#### HED SESSION – Florence 2018



In cooperation with the Italien panel

# Case1: Weimaraner, 7 months, female, OU (abnormalities distinctly visible <u>after</u> pupil dilation)

OD

OS



# Case1: Weimaraner, 7 months, female, OU (abnormalities distinctly visible <u>after</u> pupil dilation)

Eye disease no. Imild severe Results for the known or presumed hereditary eye diseases (KP-HED): Results valid for 12 month UNAFFECTED UNDETERMINED AFFECTED INDETERMINED AFFE			$\sum$
Results for the known or presumed hereditary eye diseases (KP-HED):       Results valid for 12 month         UNAFFECTED UNDETERMINED AFFECTED         1. Persistent Pupillary Membrane (PPM)       Image: Colspan="2">Image: Colspan="2" Image: Colspan="2" Imag			severe
Results for the known or presumed hereditary eye diseases (KP-HED):       Results valid for 12 month         UNAFFECTED UNDETERMINED AFFECTED         1. Persistent Pupillary Membrane (PPM)       Image: Colspan="2">Image: Colspan="2" Image: Colspan="2" Imag		ICA (width)	- narrow (moderat
1. Persistent Pupillary Membrane (PPM)       Image: Constant of the second		(main)	closed (severe)
1. Persistent Pupillary Membrane (PPM)       Image: Constant of the second	ns		
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	NAFFECTED	SUSPICIOUS	AFFECTED
a second			
3. Cataract (congenital)			
(multi)focal			*
4. Retinal Dysplasia (RD)			cortica
5. Hypoplastic-/Micro-papilla   15. Cataract (non-congenital)  15. Cataract (non-congenital)			ant sut
6. Collie Eye Anomaly (CEA)			
7. Other: mild 17. Retinal degeneration (PRA)			
8 IridoComeal Angle Abnormality (ICAA)			
<ul> <li>"Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affe</li> </ul>	octod" sic	nifies that t	here is such evidence

\*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

- Distichiasis:presumed hereditary eye disease; 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.
- Persistent pupillary membrane (PPM):presumed hereditary <u>congenital eye disease</u> in which blood vessel remnants of the embryological vascular network in the **anterior chamber** of the eye fail to regress which normally occurs during the first 4 to 5 weeks of life.These remnants may be found on the surface of the iris at the **collarette**, the lens capsule or against the corneal endothelium or strands may bridge from **iris** to iris, iris to **cornea**, iris to **lens**, with or without sheets of tissue in the **anterior chamber**. The last three forms pose the greatest threat to vision and, when severe, vision impairment may occur.

#### HED Manual 2017-04: Ch. 6 Guidelines

• **Distichiasis**: 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, the examiner will also tick the box: "severe' in the comment area.

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• **Persistent Pupillary Membrane**: Remnants, still distinctly present after pupil dilatation, crossing the pupil, corneal, or with lens involvement, are ticked in the box for 1. PPM: "affected" and the respective box of other parts involved. Areas which can be involved are: retrocorneal (boxes PPM and cornea); strands from cornea to iris (boxes: PPM, cornea and iris); from iris to iris (boxes PPM and iris); iris to lens (boxes: PPM, iris and lens), connected to areas of cataract (also the box for congenital cataract is ticked); strands connected to a sheet/"spider web" of tissue in the anterior chamber (boxes PPM, lamina and other parts involved are ticked). Remnants of the pupillary membrane, which are not distinctly visible on the iris surface/collarette (using 10 x magnification) <u>after</u> pupil dilatation, are not mentioned on the form. Tiny, more or less triangular shaped dots, centrally, on the anterior capsule of the lens: these are drawn in the figures in the "drawing area" and are not ticked in the 'undetermined' or 'affected' boxes in the Results area.

#### Case 3: Malinois, 4 years, male OU



#### Case 3: Malinois, 4 years, male OU

Descriptive comments:	Descriptive comments: "working dog retinopathy"									mild		
					e ha stv m m i 31				>	severe		
13	0									- narrov	v (moderate)	
Eye disease no.		🔲 mild		se	evere				(width)	Closed	(severe)	
Results for the kno	wn or presumed l	hereditary of	eye diseas	es (KP-H	IED):		Results valid for 12 mo	onths	120123			
	U	NAFFECTED U	NDETERMINED	AFFECTED				UNAFFECT	ED SUSPICIOUS	AFFECTED		
1. Persistent Pupillary M	(PPM)			$\square$	iris lens	cornea	11. Entropion/Trichiasis					
2. Persistent Hyperpl.Tu Lentis/Primary Vitreo	unica Vasculosa us (PHTVL/PHPV)			$\square$	grade 1		12. Ectropion/Macroblephare	on 🗖				
3. Cataract (congenital)					(multi)focal		13. Distichiasis /Ectopic cilia					
4. Retinal Dysplasia (RD	))			$\prec$	geographica	ıl	14. Corneal dystrophy				cortical	
5. Hypoplastic-/Micro-pa	apilla				choroid. hyp	oplasia	15. Cataract (non-congenita	) c 🗆			ant sut. I.	
6. Collie Eye Anomaly (	CEA)			$\triangleleft$	coloboma	3	16. Lens luxation (primary)			$\Box$	punctata nucleus other	
7. Other:					i mild		17. Retinal degeneration (PR	RA) 🗆			other	
8 IridoComeal Angle Al	phormality. (IGAA)				severe		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.

\*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

\*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

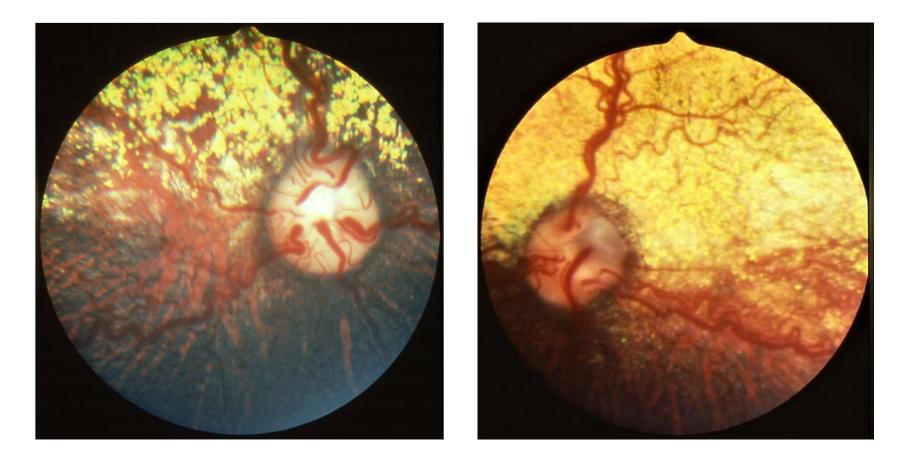
# HED Manual 2017-04: Ch. 6 Guidelines Comments

- Why do not tick "Other" and put in comments "presumed hereditary retinal degenerations"?
- "18. Other", on the certificate for KP-HED, which are considered not to be congenital/developmental or which are progressive, and not yet named on the form, are mentioned. The available name of the disease in the list of 'Definitions' of this Manual (see chapter 5) is used.
- "Working dog retinopathy" is not available in definitions as a presumed hereditary retinal degeneration
- $\rightarrow$  Write in the descriptive comments area: Working dog retinopathy





# Case 4: Rough Collie, 4 years, male op os



#### Case 4: Rough Collie, 4 years, male

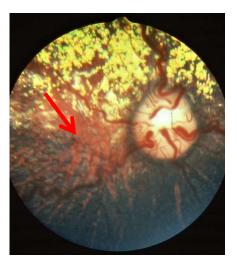
Descriptive comments:					8. IC		mild miderate
Eye disease no.			🖂 severe			ICA (width)	severe     narrow (moderate)     closed (severe)
Results for the known or presumed	hereditar	y eye diseas	es (KP-HED):	Results valid for 12 mon	ths	***	
	UNAFFECTED	UNDETERMINED	AFFECTED		UNAFFECTED	SUSPICIOUS	AFFECTED
1. Persistent Pupillary Membrane (PPM)			lens lamina	11. Entropion/Trichiasis			
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)			grade 1 grade 2-6	12. Ectropion/Macroblepharon			
3. Cataract (congenital)			(multi)focal	13. Distichiasis /Ectopic cilia			
4. Retinal Dysplasia (RD)			geographical total	14. Corneal dystrophy			cortical
5. Hypoplastic-/Micro-papilla			Choroid. hypoplasia	15. Cataract (non-congenital)			ant sut. I.
6. Collie Eye Anomaly (CEA)			Coloboma	16. Lens luxation (primary)			punctata nucleus other
7. Other:				17. Retinal degeneration (PRA	) 🗖		
8 IridoCorneal Angle Abnormality (CAA)			severe	18. Other:			

#### Interpretation

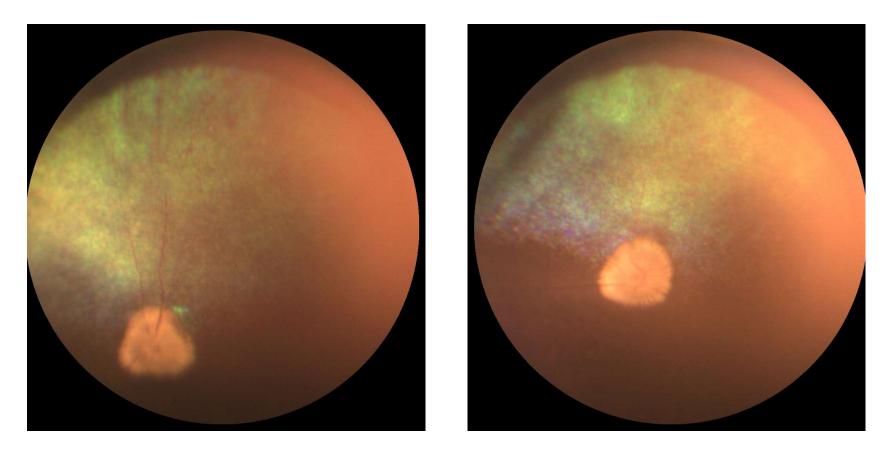
- \* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.
- \*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
- \*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

• Collie Eye Anomaly (CEA): known hereditary congenital eye disease; a **congenital** syndrome of ocular anomalies mainly in Collie breeds 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, CRD) with or without coloboma, retinal detachment and intraocular hemorrhage. Vision varies with the degree to which an individual is affected and may be minimally compromised to having severe visual impairment or blindness. DNAtests for choroidal hypoplasia in specific breeds are available.





### Case 6 Miniature Schnauzer, male, 4 years, OU op os



#### Case 6 Miniature Schnauzer, male, 4 years, OU

Descriptive comments:						8. IC	XAA: PLA	mild moderate
Eye disease no.	. 🗆 mil	d		severe			ICA (width)	V severe 
Results for the known or presumed	*	**	*		Results valid for 12 mor	*	***	*
1	JNAFFECTED	UNDETERMINED	AFFECTED	C		UNAFFECTED	SUSPICIOUS	AFFECTED
1. Persistent Pupillary Membrane (PPM)			$\square$	lens lamina	11. Entropion/Trichiasis			
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)			$\Box$	grade 1	12. Ectropion/Macroblepharon			
3. Cataract (congenital)				(multi)focal	13. Distichiasis /Ectopic cilia			
4. Retinal Dysplasia (RD)			$\triangleleft$	geographical	14. Corneal dystrophy			cortical
5. Hypoplastic-/Micro-papilla				choroid. hypoplasia	15. Cataract (non-congenital)			post. pol. ant sut. I.
6. Collie Eye Anomaly (CEA)				coloboma	16. Lens luxation (primary)			punctata nucleus other
7. Other:				/ mild	17. Retinal degeneration (PR/	A) 🗀		
IrideCorneal Angle Abnormality: ((e)(-)     Interpretation				severe	18. Other:			

\* "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.

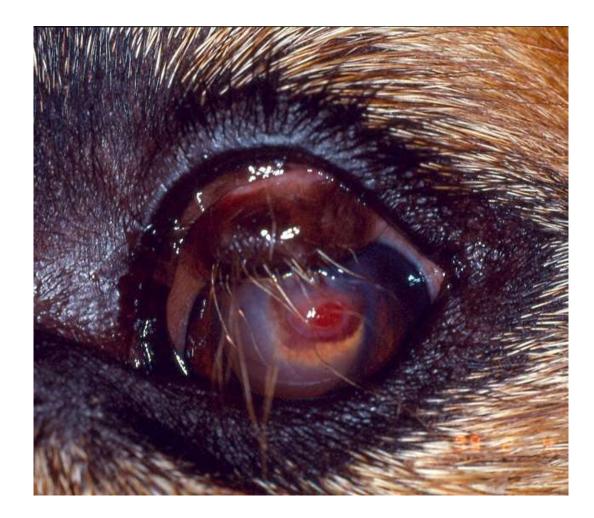
\*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

\*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

 Retinal degeneration/Progressive Retinal Atrophy (PRA): known hereditary eye disease; a group of bilateral, hereditary dysplastic and /or degenerative diseases of the photoreceptors primarily, progressing to blindness in both eyes simultaneously. The onset of the blindness depends on the affected breed and the type of process (dysplasia and/or degeneration). The photoreceptor abnormalities can be detected by an electroretinogram (not part of a routine ECVO Scheme eye examination) before there are detectable fundus changes observed by ophthalmoscopy.

 These funduscopic changes consist in the early disease of a change in reflectivity with greyish discoloration mainly in the periphery and midperiphery in the tapetal area of the fundus accompanied by slight vascular attenuation.With progression of the disease there are more generalized changes with hyperreflectivity of the tapetal fundus, depigmentation and uneven pigment distribution in the non-tapetal fundus, severe vascular attenuation and a pale optic disc. There are multiple genetic types of PRA including different forms of rod-cone dysplasia and degeneration (rcd1-4) and progressive rod cone degeneration (prcd). DNA-tests for specific forms and breeds are available.

#### Case 7: German Shepherd, 6 months, female, OS



#### Case 7: German Shepherd, 6 months, female, OS

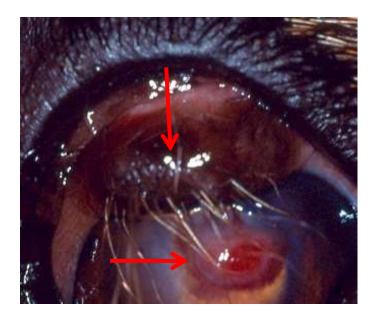
Descriptive comments:							- mild	ite
Eye disease no.	1999 (1999 (1999 (1999 (1999 (1999 (1999 (1999 (1999 (1999 (1999 (1999 (1999 (1999 (1999 (1999 (1999 (1999 (199	ild	severe			ICA (width)	- severe - narrow - closed (	(moderate) (severe)
Results for the known or presum	ed heredita	ry eye disea	ses (KP-HED):	Results valid for 12 mon	ths	52572		
	UNAFFECTED	UNDETERMINE	D AFFECTED		UNAFFECTED	SUSPICIOUS	AFFECTED	
1. Persistent Pupillary Membrane (PP	/)		iris Cornea	11. Entropion/Trichiasis				
2. Persistent Hyperpl.Tunica Vasculo Lentis/Primary Vitreous (PHTVL/PHPV	sa 🗖		grade 1 grade 2-6	12. Ectropion/Macroblepharon				
3. Cataract (congenital)			(multi)focal	13. Distichiasis /Ectopic cilia				
4. Retinal Dysplasia (RD)			geographical	14. Corneal dystrophy				cortical
5. Hypoplastic-/Micro-papilla			choroid. hypoplasia	15. Cataract (non-congenital)				ant sut. I.
6. Collie Eye Anomaly (CEA)				16. Lens luxation (primary)				nucleus
7. Other: Dermoid			other:	17. Retinal degeneration (PRA	A) 🗖			other
8. IridoComeal Angle Abnormality. (re			severe	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.
- \*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
- \*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

• **Dermoid:** presumed hereditary eye disease;

a congenital patch of skin in an abnormal location. Most ocular dermoids affect the **cornea** or adjacent **conjunctiva**, and its presence usually causes ocular irritation

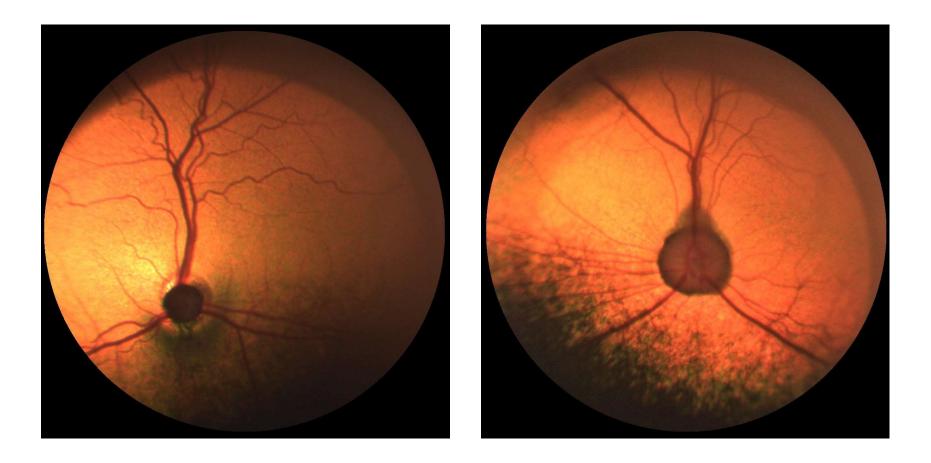


#### HED Manual 2017-04: Ch. 6 Guidelines

• "7. Other", on the certificate, known and presumed hereditary eye <u>anomalies (congenital/developmental, non-progressive)</u> are mentioned. The terminology for the diseases as given in chapter 5. Definitions of this manual are to be used. These disease names are also used in "roll down" menus in the computerized forms.

#### Case 8: Bernese Mountain Dog, 9 months, male

OD (blind)



#### Case 8: Bernese Mountain Dog, 9 months, male

Descriptive comments:				8. ICAA: PLA	mild mild
22 <u></u>					severe
Eye disease no.		severe		(width)	narrow (moderate)     closed (severe)
Results for the known or presume	ed hereditary eye dis	eases (KP-HED):	Results valid for 12 months	* ***	
	UNAFFECTED UNDETERN	INED AFFECTED	UNAF	FECTED SUSPICIOUS	AFFECTED
1. Persistent Pupillary Membrane (PPM	) 🗗 🖂	lens lamina	11. Entropion/Trichiasis		
2. Persistent Hyperpl.Tunica Vasculos Lentis/Primary Vitreous (PHTVL/PHPV)	a 🗆 🗆	grade 1 grade 2-6	12. Ectropion/Macroblepharon		
3. Cataract (congenital)		(multi)focal	13. Distichiasis /Ectopic cilia		
4. Retinal Dysplasia (RD)		geographical	14. Corneal dystrophy		cortical post. pol.
5. Hypoplastic-/Micro-papilla		choroid. hypoplasia	15. Cataract (non-congenital)		ant sut. I.
6. Collie Eye Anomaly (CEA)		coloboma	16. Lens luxation (primary)		punctata nucleus other
7. Other:	$\square$	mild	17. Retinal degeneration (PRA)		
- 8 IrideComeal Angle Abnormality. (c)	•	severe	18. Other:		

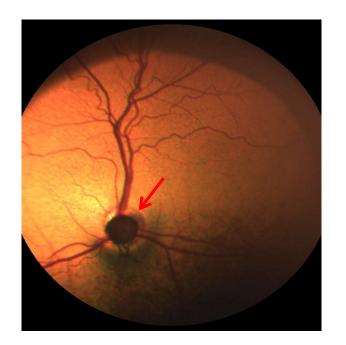
#### Interpretation

\* "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.

\*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

\*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

 Hypoplasia-/ optic disc hypoplasia: presumed hereditary eye disease; congenital failure of development of the optic nerve which causes blindness and abnormal pupil response in the affected eye. Can often not be differentiated from micropapilla on a routine (dilated) ECVO eye examination



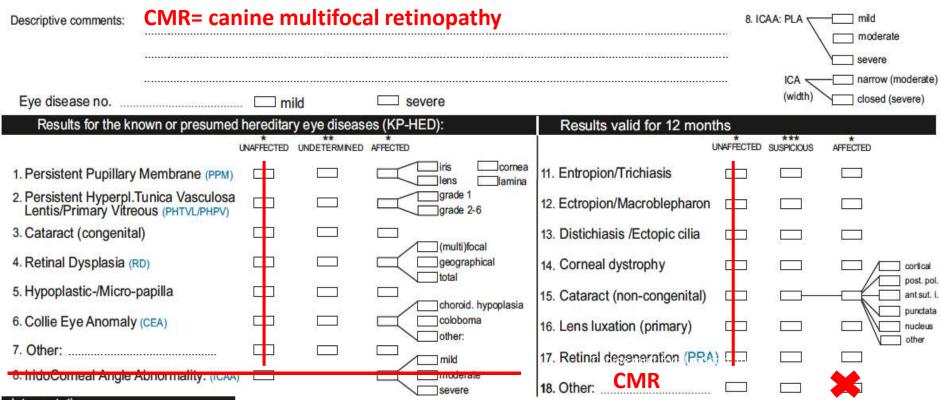
#### HED Manual 2017-04: Ch. 6 Guidelines

• OD: Optic nerve hypoplasia: see and use hypoplastic papilla/optic disc

### Case 9: Cane Corso, female, 8 months, OU



#### Case 9: Cane Corso, female, 8 months, OU



#### Interpretation

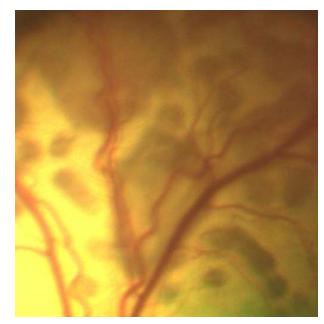
\* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.

\*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

\*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

### • Canine multifocal retinopathy (CMR):

<u>known hereditary eye disease</u>; 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



#### HED Manual 2017-04: Ch. 6 Guidelines

"18. Other", on the certificate for KP-HED, which are considered not to be congenital/developmental or which are progressive, and not yet named on the form, are mentioned. The available name of the disease in the list of 'Definitions' of this Manual (see chapter 5) is used.

## Case 10: Siberian Husky, 3 years, female, OU op os



### Siberian Husky, 3 years, female

Descriptive comments:						8. 10		mild	erate
Eye disease no. 14			severe				ICA (width)	5	e w (moderate) d (severe)
Results for the known or presume			ses (KP-HED):		Results valid for 12 mont	hs	200 - 100 - 100 - 100		
	UNAFFECTED U	** NDETERMINED	AFFECTED	,	ί	INAFFECTED	*** SUSPICIOUS	AFFECTED	
1. Persistent Pupillary Membrane (PPM)				cornea	11. Entropion/Trichiasis				
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)			grade 1		12. Ectropion/Macroblepharon				
3. Cataract (congenital)				22.0	13. Distichiasis /Ectopic cilia				
4. Retinal Dysplasia (RD)			(multi)fr geogra total		14. Corneal dystrophy				cortical post. pol.
5. Hypoplastic-/Micro-papilla				. hypoplasia	15. Cataract (non-congenital)				ant sut. I.
6. Collie Eye Anomaly (CEA)			colobor other:		16. Lens luxation (primary)			$\square$	punctata nucleus other
7. Other:			mild		17. Retinal degeneration (PRA	) 🗖			
- 8- IridoCorneal Angle Abnormality. (ICAN	<u>,                                     </u>			ito	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.

\*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

\*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

- **Corneal dystrophy:** <u>presumed hereditary eye disease</u>; noninflammatory **corneal** opacity in one or more of the **corneal** layers (epithelium, stroma, endothelium). It is usually bilateral but not always symmetrical. The onset in one eye may precede the other
- **Cataract:** any hereditary or non-hereditary, congenital or acquired, non-physiological opacity of the **lens** and/or its capsule. The defect may result in blindness if complete and bilateral. All bilateral or unilateral cataracts and especially cortical cataracts are <u>known and presumed hereditary eye</u> <u>diseases</u> except in cases known to be associated with trauma, other causes of ocular inflammation, metabolic disease, nutritional deficiencies, persistent pupillary membrane, persistent hyaloid artery or old age. DNA-tests for specific breeds are available.

### HED Manual 2017-04: Ch. 6 Guidelines

• **Corneal dystrophy** is to be ticked affected at no. 14 Corneal dystrophy, and the details described in the field Descriptive comments.

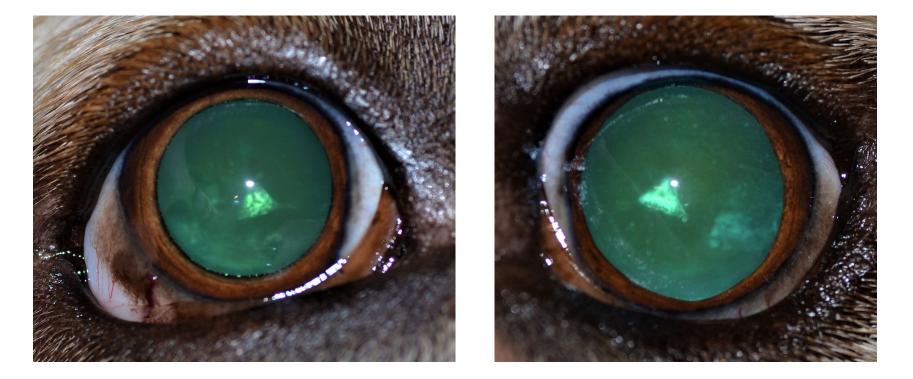
Only if endothelial dystrophy or macular dystrophy or severe forms of stromal dystrophy (e.g. in Siberian Husky), is recognized, the examiner will also tick the box: "severe' in the comment area.

• **Cataracts:** if observed in the period between birth and the 8<sup>th</sup> week of age the entity is ticked as congenital. Cataracts diagnosed at older age are ticked as non-congenital (acquired). If there is distinct proof the cataract is congenital in origin (e.g. associated PPM), the boxes for congenital and non-congenital cataracts can be ticked. It is strongly recommended to draw the cataract in the "pre-drawings" on the certificate, as seen from the anterior lens capsule (see separate instructions for drawing and filling the form). For the Scheme it is advised all bilateral or unilateral cataracts and especially cortical cataracts are presumed hereditary.

# Case 11: Labrador Retriever, 14 months, female, OU

OD





# Case 11: Labrador Retriever, 14 months, female, OU

Descriptive comments:								mild moderate
Eye disease no.	. 🗆 mi	ild	□ se	evere			ICA (width)	
Results for the known or presumed	*	**	*	ED):	Results valid for 12 mont	*	***	*
1. Persistent Pupillary Membrane (PPM)			AFRECIED	iriscornea	11. Entropion/Trichiasis		SUSPICIOUS	AFFECTED
<ol> <li>Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)</li> </ol>			$\mathbb{R}$	lens lamina grade 1 grade 2-6	12. Ectropion/Macroblepharon			
3. Cataract (congenital)					13. Distichiasis /Ectopic cilia			
4. Retinal Dysplasia (RD)			$\leq$	(multi)focal geographical total	14. Corneal dystrophy			cortica
5. Hypoplastic-/Micro-papilla				choroid. hypoplasia	15. Cataract (non-congenital)			post. p
6. Collie Eye Anomaly (CEA)			$\leq$	coloboma	16. Lens luxation (primary)			
7. Other:	Ь			other:	17. Retinal degeneration (PRA)			\ other
8. IndeCorneal Angle Abnormality. (10/44)			-	severe	18. Other:			

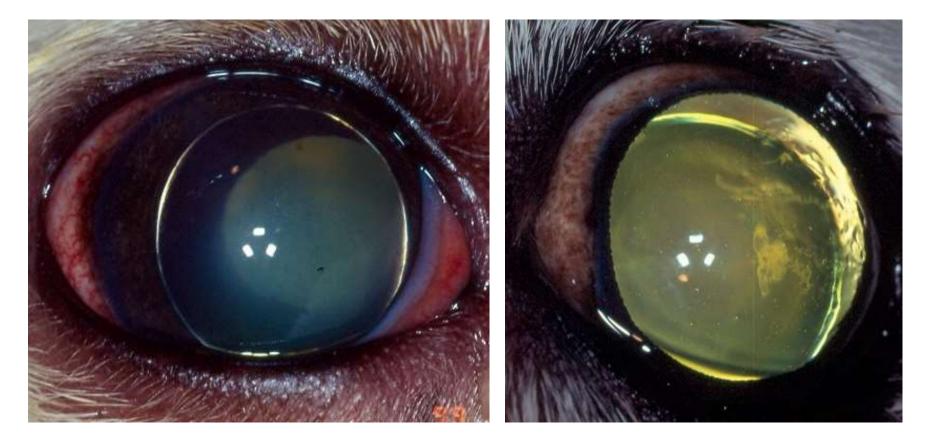
#### Interpretation

- \* "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.
- \*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
- \*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in ......months.

#### Case 12: Volpino Italiano, 4 years, male, OU

OD

OS



#### Case 12: Volpino Italiano, 4 years, male, OU

Descriptive comments:						8.1		— mild
								moderate
								severe
								- narrow (moderate
Eye disease no.	🗆 <mark>mi</mark>	d	S S	evere			(width)	closed (severe)
Results for the known or presumed	hereditary	y eye diseas	es (KP-ł	HED):	Results valid for 12 mor	ths		
	UNAFFECTED	UNDETERMINED	AFFECTED			UNAFFECTED	SUSPICIOUS	AFFECTED
1. Persistent Pupillary Membrane (PPM)			$\square$	iris Cornea	11. Entropion/Trichiasis			
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)			$\triangleleft$	grade 1 grade 2-6	12. Ectropion/Macroblepharon			
3. Cataract (congenital)					13. Distichiasis /Ectopic cilia			
4. Retinal Dysplasia (RD)			$\leq$	(multi)focal geographical total	14. Corneal dystrophy			cortical
5. Hypoplastic-/Micro-papilla				Charaid humanlasia	15. Cataract (non-congenital)			ant sut.
6. Collie Eye Anomaly (CEA)			$\prec$	coloboma     other:	16. Lens luxation (primary)			punctata nucleus other
7. Other:				mild	17. Retinal degeneration (PR)	A) 🗖		
8. IridoCorneal Angle Abnormality. (1044	)		$\leq$	mederale	10 OH		_	_
Interpretation				severe	18. Other:			

#### Interpretation

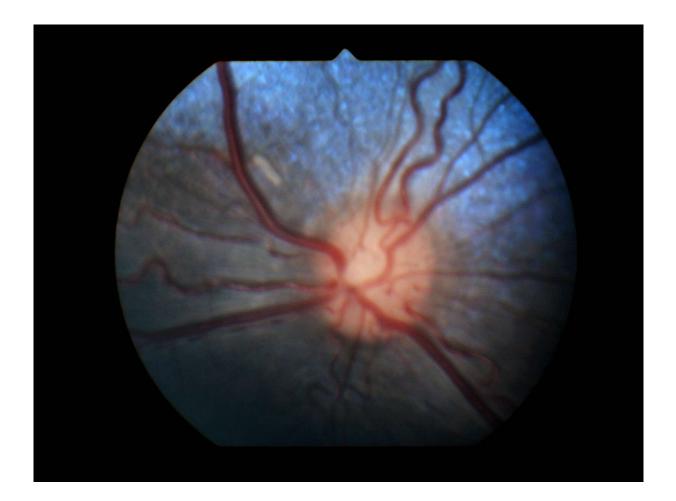
\* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.

\*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

\*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

Lens luxation (primary): <u>known hereditary eye disease</u>; partial (subluxation) or complete displacement of the lens from the normal anatomic site, in the fossa patellaris, behind the **pupil**. Lens luxation may result in elevated intraocular pressure (glaucoma) causing vision impairment or blindness. DNA-tests for specific breeds are available.

## Case 14: Rough Collie, female 7 weeks, OS



### Case 14: Rough Collie, female 7 weeks, OS

Descriptive comments:	fold							──── mild ∖	
Eye disease no.	······	. 🗔 mild		□ s	evere			ICA (width)	severe     narrow (moderate)     closed (severe)
Results for the kn	own or presumed	hereditary	eye diseas	es (KP-ł	HED):	Results valid for 12 mont	hs	1000075	
	ı	UNAFFECTED U	** NDETERMINED	AFFECTED		U	NAFFECTED	*** SUSPICIOUS	* AFFECTED
1. Persistent Pupillary	Membrane (PPM)			$\square$	iris Cornea	11. Entropion/Trichiasis			
2. Persistent Hyperpl. Lentis/Primary Vitre	Tunica Vasculosa ous (PHTVL/PHPV)			$\square$	grade 1 grade 2-6	12. Ectropion/Macroblepharon			
3. Cataract (congenita	l)				(multi)focal	13. Distichiasis /Ectopic cilia			
4. Retinal Dysplasia (F	ED)			$\prec$	geographical	14. Corneal dystrophy			cortical post. pol.
5. Hypoplastic-/Micro-	papilla				choroid. hypoplasia	15. Cataract (non-congenital)			ant sut. I.
6. Collie Eye Anomaly	(CEA)			$\prec$	coloboma	16. Lens luxation (primary)	Č 🗆		punctata nucleus other
7. Other:					mild	17. Retinal degeneration (PRA)			
8 IridoComoal Anglo	hpormality. (CAA)			$\prec$	moderate severe	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.

\*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

\*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

• Retinal folds: hereditary or nonhereditary changes in the retina, can be neuroretinal folding due to hereditary factors or as sequelae post inflammation

• In puppies, linear or round juvenile folds, usually in the peripapillary area, may be observed as a result in inequity in the relative growth rates of the optic cup and these folds resolve as the animal matures. These folds are not accurately referred to as dysplasia and should be ticked "unaffected", but can be described in the comments area. In the English Springer Spaniel, Golden Retriever, Labrador Retriever and Samoyed these juvenile folds are considered as retinal dysplasia (RD) and should be ticked "undetermined" or "affected".

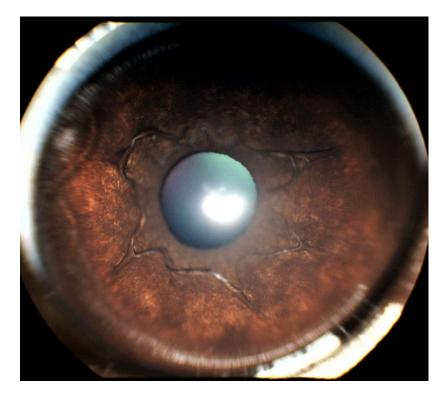


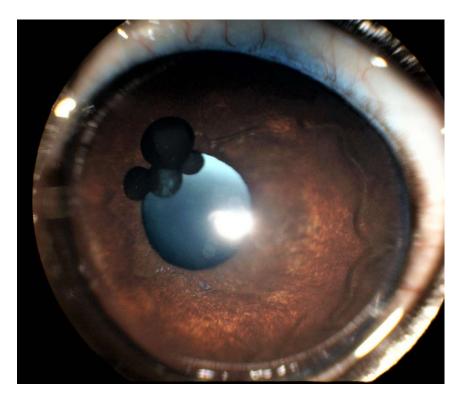
## Case 15: Bouvier des Flandres, 2 months, male, OU

(abnormalities distinctly visible using 10 x magnification <u>after</u> pupil dilation)

OD







## Case 15: Bouvier des Flandres, 2 months, male, OU

(abnormalities distinctly visible using 10 x magnification after pupil dilation)

Descriptive comments:								- mild moderate
Eye disease no.			37 725-	severe			ICA (width)	severe     narrow (moderate)     closed (severe)
Results for the known or presumed	hereditar	y eye diseas	es (KP-	HED):	Results valid for 12 mor	nths	***	
	UNAFFECTED	UNDETERMINED	AFFECTED			UNAFFECTED		AFFECTED
1. Persistent Pupillary Membrane (PPM)			×	iris Cornea	11. Entropion/Trichiasis			
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)			$\square$	grade 1 grade 2-6	12. Ectropion/Macroblepharor	ם י		
3. Cataract (congenital)				(multi)focal	13. Distichiasis /Ectopic cilia			
4. Retinal Dysplasia (RD)			$\prec$	geographical	14. Corneal dystrophy			cortical
5. Hypoplastic-/Micro-papilla				choroid. hypoplasia	15. Cataract (non-congenital)			ant sut. I.
6. Collie Eye Anomaly (CEA)			$\prec$	coloboma	16. Lens luxation (primary)			punctata nucleus other
7. Other:				/ mild	17. Retinal degeneration (PR	A) 🗖		
- S. IridoComeal Angle Abnormality: (ICAA) Interpretation			$\leq$	severe	18. Other: Uveal cyst	S 🗖		

\* "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.

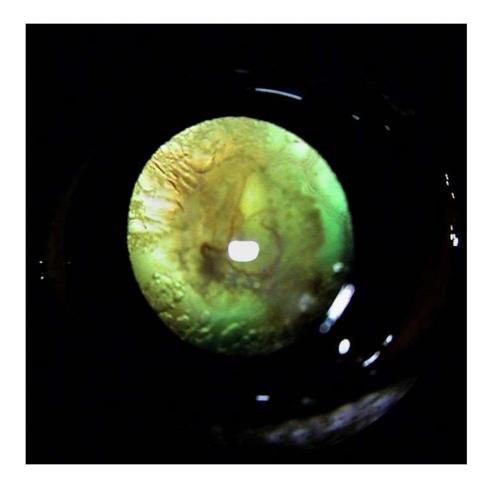
\*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

\*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in ......months.

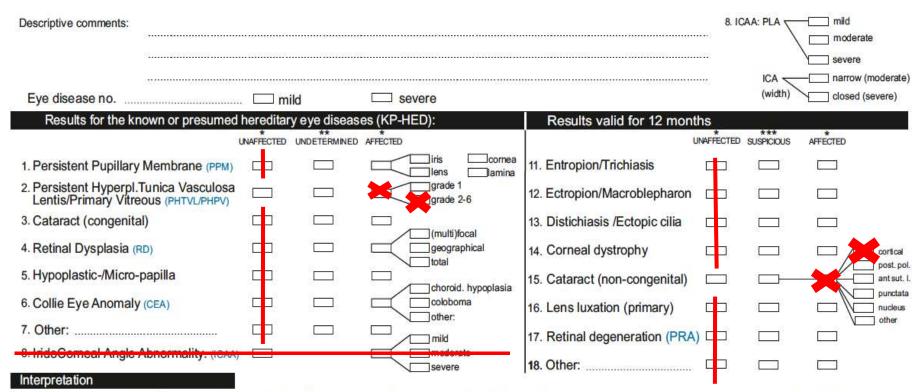
- Persistent pupillary membrane (PPM):presumed hereditary congenital eye disease in which blood vessel remnants of the embryological vascular network in the anterior chamber of the eye fail to regress which normally occurs during the first 4 to 5 weeks of life.These remnants may be found on the surface of the iris at the collarette, the lens capsule or against the corneal endothelium or strands may bridge from iris to iris, iris to cornea, iris to lens, with or without sheets of tissue in the anterior chamber. The last three forms pose the greatest threat to vision and, when severe, vision impairment may occur.
- Uveal cyst: presumed hereditary eye disease; 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 pigmented spheres in the **anterior chamber**. When reaching maximal size, cysts tend to adhere to the **endothelial** surface in the center of the **cornea**, thus causing visual impairment

- Remnants of the pupillary membrane, still distinctly present after pupil dilatation, crossing the pupil, corneal, or with lens involvement, are ticked in the box for 1. PPM: "affected" and the respective box of other parts involved. Areas which can be involved are: retrocorneal (boxes PPM and cornea); strands from cornea to iris (boxes: PPM, cornea and iris); from iris to iris (boxes PPM and iris); iris to lens (boxes: PPM, iris and lens), connected to areas of cataract (also the box for congenital cataract is ticked); strands connected to a sheet/"spider web" of tissue in the anterior chamber (boxes PPM, lamina and other parts involved are ticked).
- Uveal cysts: "18. Other", on the certificate for KP-HED, which are considered not to be congenital/developmental or which are progressive, and not yet named on the form, are mentioned. The available name of the disease in the list of 'Definitions' of this Manual (see chapter 5) is used.

# Case 16 Dobermann, 2.5 years, male, OD



#### Case 16 Dobermann, 2.5 years, male, OD



\* "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.

\*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

\*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

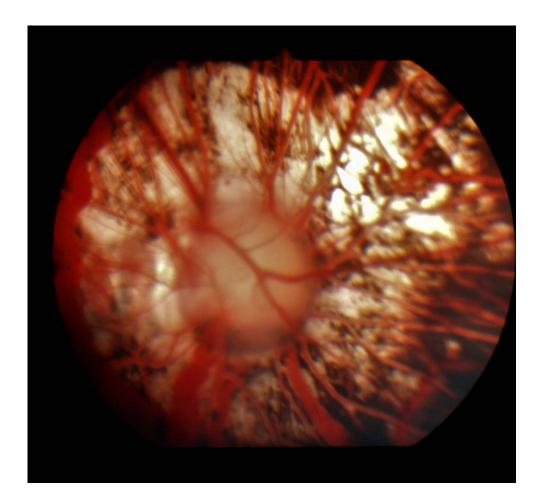
- Persistent hyperplastic tunica vasculosa lentis/ persistent hyperplastic primary vitreous (PHTVL/ PHPV):known or presumed hereditary, congenital eye disease which results from failure of regression of the embryologic vascular network, surrounding the developing lens and primary vitreous. The latter 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 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
- Cataract: any hereditary or non-hereditary, congenital or acquired, non-physiological opacity of the lens and/or its capsule. The defect may result in blindness if complete and bilateral. All bilateral or unilateral cataracts and especially cortical cataracts are known and presumed hereditary eye diseases except in cases known to be associated with trauma, other causes of ocular inflammation, metabolic disease, nutritional deficiencies, persistent pupillary membrane, persistent hyaloid artery or old age. DNA-tests for specific breeds are available.

• *PHTVL/PHPV:* Minor, yellow-brown dots of fibrous tissue remaining retrolentally, more or less centrally on the posterior capsule of the lens (See fig. 21) are ticked as PHTVL/PHPV affected, and the specifying box as grade 1. These grade 1 dots are not to be confused with scattered pigment, retrolental near or on the posterior capsule of the lens. If they are unilateral, and of minimal degree, 'undetermined' is ticked.

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: lenticonus, or even more severe malformations of the lens such as pigment or blood in the lens or behind it, lens hypoplasia, spherophakia, elongated ciliary processus etc.; and/or microphthalmia may be present. In the grade 2-6 forms, cataract develops, usually beginning centrally. ) are ticked as PHTVL/PHPV affected,

Unilateral or bilateral grade 2-6 forms are ticked as PHTVL/PHPV 'affected' and the specifying box as grade 2-6.

## Case 17: Dachshund, 3 years, male, OS



## Case 17: Dachshund, 3 years, male, OS

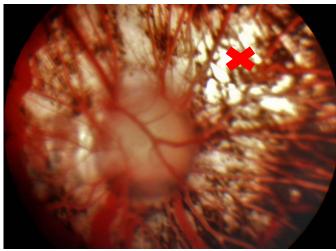
Descriptive comments:							8. 1	CAA: PLA	mild	
Eye disease no.		. 🗀 mil	ld	🖂 sev	rere			ICA (width)	. <u></u>	e w (moderate) d (severe)
Results for the know		*	**	*	:D):	Results valid for 12 mo	*	***	*	
	ા	INAFFECTED	UNDETERMINED	AFFECTED			UNAFFECTED	SUSPICIOUS	AFFECTED	
1. Persistent Pupillary M	(PPM)				iris cornea	11. Entropion/Trichiasis				
2. Persistent Hyperpl.Tu Lentis/Primary Vitreo	unica Vasculosa us (PHTVL/PHPV)				grade 1 grade 2-6	12. Ectropion/Macroblepharo	n 🗖			
3. Cataract (congenital)					(multi)focal	13. Distichiasis /Ectopic cilia				
4. Retinal Dysplasia (RD	)				geographical	14. Corneal dystrophy				cortical
5. Hypoplastic-/Micro-pa	apilla				choroid. hypoplasia	15. Cataract (non-congenital)	) 🗖			post. pol.
6. Collie Eye Anomaly (	CEA)				coloboma other:	16. Lens luxation (primary)			$\square$	punctata nucleus
7. Other:					mild	17. Retinal degeneration (PR	RA) □□			other
- 8. IrideCorneal Angle At	onormality. (IOAA)				mederate severe	Uveodermatol 18. Other: syndrome	- <b>-</b>			

#### \* "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.

\*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

\*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

 Uveodermatologic syndrome: an immune-mediated syndrome of severe uveitis combined with dermal depigmentation (vitiligo) and hair depigmentation (poliosis). Secondary glaucoma and/or retinal detachment are frequent complications of this disease. Seen most commonly in the Akita Inu, Samoyed, Siberian Husky breeds. A similar syndrome is recognized in people and is called Vogt-Koyanagi-Harada syndrome (VKH)

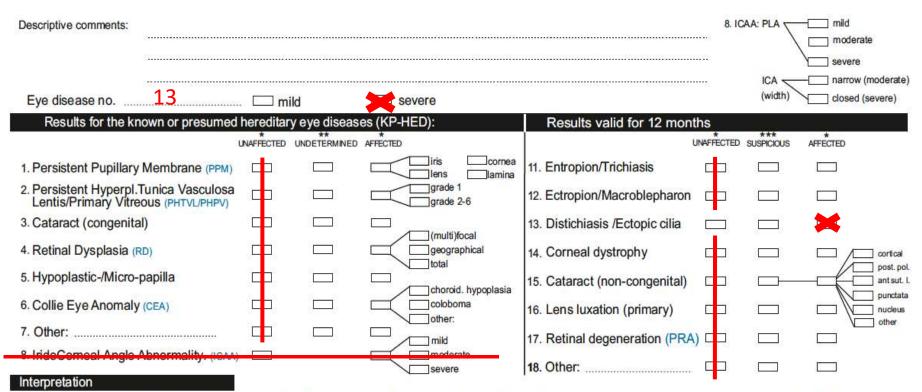


• For number "**18. Other**", on the certificate for KP-HED, which are considered not to be congenital/developmental or which are progressive, and not yet named on the form, are mentioned. The available name of the disease in the list of 'Definitions' of this Manual (see chapter 5) is used.

## Case 18: English Bulldog, 9 months, female



#### Case 18: English Bulldog, 9 months, female



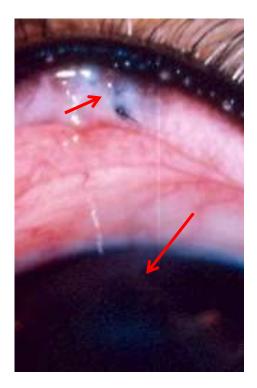
\* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.

\*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

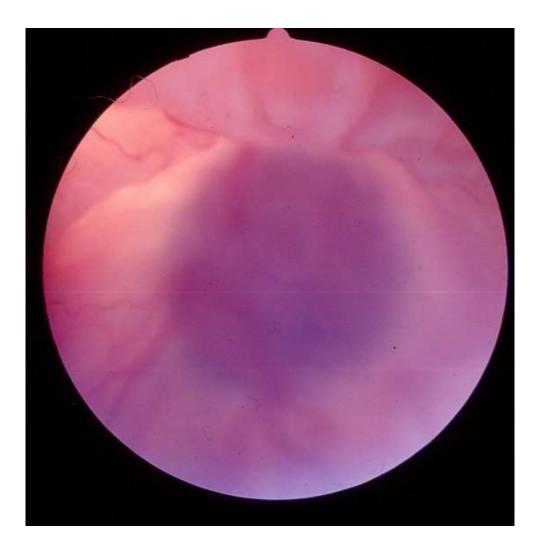
\*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in ......months.

• 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.

 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, the examiner will also tick the box: "severe" in the comment area.



## Case 19: Rough Collie, 3 months, male, OD



## Case 19: Rough Collie, 3 months, male, OD

Descriptive comments: Retinal detachment							8. 10		A mild moderate		
					evere				ICA (width)	、 <u> </u>	e w (moderate) d (severe)
Results for the know	vn or presumed i	hereditary	y eye diseas	es (KP-H	IED):	ļ	Results valid for 12 mon	ths	***	*	
	ι	NAFFECTED	UNDETERMINED	AFFECTED				UNAFFECTED		AFFECTED	
1. Persistent Pupillary M	embrane (PPM)			$\square$		ornea 11 amina	. Entropion/Trichiasis				
2. Persistent Hyperpl.Tur Lentis/Primary Vitreou	nica Vasculosa s (PHTVL/PHPV)			$\square$	grade 1 grade 2-6	12	2. Ectropion/Macroblepharon				
3. Cataract (congenital)					/multiVecal	13	3. Distichiasis /Ectopic cilia				
4. Retinal Dysplasia (RD)				$\prec$	(multi)focal geographical total	14	. Corneal dystrophy				cortical
5. Hypoplastic-/Micro-pa	pilla				choroid. hypopla	lasia 15	5. Cataract (non-congenital)				ant sut. I.
6. Collie Eye Anomaly (C	EA)			$\mathbf{X}$	coloboma other:	100	5. Lens luxation (primary)			$\Box$	punctata nucleus other
7. Other:					1 mild	17	7. Retinal degeneration (PRA	() 🗆			
IndeCorneal Angle Ab	normality: (ICAA)				mederate severe	18	3. Other:				

Interpretation

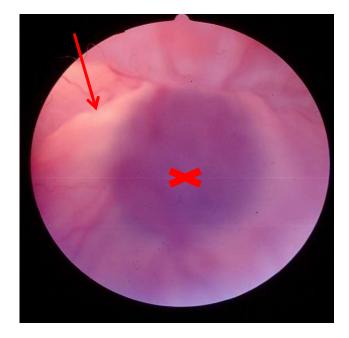
\* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.

\*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

\*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

• Collie Eye Anomaly (CEA): known hereditary congenital eye disease; a congenital syndrome of ocular anomalies mainly in Collie breeds 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, CRD) with or without coloboma, retinal detachment and intraocular hemorrhage. Vision varies with the degree to which an individual is affected and may be minimally compromised to having severe visual impairment or blindness. DNA-tests for choroidal hypoplasia in specific breeds are available.

• 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 such cases the breeder/owner is advised to distinguish the status of the animal by e.g. DNA testing. The box "Affected – other" has to be specified in the comment area of the ECVO certificate (retinal detachment or –haemorrhage).



#### Case 20: Australian Shepherd, 15 months, male, OD



#### Case 20: Australian Shepherd, 15 months, male, OD

Descriptive comments:					8. IC		- mild moderate
					0	ICA (width)	severe narrow (moderate)
Eye disease no.			severe			(widen)	closed (severe)
Results for the known or presumed	hereditary e	ye diseas	es (KP-HED):	Results valid for 12 months	s	111	
	UNAFFECTED UN	DETERMINED	AFFECTED	UNA	FFECTED	SUSPICIOUS	AFFECTED
1. Persistent Pupillary Membrane (PPM)			iris Cornea	11. Entropion/Trichiasis			
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)			grade 1 grade 2-6	12. Ectropion/Macroblepharon			
3. Cataract (congenital)			(multi)focal	13. Distichiasis /Ectopic cilia			
4. Retinal Dysplasia (RD)			geographical	14. Corneal dystrophy			
5. Hypoplastic-/Micro-papilla			choroid. hypoplasia	15. Cataract (non-congenital)			post. pol. ant sut. l.
6. Collie Eye Anomaly (CEA)			coloboma	16. Lens luxation (primary)			punctata nucleus
7. Other:				17. Retinal degeneration (PRA)			
IrideCorneal Angle Abnormality. (ICAA)			severe	18. Other:			

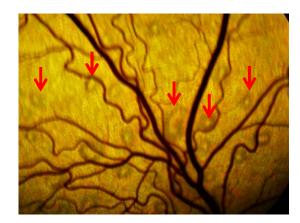
#### Interpretation

\* "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.

\*\* The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

\*\*\* The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

 Retinal dysplasia- (multi)focal: seen ophthalmoscopically as linear (vermiform), triangular, curved or curvilinear foci of retinal folding that may be single or multiple. When seen in puppies this condition may partially or completely resolve with maturity. Its significance to vision is unknown. The two other forms of retinal dysplasia (geographic and complete) which are known to be hereditary in some breeds and, in their most severe form, may cause blindness. The genetic relationship between folds and more severe forms of retinal dysplasia is undetermined



• Retinal dysplasia (RD): Linear (vermiform), triangular, curved or curvilinear foci of retinal folding that may be single or multiple seen ophthalmoscopically, the boxes 4: Retinal dysplasia and (multi)focal are ticked