichiasis usually occurs at an early age (< 1-2 years), but may occur any time in life.

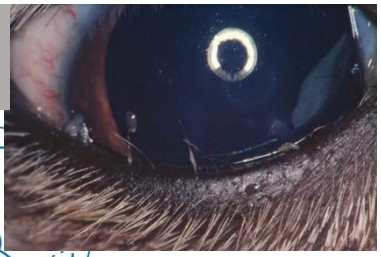
Tick "affected" at "13. Distichiasis/Ectopic cilia". No further details, such as e.g. mentioning the number of hairs, are to be written on the form. Ectopic cilia can be noted in the Descriptive comments field using the drop-down menu.

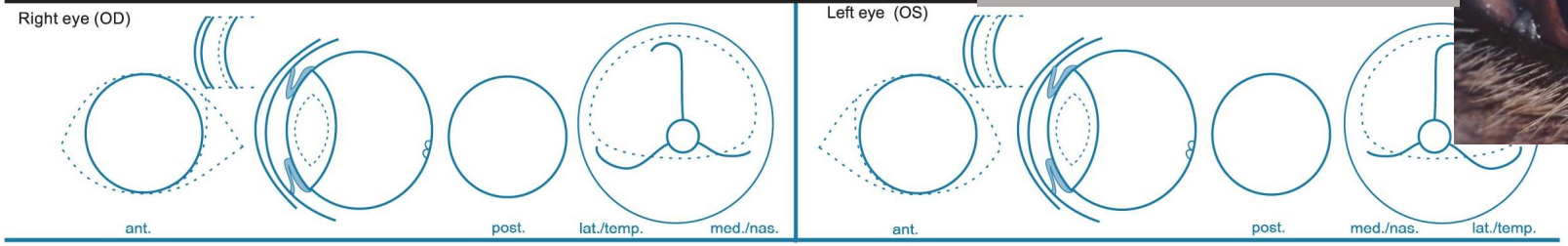
Shetland Sheepdog 9 wks, OS Slide: FS



OD

Shetland Sheepdog 9 wks, OS
Slide: FS





Descriptive comments: .....

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15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Eye disease no. **13.** Distichiasis/Ectopic cilia ☒ severe

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	X		☐ iris ☐ cornea ☐ lens ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	X		☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	X		
4. Retinal Dysplasia (RD)	X		☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	X		
6. Collie Eye Anomaly (CEA)	X		☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	X		
8. IridoCorneal Angle Abnormality. (ICAA)			☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	X		
12. Ectropion / Macroblepharon	X		
13. Distichiasis / Ectopic cilia			X
14. Corneal dystrophy	X		
15. Cataract (later onset)	X	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	X		
17. Retinal degeneration (PRA)	X		
18. Other:	X		

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

Distichiasis/ectopic cilia

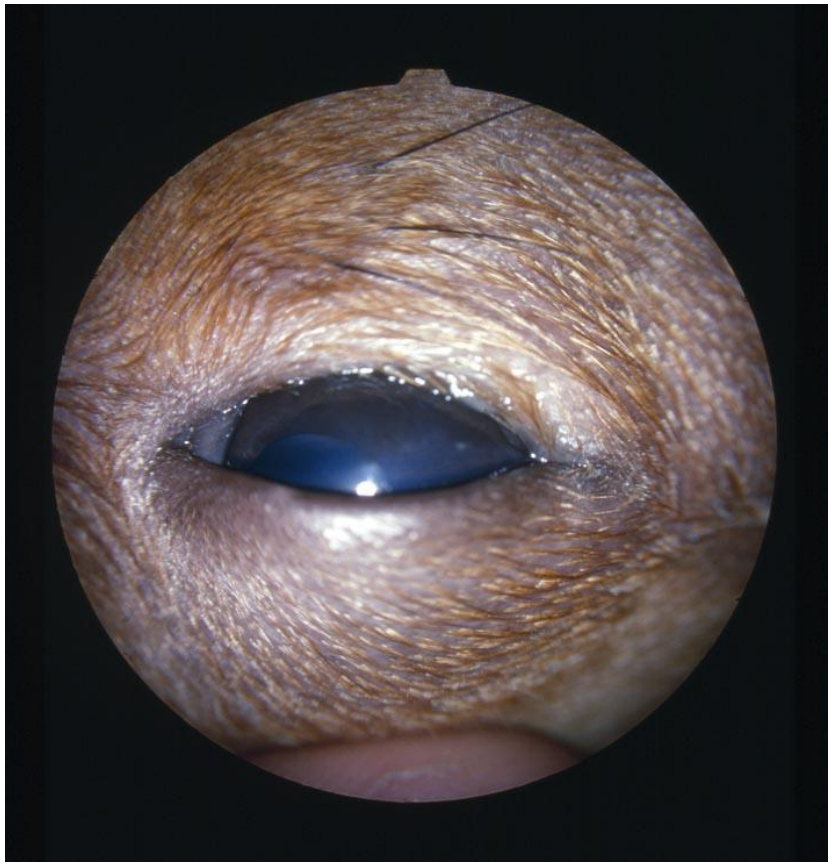
Only if there are **clinical signs of corneal irritation** such as detritus on the distichia, corneal edema, corneal vessels, defects or pigmentation at the location of the distichia, hard stiff distichia and/or ectopic cilia

recognized, also the **box "severe"** is to be ticked in the comment area.

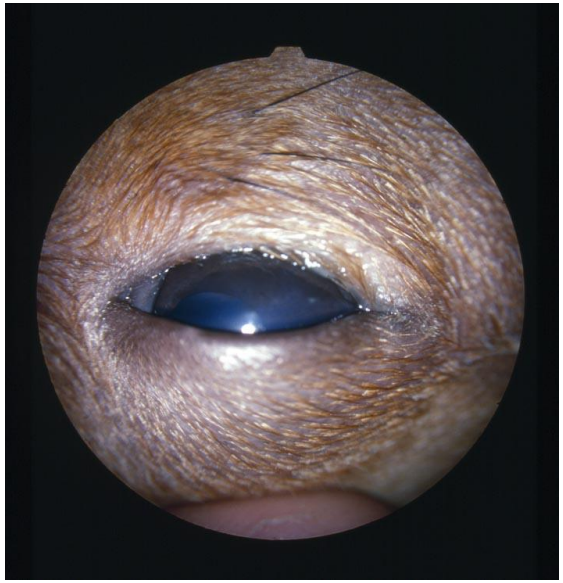
HED SESSION – Kahoot!

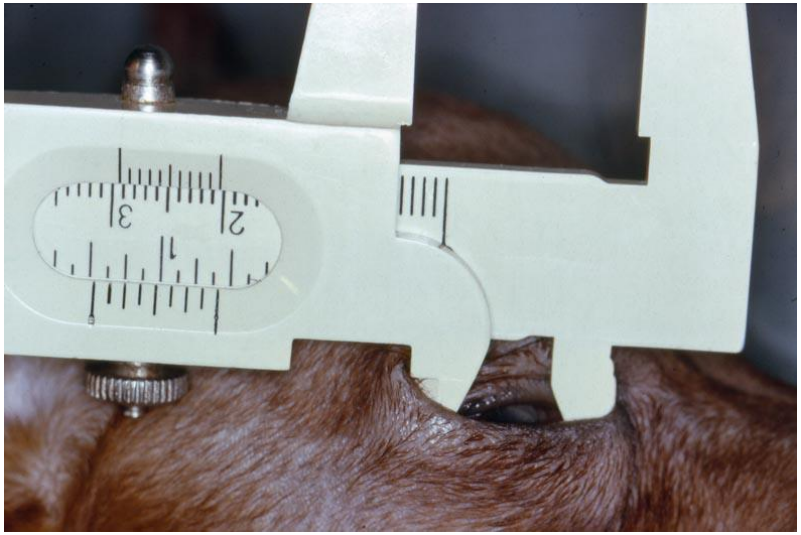
Case 13

Miniature Pinscher, 4 month, M Slide: Frans Stades



Miniature Pinscher, 4 month, M, stretched fissure 19 mm Slide: Frans Stades





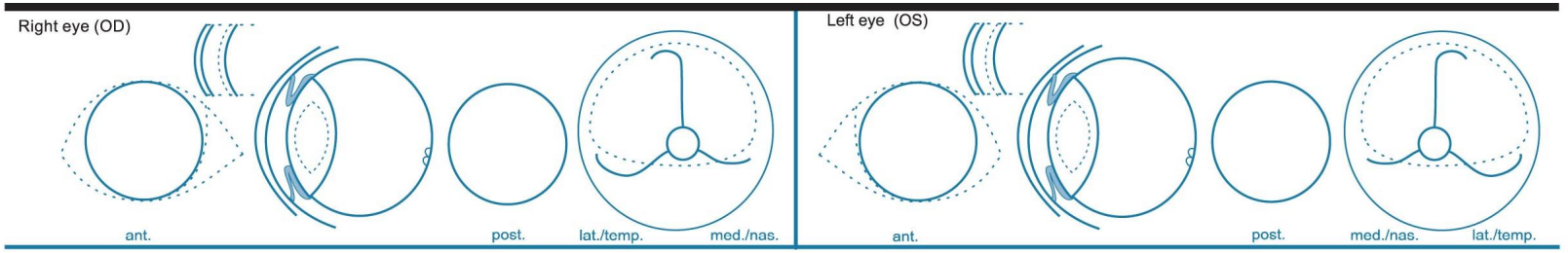
▲ 7. Other: Microblepharon

◆ 7. Other: Microphthalmos

● 11. Entropion/Trichiasis

■ 7. Other: Microblepharon; 7. severe

ECVO



Descriptive comments: .....

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Eye disease no. .....7. Microblepharon..... X severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	X		☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	X		☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	X		
4. Retinal Dysplasia (RD)	X		☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	X		
6. Collie Eye Anomaly (CEA)	X		☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other: Microblepharon			X
8. IridoCorneal Angle Abnormality. (ICAA)			☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	X		
12. Ectropion / Macroblepharon	X		
13. Distichiasis / Ectopic cilia	X		
14. Corneal dystrophy	X		
15. Cataract (later onset)	X		☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	X		
17. Retinal degeneration (PRA)	X		
18. Other:	X		

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

Microblepharon:

KP-HED; an exceptionally short palpebral fissure. Microblepharon may lead to upper lid entropion and trichiasis.

Microblepharon

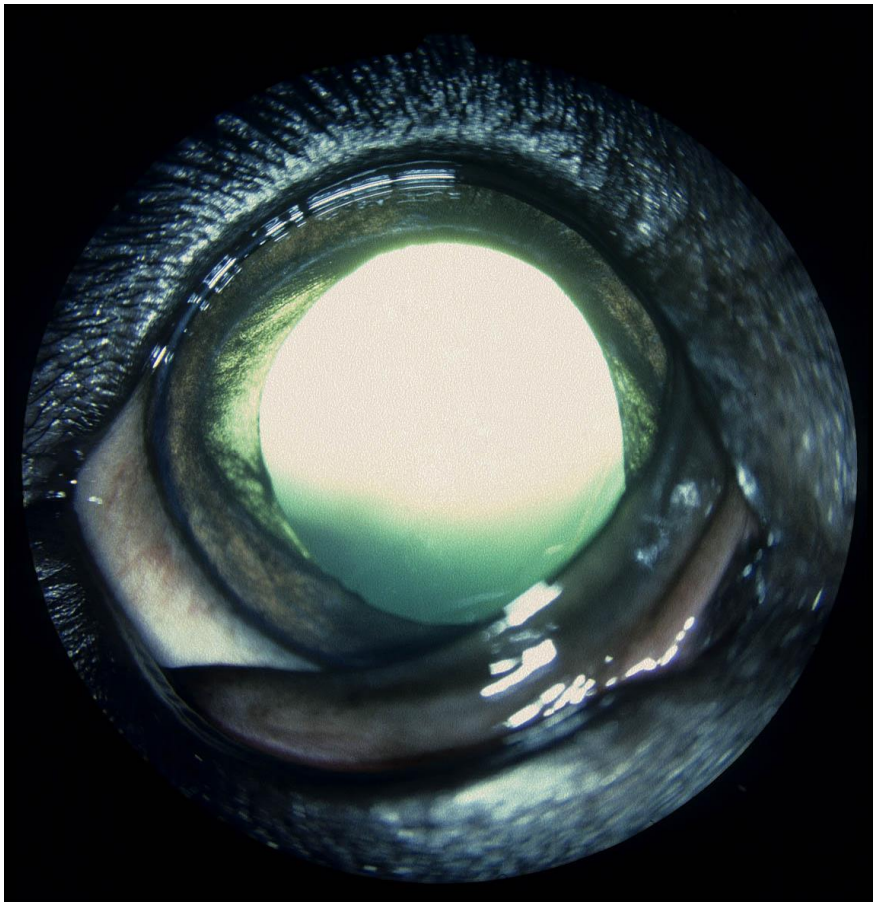
If the lid fissure in an adult dog is smaller compared to dogs of the same breed, at “7. Other”: “Microblepharon” is written (online: is used), and the box “affected” is ticked.

Only if a uni- or bilateral microblepharon is diagnosed usually combined with a **severe upper lid entropion**, also the box “**severe**” is to be ticked in the comment area.

HED SESSION – Kahoot!

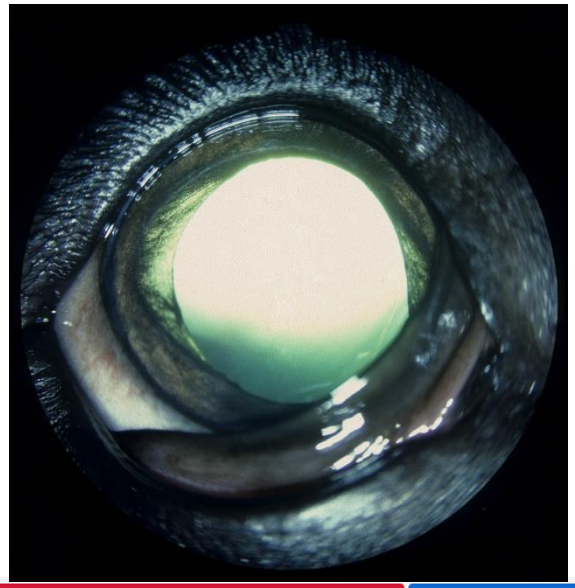
Case 14

Rottweiler, 1.5 Y, m, OD, unilateral, before mydriasis slide: FS



OD

Rottweiler, 1.5 y, m, OD, unilateral, before mydriasis
slide: FS



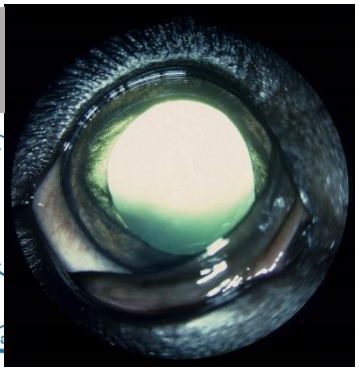
▲ 7. Iris hypoplasia; 7. severe; Comm: iris thinning

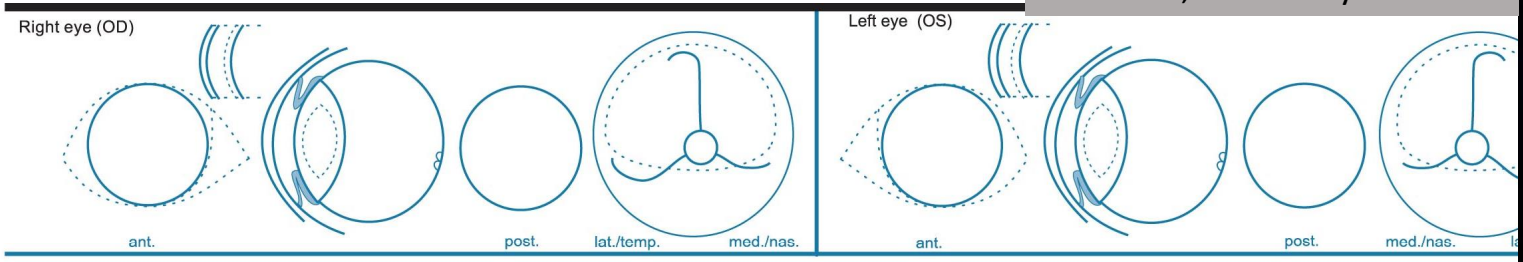
◆ 7. Other: iris hypoplasia

● 7. Other: aniridy- severe

■ Comment: Iris atrophy

Rottweiler, 1.5 y, m, OD, unilateral, before mydriasis





Descriptive comments: .....

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.....

Eye disease no. **7. Iris hypoplasia** ..... [X] severe

15. Other lens opacity: [ ] punctata; [ ] suture line tip; [ ] suture line; [ ] nuclear ring; [ ] nuclear fiberglass/pulverulent

8. ICAA: PLA [ ] mild; [ ] moderate; [ ] severe

ICA (width) [ ] narrow (moderate); [ ] closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	[X]	[ ]	[ ] iris [ ] lens [ ] cornea [ ] lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	[X]	[ ]	[ ] grade 1 [ ] grade 2-6
3. Cataract (congenital)	[X]	[ ]	[ ]
4. Retinal Dysplasia (RD)	[X]	[ ]	[ ] (multi)focal [ ] geographical [ ] total
5. Hypoplastic-/Micro-papilla	[X]	[ ]	[ ]
6. Collie Eye Anomaly (CEA)	[X]	[ ]	[ ] choroid. hypoplasia [ ] coloboma [ ] other:
7. Other: **Iris hypoplasia**	[ ]	[ ]	[X]
8. IridoCorneal Angle Abnormality. (ICAA)	[ ]		[ ] mild [ ] moderate [ ] severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	[X]	[ ]	[ ]
12. Ectropion / Macroblepharon	[X]	[ ]	[ ]
13. Distichiasis / Ectopic cilia	[X]	[ ]	[ ]
14. Corneal dystrophy	[X]	[ ]	[ ]
15. Cataract (later onset)	[X]	[ ]	[ ] cortical [ ] post. pol. [ ] nuclear [ ] other lens opacity
16. Lens luxation (primary)	[X]	[ ]	[ ]
17. Retinal degeneration (PRA)	[X]	[ ]	[ ]
18. Other:	[X]	[ ]	[ ]

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
"Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

HED Manual Chapter 5 Definitions:

Hypoplasia iris:

KP-HED; characterized by congenital **thinning and/or absence** of iris (sphincter) tissue **or colobomatous** defects due to failure in closure of the optic fissure. It may be a separate disorder or associated with other ocular malformations. See and use iris hypoplasia.

Iris hypoplasia

Congenital, uni- or bilateral thinning and/or absence of iris (sphincter) tissue or colobomatous defects due to failure in closure of the optic fissure.

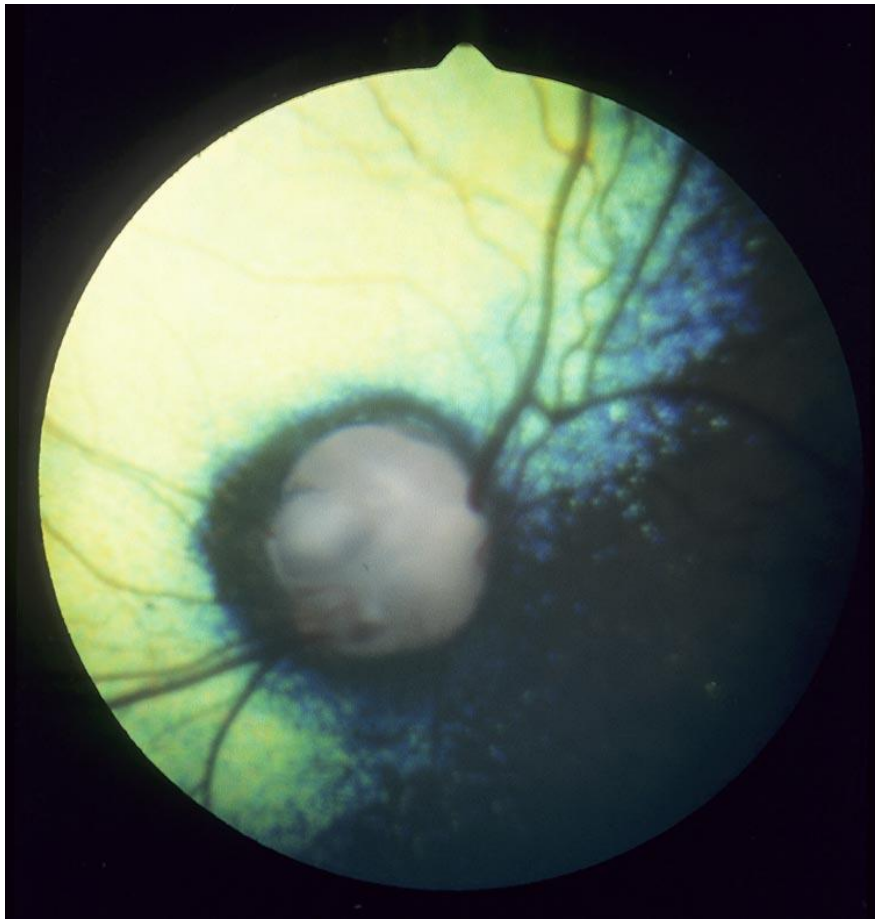
At **"7. Other": "Iris hypoplasia"** is written (online: is used), and the box "affected" is ticked.

Only if uni- or bilateral iris tissue is missing (full thickness) or failed to develop (developmentally colobomatous) also the box "severe" is to be ticked in the comment area

HED SESSION – Kahoot!

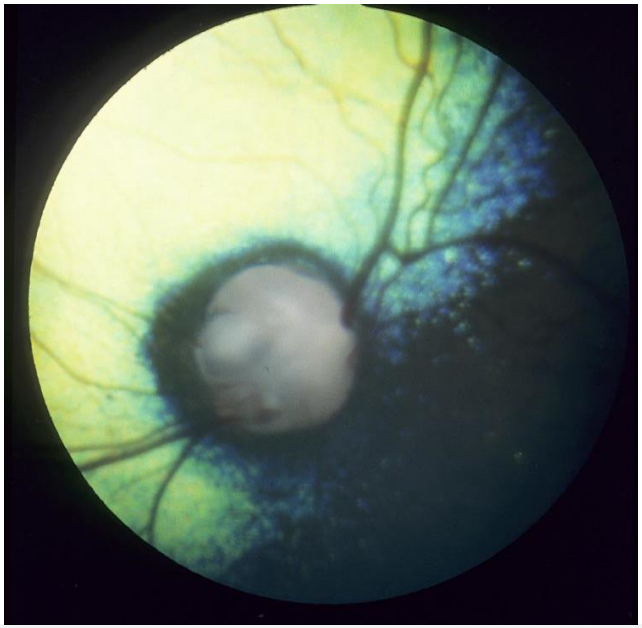
Case 15

Persian cat, 7 months, OS, Slide: FS



OS

Persian cat, 7 months, OS, Slide: FS



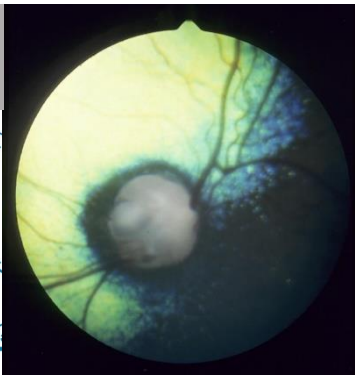
▲ 5. Hypoplastic-/Micropapilla

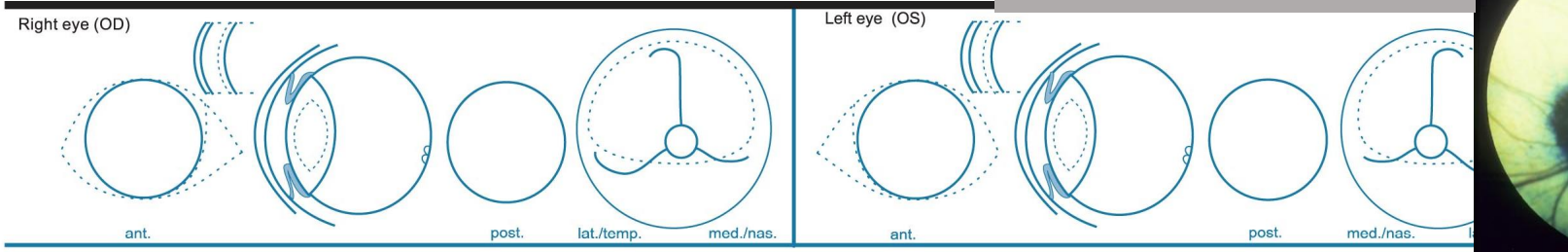
◆ 7. Optic disc coloboma

● Comments: (Chorio-) retinopathy, inheritance under investigation

■ 7. Optic nerve head hypoplasia

Persian cat, 7 months, OS,
Slide: FS





Descriptive comments: .....

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.....

Eye disease no. ..... ☐ severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	X		☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	X		☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	X		
4. Retinal Dysplasia (RD)	X		☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	X		
6. Collie Eye Anomaly (CEA)	X		☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other: Optic Disc (Nerve head): Coloboma			X
8. IridoCorneal Angle Abnormality. (ICAA)			☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	X		
12. Ectropion / Macroblepharon	X		
13. Distichiasis / Ectopic cilia	X		
14. Corneal dystrophy	X		
15. Cataract (later onset)	X		☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	X		
17. Retinal degeneration (PRA)	X		
18. Other:	X		

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

HED Manual Chapter 5 Definitions

Optic papilla/optic disc/optic nerve head: the part of the optic nerve which is visible, by ophthalmoscopic examination, in the fundus.

Optic nerve head hypoplasia: see and use hypoplastic papilla/optic nerve head/disc.

Hypoplasia-/ optic nerve head/disc hypoplasia:

KP-HED; congenital failure of development of the optic nerve which causes visual deficit or blindness and abnormal pupil response in the affected eye. It can often not be differentiated from micropapilla on a routine (dilated) ECVO eye examination

Other 7. Optic “disc”/Optic nerve head coloboma

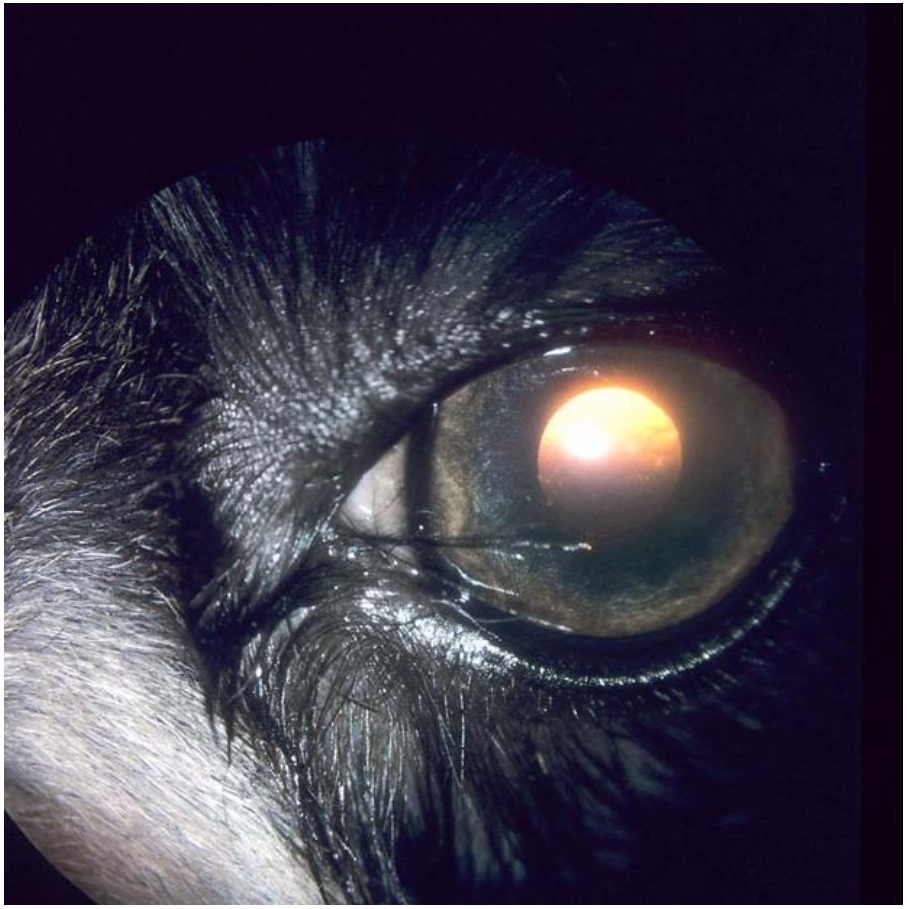
Note: If there is a congenital lack of tissue in the iris and lens, the term "hypoplasia" is used: iris hypoplasia, lens hypoplasia. Reason: Iris tissue can be absent in full-thickness, but also only partially (hypoplastic); The lens equator may have a flattened curvature due to abnormal development of zonular fibers or ciliary processes.

For congenital absence of tissue of the eyelid, retina, choroidea, sclera or optic nerve/papilla use the term “coloboma” e.g., eyelid coloboma, retinal coloboma, choroidal coloboma, scleral coloboma and/or optic nerve coloboma

HED SESSION – Kahoot!

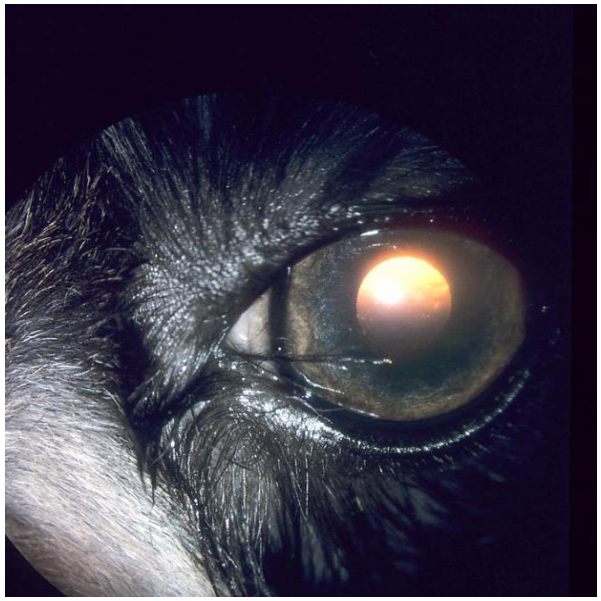
Case 16

Boomer, 2 years, OS Slide: Frans Stades



Boomer, 2 years, OS

Slide: Frans Stades



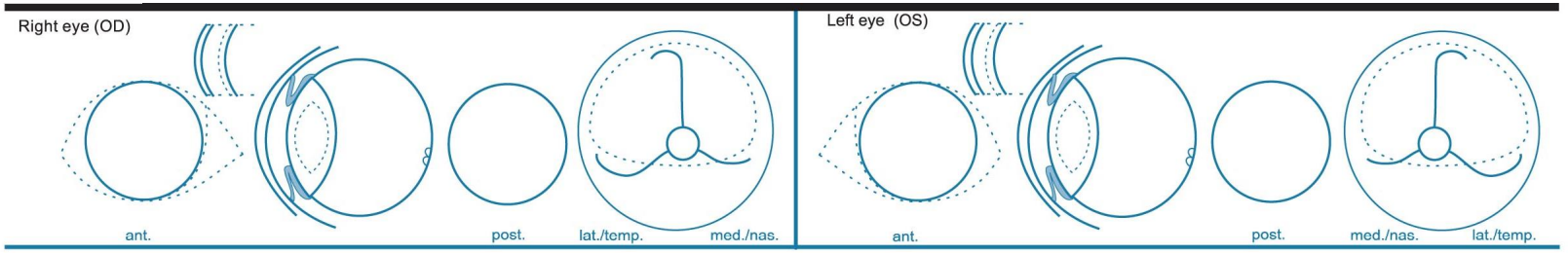
▲ 13. Distichiasis/ Ectopic cila

◆ 11: Entropion/Trichiasis. Comm: 11 Trichiasis nasal fold.

● 11. Entrop./ Tri; 11.severe Comm: 11. Entrop. nasal + 11. Tri. nasal/nasal fold

■ 11: Entrop./Trichiasis. Comm: 11 Entrop. Nasal + other: Tri. caruncle

ECVO



Descriptive comments: **11. Entropion nasal**

11. Trichiasis nasal/nasal fold

Eye disease no. **11. Ent/Tri** ☒ severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	☒	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☒	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☒	☐	☐
4. Retinal Dysplasia (RD)	☒	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☒	☐	☐
6. Collie Eye Anomaly (CEA)	☒	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	☒	☐	☐
8. IridoCorneal Angle Abnormality. (ICAA)	☐		☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	☐	☐	☒
12. Ectropion / Macroblepharon	☒	☐	☐
13. Distichiasis / Ectopic cilia	☒	☐	☐
14. Corneal dystrophy	☒	☐	☐
15. Cataract (later onset)	☒	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	☒	☐	☐
17. Retinal degeneration (PRA)	☒	☐	☐
18. Other:	☒	☐	☐

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
"Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

Entropion:

KP-HED; a conformational defect resulting in **"in-rolling"** of one or both of the margins of the eyelids which may cause ocular irritation. It is likely that entropion is influenced by several genes (**polygenic**), defining the skin and other structures which make up the eyelids, the amount and weight of the skin covering the head and face, the orbital contents and the conformation of the skull.

Trichiasis:

KP-HED or acquired abnormality of **deviated** hairs on a **normal place** around the lid fissure, irritating the conjunctiva, the free lid margin of the opposite lid and/or the conjunctiva and/or the globe. It is predominantly due to facial folds or due to misalignment of the eyelids.

Entropion/trichiasis

Tick “affected” at “11. Entropion/Trichiasis”. The entropion or trichiasis **localisation** can be specified using the drop-down menu (text) in the Descriptive comments field:

- 11. Trichiasis nasal/nasal fold
- 11. Trichiasis upper eyelid temporal

No further details are to be mentioned on the form

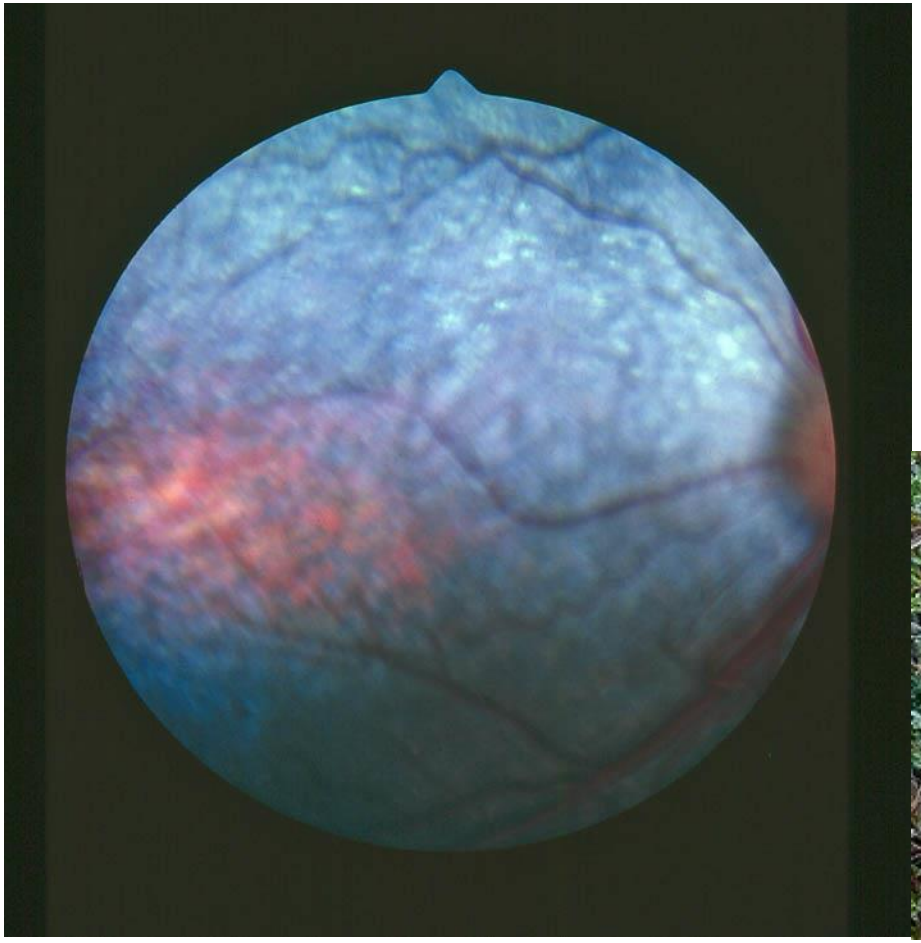
Entropion/trichiasis

Only if there are distinct clinical signs of **corneal irritation** such as detritus on the lid hairs, corneal edema, corneal vessels, defects or pigmentation at the location of the entropionised lid margin, also the box "**severe**" is to be ticked in the comment area.

HED SESSION – Kahoot!

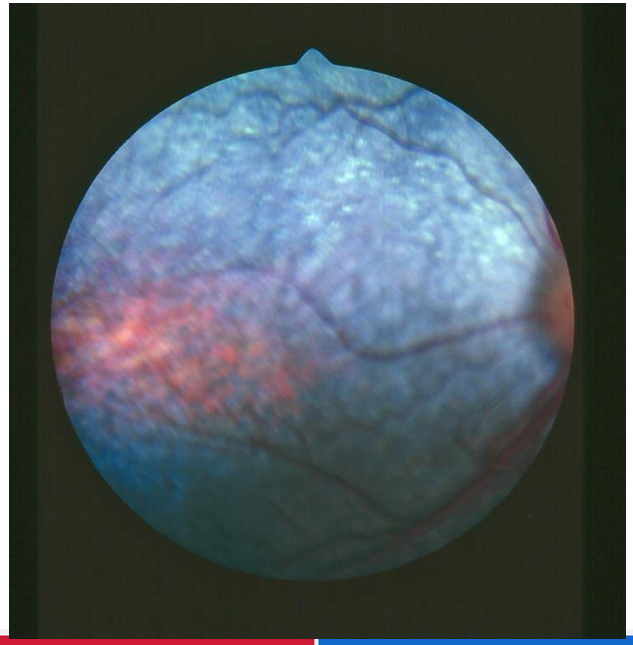
Case 17

Boykin Spaniel 9 wks, bilateral Slide: FS



OS

Boykin Spaniel 9 wks, bilateral Slide: FS



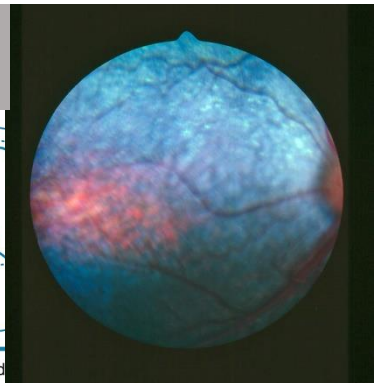
▲ 6. Collie Eye Anomaly - Choroid. Hypoplasia

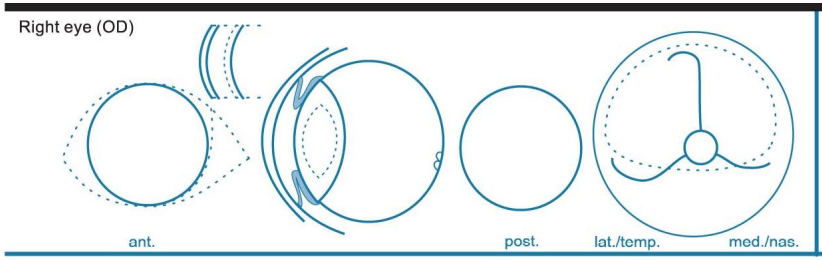
◆ 7. Other: Choroid. Hypoplasia - “go normal”

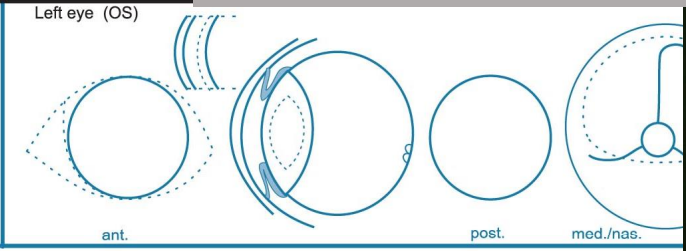
● Comments: (Chorio-) retinopathy, inheritance under investigation

■ 6. Collie Eye Anomaly - unaffected

Boykin Spaniel 9 wks, bilateral
Slide: FS







Descriptive comments: .....

.....

.....

Eye disease no. ..... ☐ severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	X		☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	X		☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	X		
4. Retinal Dysplasia (RD)	X		☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	X		
6. Collie Eye Anomaly (CEA)			X ☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	X		
8. IridoCorneal Angle Abnormality. (ICAA)			☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	X		
12. Ectropion / Macroblepharon	X		
13. Distichiasis / Ectopic cilia	X		
14. Corneal dystrophy	X		
15. Cataract (later onset)	X		☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	X		
17. Retinal degeneration (PRA)	X		
18. Other:	X		

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

Choroidal (retinal) hypo- (dys-) plasia (CH, CRD):

KP-HED congenital eye disease which is characterized by inadequate development of the choroid present at birth which is non-progressive.

Most commonly identified in the Collie breed where it is a manifestation of “Collie Eye Anomaly” but can also be seen in other breeds.

Collie Eye Anomaly (CEA):

KP-HED; a congenital syndrome of ocular anomalies originally described in Collie breeds (short hair, long hair, Border Collie, Bearded Collie) and Shetland sheepdog affecting the choroid and sclera and indirectly the retina and optic disc. It is characterized by bilateral and often symmetrical defects including choroidal hypoplasia (CH or CRD) with or without coloboma, retinal detachment and intraocular haemorrhage. Vision varies with the degree to which an individual is affected and may be minimally compromised to having severe visual impairment or blindness.

Collie eye anomaly is to be ticked “affected” at “6. CEA” in the following breeds known to have CEA (genetic test available):

Australian Kelpie, Australian Shepherd, Bearded Collie, Border Collie, Boykin Spaniel, Collie (short hair, long hair), Hokkaido, Lancashire Heeler, Miniature American Shepherd, Nova Scotia Duck Tolling Retriever, Shetland Sheepdog (Sheltie), Silken Windhound, Silken Windsprite.

In cases where the animal displays clinical features that could possibly fit this KP-HED, but the changes are not specific enough, the result of the examination is: “undetermined”.

In dogs of a relevant breed that were not examined until after the 8th week of age, CEA can be masked (“**go normal**”) later in life. In such cases the breeder/owner is advised to distinguish the status of the animal by e.g. DNA testing. The box “affected” and one of the specifying boxes have to be ticked.

If the box “other” is applicable, this has to be specified using in the comment area the drop-down menu “6. CEA: other: retinal detachment, haemorrhage”.

HED Manual Chapter 6. Guidelines:

Choroidal hypoplasia (CH) [or chorioretinal dysplasia (CRD)] CH/CRD resembling CEA but **seen in breeds other than those listed under "Collie eye anomaly (CEA)": At number "7. Other:** Choroidal hypoplasia" is written (online: is used), and the box affected is ticked.

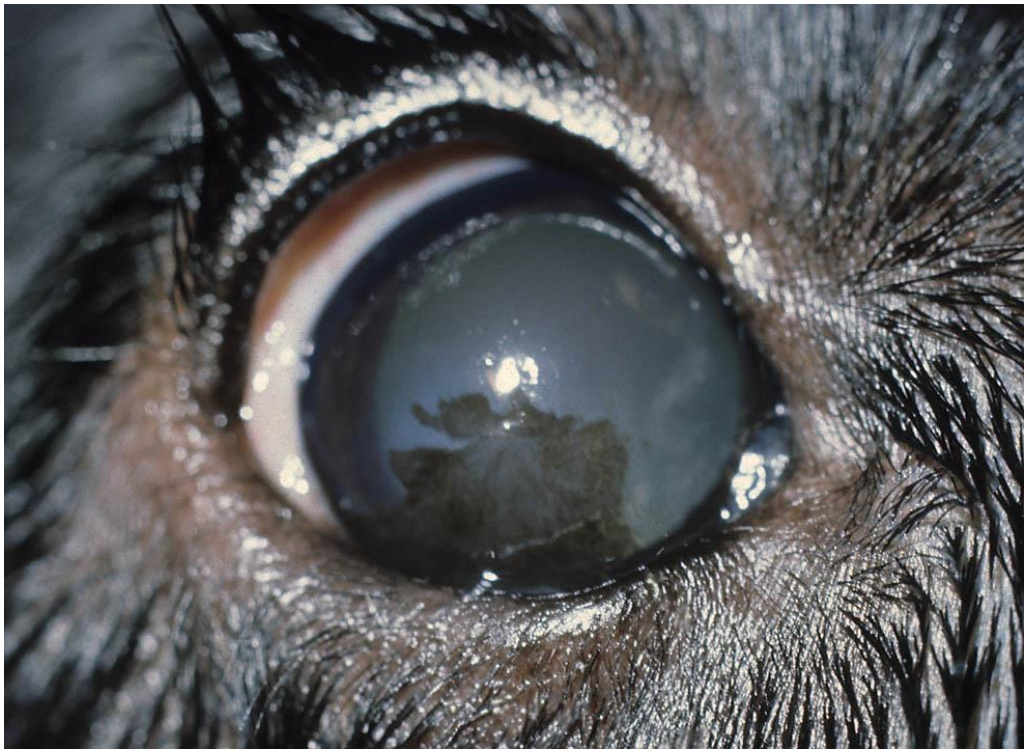
In cases where the clinical features which could possibly fit this entity, but the changes are not specific enough, the result of the examination is: "undetermined".

In dogs of a relevant breed that were not examined until after the 8th week of age, CEA can be masked ("go normal") later in life.

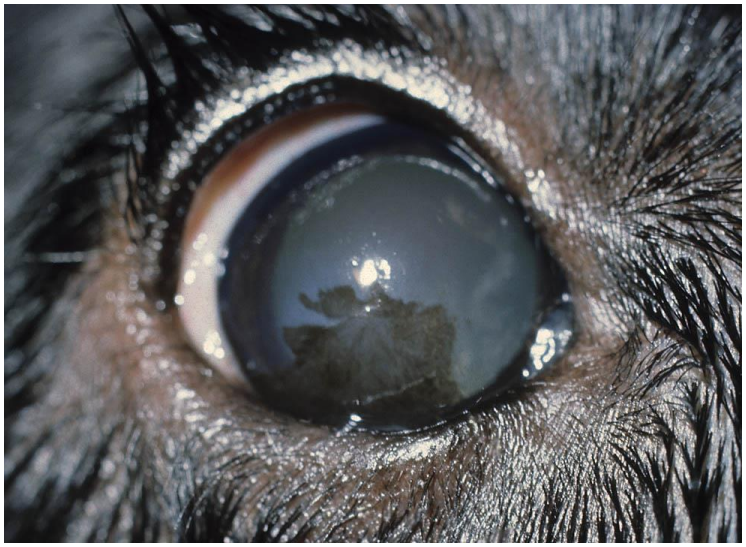
HED SESSION – Kahoot!

Case 18

Tervueren Shepherd, 1 y, OU Slide: Frans Stades

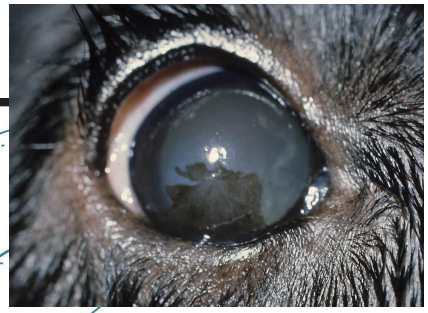


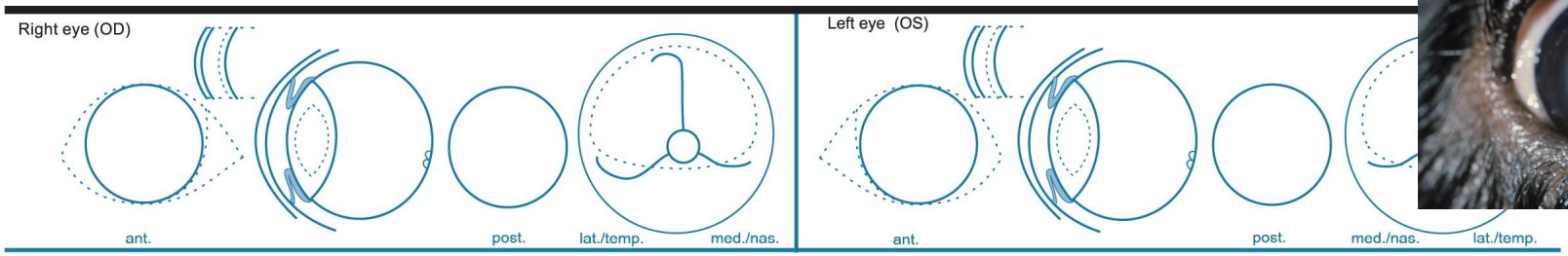
Tervueren Shepherd, 1 y, OU Slide: Frans Stades



▲ 18. Other: Keratitis, chronic superficial (CSK)/Pannus	◆ 11. Entropion/Trichiasis; 11. severe
● 11. Entropion/Trichiasis	■ 18. Other: Keratitis, chronic superficial (CSK)/Pannus; 18. severe

ECVO





Descriptive comments: .....

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.....

Eye disease no. ..... 11. Ent/Tri ..... ☒ severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	☒	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☒	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☒	☐	☐
4. Retinal Dysplasia (RD)	☒	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☒	☐	☐
6. Collie Eye Anomaly (CEA)	☒	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	☒	☐	☐
8. IridoCorneal Angle Abnormality. (ICAA)	☐		☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	☐	☐	☒
12. Ectropion / Macroblepharon	☒	☐	☐
13. Distichiasis / Ectopic cilia	☒	☐	☐
14. Corneal dystrophy	☒	☐	☐
15. Cataract (later onset)	☒	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	☒	☐	☐
17. Retinal degeneration (PRA)	☒	☐	☐
18. Other:	☒	☐	☐

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

HED Manual Chapter 5 Definitions

Entropion:

KP-HED; a conformational defect resulting in "in-rolling" of one or both of the margins of the eyelids which may cause ocular irritation. It is likely that entropion is influenced by several genes (polygenic), defining the skin and other structures which make up the eyelids, the amount and weight of the skin covering the head and face, the orbital contents and the conformation of the skull.

HED Manual Chapter 6 Guidelines

Entropion/trichiasis

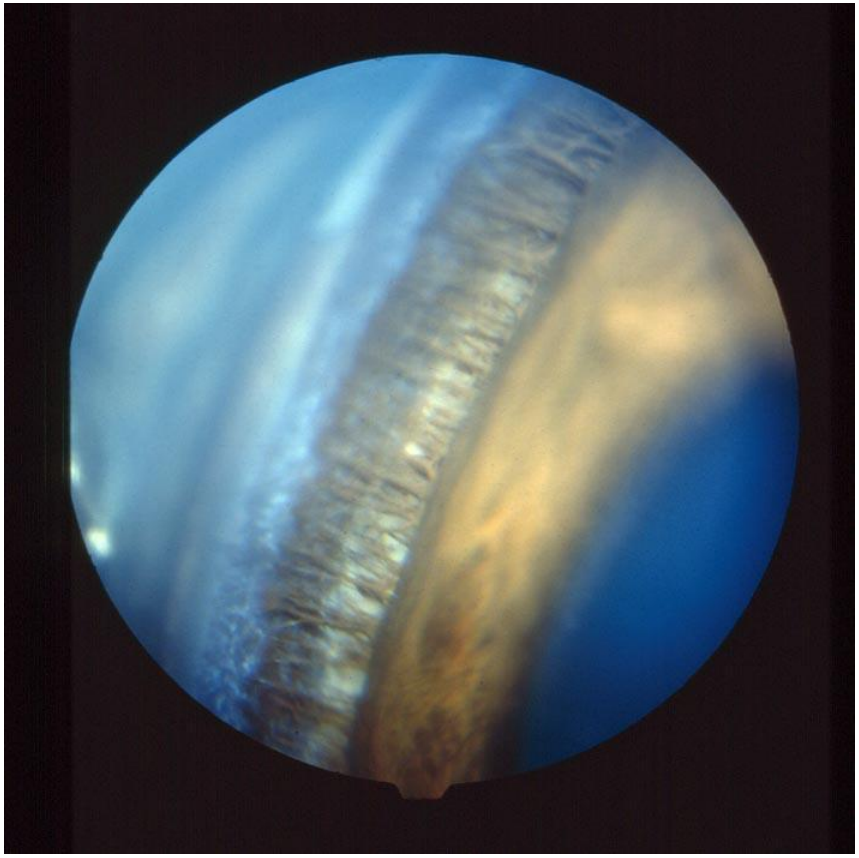
Tick “affected” at “11. Entropion/Trichiasis”. The entropion or trichiasis localisation can be specified using the drop-down menu (text) in the Descriptive comments field. No further details are to be mentioned on the form.

Only if there are distinct **clinical signs of corneal irritation** such as detritus on the lid hairs, corneal edema, corneal vessels, defects or pigmentation at the location of the entropionised lid margin, also the box **“severe”** is to be ticked in the comment area.

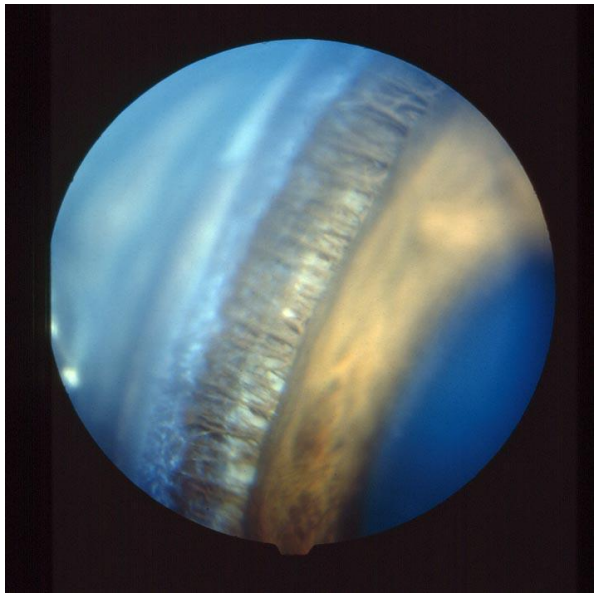
HED SESSION – Kahoot!

Case 19

Vizsla, 2y, gonioscopy Slide: Frans Stades



Vizsla, 2 years, gonioscopy Slide: Frans Stades

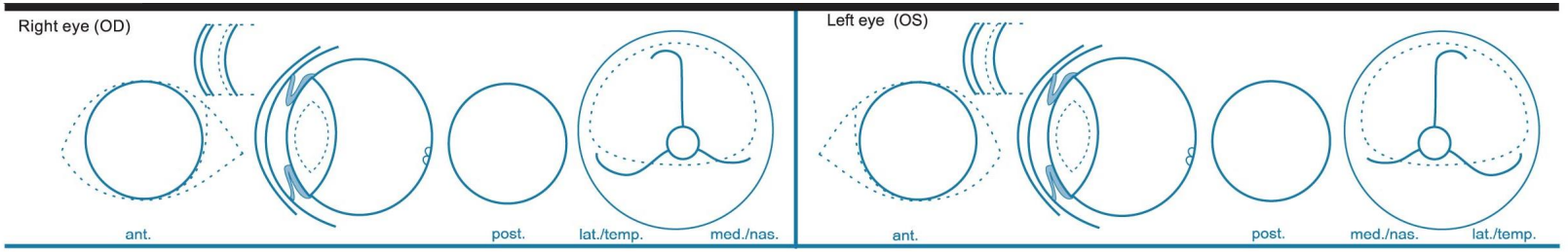


▲ 8. ICAA: mild PLA: Unaff. ICA: narrow.

◆ 8. ICAA: unaff. PLA: unaff. + ICA: unaff.

● 8. ICAA: mild PLA: Mild, ICA: Unaff.

■ 8. ICAA: moderate PLA: mild ICA: narrow



Descriptive comments: .....

.....

.....

Eye disease no. ..... ☐ severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	X		☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	X		☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	X		
4. Retinal Dysplasia (RD)	X		☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	X		
6. Collie Eye Anomaly (CEA)	X		☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	X		
8. IridoCorneal Angle Abnormality. (ICAA)	X		☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	X		
12. Ectropion / Macroblepharon	X		
13. Distichiasis / Ectopic cilia	X		
14. Corneal dystrophy	X		
15. Cataract (later onset)	X		☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	X		
17. Retinal degeneration (PRA)	X		
18. Other:	X		

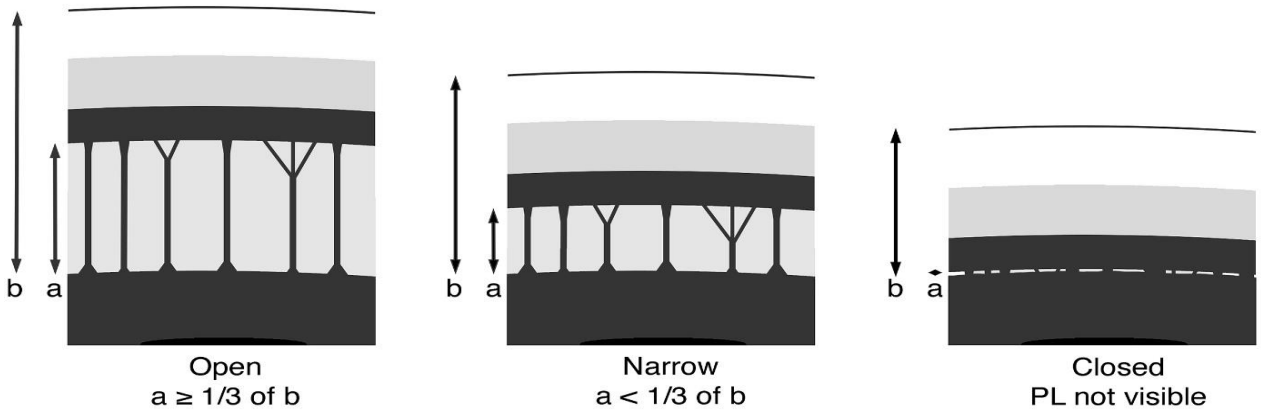
Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

HED Manual Chapter 5 Definitions

Iridocorneal angle (ICA) **width**: the width of the ICA is evaluated (using gonioscopy) by comparison of
the length of the pectinate ligament PL (A) and the distance from the origin of the PL to the anterior
surface of the cornea at the transection area (B);

HED Manual Chapter 5 Definitions



Courtesy and modified by B. Ekesten from Ekesten B, & Narfström K.

Grading of ICA width:

– Open = normal

– Narrow = affected moderate

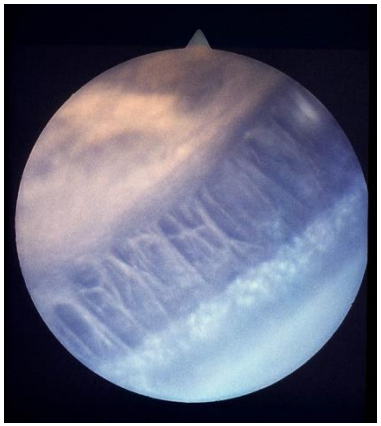
– Closed = affected severe

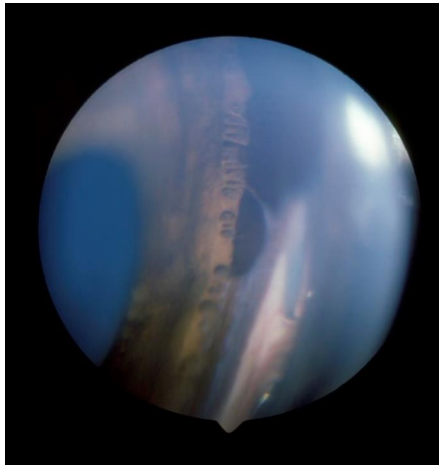
HED Manual Chapter 6 Guidelines

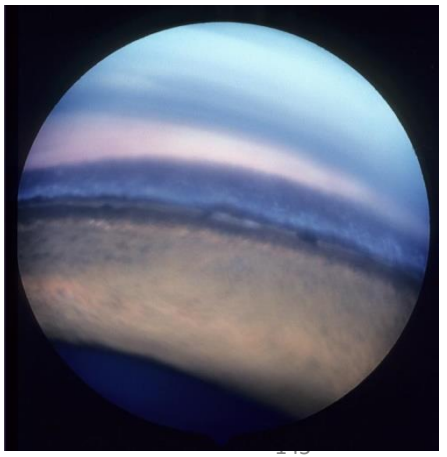
Pectinate Ligament (PL) consists of thin/filamentous fibres from iris base to its insertion at the cornea.

Fibrae latae (FL): fibres with a confluent (broad) base and shortened thin insertions at the cornea or thick fibres (<5 fibres)

Laminae (LA): plates or sheets of continuous tissue (>5 fibres), with or without flow holes



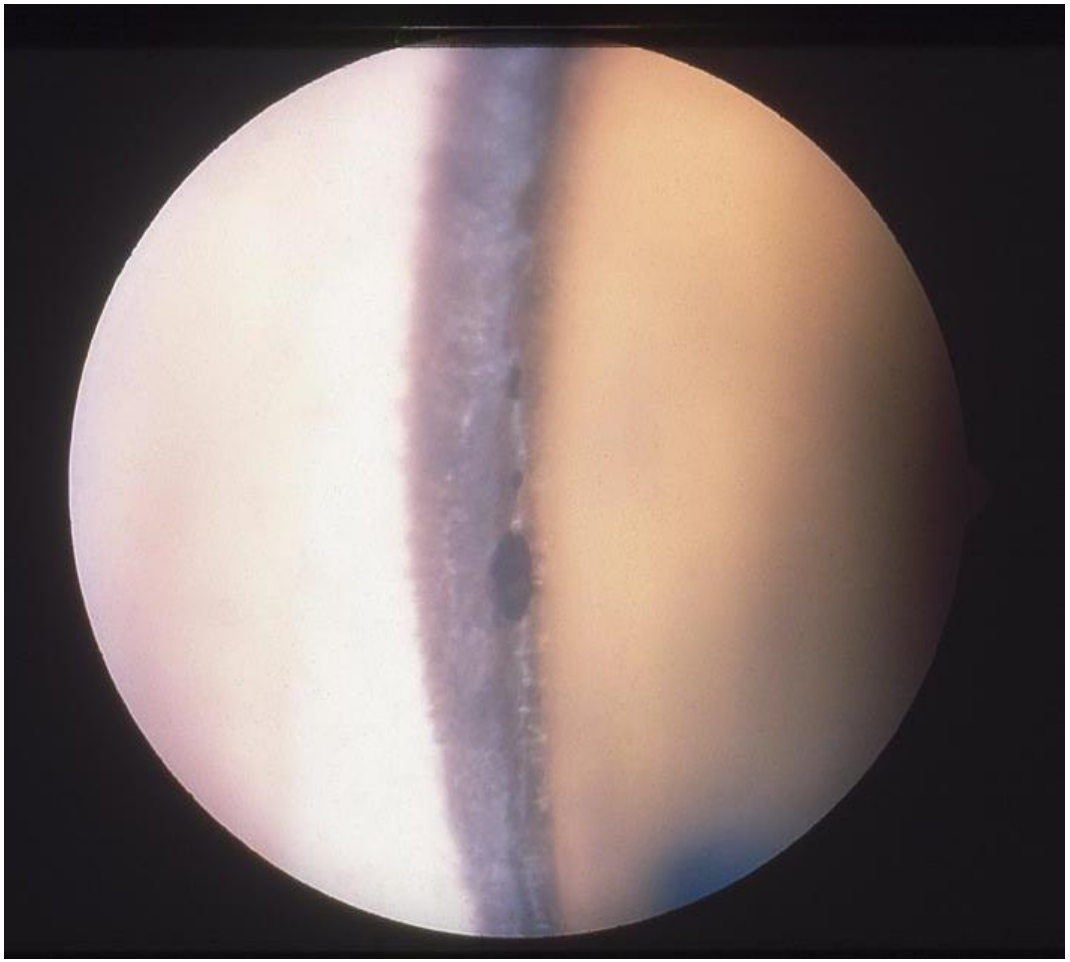




HED SESSION – Kahoot

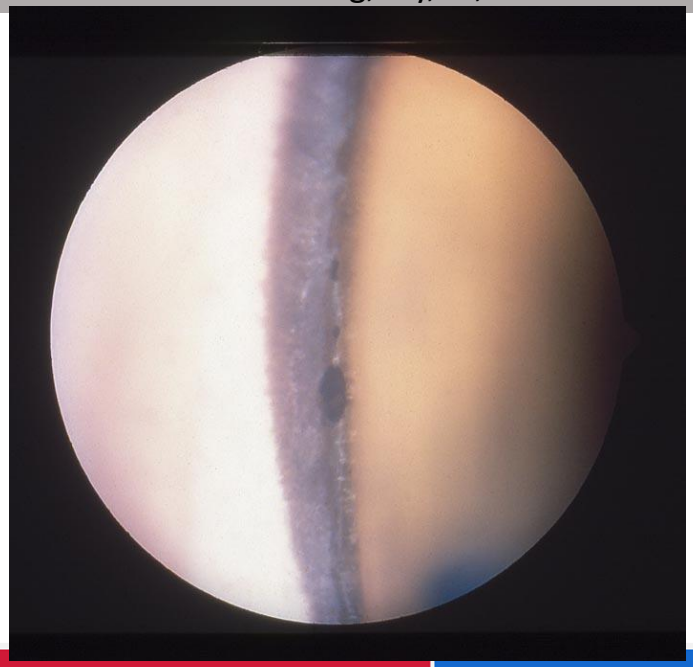
Case 20

Entlebucher Sennendog, 5 y, m, OS, Gonioscopy slide: FS



OS

Entlebucher Sennendog, 5 y, m, OS slide: FS



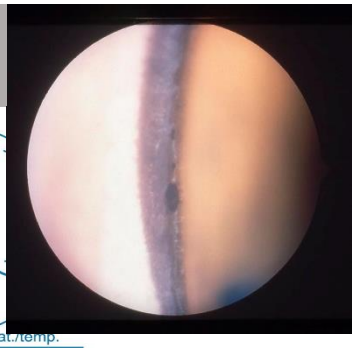
▲ 8. ICAA: Severe: PLA: laminae >50%, Width: narrow

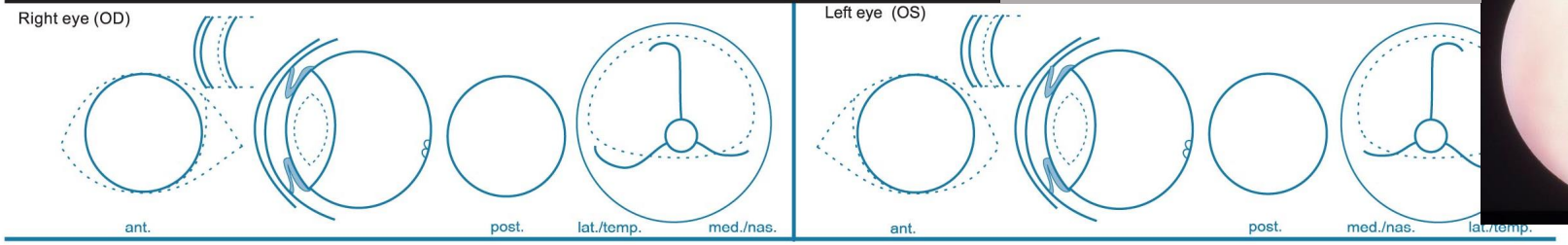
◆ 8. ICAA: Moderate: 25-50% LA, Width: narrow

● 8. ICAA: Severe- PLA: severe, Width: closed

■ 8. ICAA: unaffected-PLA<50%

Entlebucher Sennendog, 5 y, m, OS slide: FS





Descriptive comments: .....

.....

.....

Eye disease no. ..... ☐ severe

15. Other lens opacity: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☒ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	UNAFFECTED	suspicious / undetermined	AFFECTED
1. Persistent Pupillary Membrane (PPM)	☒	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☒	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☒	☐	☐
4. Retinal Dysplasia (RD)	☒	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☒	☐	☐
6. Collie Eye Anomaly (CEA)	☒	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	☒	☐	☐
8. IridoCorneal Angle Abnormality. (ICAA)	☐		☒ ☐ mild ☐ moderate ☒ severe

Results valid for 12 months

	UNAFFECTED	suspicious / undetermined	AFFECTED
11. Entropion / Trichiasis	☒	☐	☐
12. Ectropion / Macroblepharon	☒	☐	☐
13. Distichiasis / Ectopic cilia	☒	☐	☐
14. Corneal dystrophy	☒	☐	☐
15. Cataract (later onset)	☒	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other lens opacity
16. Lens luxation (primary)	☒	☐	☐
17. Retinal degeneration (PRA)	☒	☐	☐
18. Other:	☒	☐	☐

Interpretation

"UNAFFECTED" : signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "AFFECTED" : signifies that there is such evidence.
"Undetermined" : The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
“Suspicious" : The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis.

I.C.A.A.:

- **Pectinate ligament** abnormality (PLA): KP-HED; characterized by an abnormal pectinate ligament that can be divided into 2 predominant types: 1. **Fibrae latae**, 2. **Lamina**; Diagnosis is by gonioscopy.

- **Iridocorneal angle (ICA) width**: the width of the ICA is evaluated (using gonioscopy) by comparison of the length of the pectinate ligament PL (A) and the distance from the origin of the PL to the anterior surface of the cornea at the transection area: **open-narrow-closed**

Both: part of the Irido Corneal Angle abnormality (ICAA)

Irido Corneal Angle abnormality (ICAA): KP-HED;

8. ICAA: unaffected-mild-moderate- severe Specifying in Comments:

8. ICAA" and the specifying box

PLA:	**0-50% Fibrae Latae**	**= "un"affected**
	>50-100% FL and/or <25% LA	**= affected mild**
	25-50% Laminae (LA)	**= affected moderate**
	>50% LA	**= affected severe**
Width:		
	– Open	**= normal**
	– Narrow	**= affected moderate**
	– Closed	**= affected severe**