Eye Morphology TCPLA_EYE_002

Purpose

To detect abnormalities in eye morphology.

Experimental Design

• Minimum number of animals: 7M + 7F

• Age at test: Week 58

• Sex: We do not expect the results of this test to show sexual dimorphism

Procedure

- 1. Examine the anterior of both eyes (e.g. with slit lamp) and record any abnormalities
- 2. Test the iris/pupil light response
- 3. Image abnormal eyes as a minimum or all eyes if capacity permits
- 4. Dilate both eyes
- 5. Examine the anterior and posterior of both dilated eyes (e.g. with slit lamp and ophthalmoscope) and record any abnormalities
- 6. Image abnormal eyes as a minimum or all eyes if capacity permits

OCT:

- 1. Turn on the OCT and start the database
- 2. Anaesthetize mouse
- 3. Prepare mouse eyes with drops and place contact lens (focal length 10 mm) on the right eye
- 4. Enter mouse data in the "Create new patient file" area and switch to the "Acquisition" window
- 5. Move the OCT camera to the right position and activate measurement modus
- 6. Place mouse collaterally to the OCT camera on the right side of a platform that is fixed in front of the OCT lens
- 7. Search the contact lens in the live picture of the fundus image field and place the pupil of the mouse eye in the centre of the window
- 8. Move the OCT camera such that OCT lens and contact lens touch each other
- 9. Focus the fundus picture by slightly moving up/down or forward/backward
- 10. Save fundus images
- 11. Set the "Ref.Arm" ruler such that the section of the retina is placed in the centre of the blue rectangle
- 12. Set the mode of measurement on "vertical, horizontal line"
- 13. Move the blue horizontal line in the fundus image field to the optic nerve level
- 14. Save images of retinal sections
- 15. Move the OCT camera to the left position

16. Repeat measurement procedure for the left eye

Scheimpflug Imaging:

- 1. Turn on the Pentacam and start the patient data management
- 2. Apply one drop 0.5% Atropine to each mouse eye for pupil dilation
- 3. Enter mouse data in the "Patient" group box and switch to the Scan menu
- 4. Activate the "1 Picture" modus in the "Image Options" area
- 5. Move Pentacam to the right position
- 6. Hold the mouse on a platform such that the vertical LED 475 nm light slit is orientated in the center of the right eye ball
- 7. Guarantee optimal focus by using the fine adjustment software tool in the adjustment window
- 8. Start imaging manually by pressing the "Start Scan" button
- 9. Scheimpflug images are saved automatically
- 10. Move Pentacam to the left position
- 11. Repeat measurement procedure for the left eye

Notes

- As a minimum, all abnormalities should be imaged.
 - Where capacity permits, all mice can be imaged
- Majority of parameters can be analysed using the standard approach for assessing categorical data. To increase power for analysis purposes, where an abnormality is detected in the left, right or both eyes, the data may be combined to generate one "abnormal" category.
- Data for both eyes is recorded under one parameter to distinguish phenotypes of incomplete penetrance in individuals and if an observation for one or both eyes cannot be made, this is recorded as 'no data'. The IMPC analysis pipeline does not take into account whether an abnormality is fully penetrant or not and the same weight is given for an abnormal observations in one or both eyes. In cases where it is not possible to confirm if an abnormality is present or not, the data is not included in the statistical analysis. The following logic is applied in determining whether to include the data in analysis:
 - If at least one of the eyes shows an abnormality in a particular parameter, the data for that specimen will be included in the statistical analysis even if the other eye is marked as "no data".
 - If the eyes are marked as "no data", or one eye is normal and the other eye is "no data" for a particular parameter the data for that specimen will not be included in the statistical analysis.

Data QC

Image QC is typically performed during data collection to ensure high quality images are captured whilst eyes are dilated etc.

Parameters and Metadata

Left corneal thickness TCPLA EYE 066 001 | v1.2

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true
Unit Measured: um

VIP of right fundus TCPLA_EYE_074_001 | v1.1

seriesMediaParameter

Req. Analysis: false Req. Upload: false Is Annotated: false

Slit Lamp Equipment Model TCPLA_EYE_032_001 | v1.2

procedureMetadata

Req. Analysis: true Req. Upload: false Is Annotated: false

Options: SL130, BQ 900 LED/IM-900, SL 990, Micron III slit lamp extension, 30 SL-M,

SL-15, SL-7E, SL30, S350, SL 139,

Topical Anesthetic TCPLA_EYE_044_001 | v1.1

procedureMetadata

Req. Analysis: true Req. Upload: true Is Annotated: false

Options: Oxybuprocain, Phenylephrine hydrochloride, Mydriacyl, Atropine sulphate,

No anesthesia, Hydrochloride, Atropine,

Corneal Sclerization TCPLA_EYE_080_001 | v1.1

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Options: no data right eye, present both eyes, no data left eye, no data left eye, present right eye, present left eye, absent, present right eye, no data for both eyes, no data right eye, present left eye,

Dilation Method TCPLA_EYE_043_001 | v1.0

procedureMetadata

Req. Analysis: false Req. Upload: true Is Annotated: false

Options: None, Tropicamide+Phenylephrin, Atropine sulphate, Atropine, Cyclopentolate hydrochloride+Phenylephrine hydrochloride, Cyclopentolate hydrochloride,

Tropicamide, Phenylephrine hydrochloride,

Min right eye lens density TCPLA_EYE_057_001 | v1.1

Req. Analysis: false Req. Upload: false Is Annotated: true

Unit Measured: %

Corneal ulcer TCPLA_EYE_085_001 | v1.0

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Options: no data for both eyes, absent, present right eye, no data left eye, present right eye, present left eye, present both eyes, no data left eye, no data right eye, no data right eye, present left eye,

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Iris/Pupil TCPLA_EYE_010_001 | v1.0

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Options: no data right eye, left eye abnormal, no data right eye, left eye abnormal, both eyes abnormal, no data left eye, no data left eye, right eye abnormal, no data for both eyes, normal, right eye abnormal,

Experimenter ID TCPLA_EYE_036_001 | v1.1

Req. Analysis: false	Req. Upload: true	Is Annotated: false
Iris transiluminatio simpleParameter	n TCPLA_EYE_082_001 v	1.1
Req. Analysis: false	Req. Upload: false	Is Annotated: true
	oth eyes abnormal, normal, no ormal, no ormal, no data right eye, right eormal, no data for both eyes,	•
Ophthalmoscope L procedureMetadata	ens Model TCPLA_EYE	E_089_001 v1.1
Req. Analysis: false	Req. Upload: false	Is Annotated: false
VIP of right eye TCP seriesMediaParameter	LA_EYE_078_001 v1.1	
Req. Analysis: false	Req. Upload: false	Is Annotated: false

Options: present both eyes, no data right eye, no data for both eyes, no data left eye, present right eye, no data left eye, absent, present left eye, no data right eye, present left eye, present right eye,

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Pupil Light Response TCPLA_EYE_014_001 | v1.0

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Options: no data right eye, left eye abnormal, no data left eye, left eye abnormal, right eye abnormal, no data left eye, right eye abnormal, no data right eye, both eyes abnormal, no data for both eyes,

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Scheimpflug description TCPLA_EYE_053_001 | v1.0

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: false

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Optical Coherence Tomography Equipment ID TCPLA_EYE_03

7_001 | v1.1

procedureMetadata

Req. Analysis: false	Req. Upload: false	Is Annotated: false		
Onhthalmoscone (Observation TCPLA_EY	/E 020 001 Lv1 1		
simpleParameter	DOSCIVATION TOPLA_ET	E_029_001 V1.1		
Req. Analysis: false	Req. Upload: false	Is Annotated: false		
Corneal deposits To simpleParameter	CPLA_EYE_081_001 v1.1			
Req. Analysis: false	Req. Upload: false	Is Annotated: true		
Options: present left eye, present both eyes, present right eye, no data left eye, no data right eye, no data for both eyes, no data left eye, present right eye, absent, no data right eye, present left eye,				
Scheimpflug Equip	ment Manufacturer	'TCPLA_EYE_041_001 v1.4		
Req. Analysis: true	Req. Upload: false	Is Annotated: false		
Options: Oculus GmbH,				

Right corneal thickness TCPLA_EYE_060_001 | v1.2

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true
Unit Measured: um

Images Slit Lamp TCPLA_EYE_051_001 | v1.1

seriesMediaParameter

Req. Analysis: false Req. Upload: false Is Annotated: false

Slit Lamp Equipment Manufacturer TCPLA_EYE_031_001 | v1.2

procedureMetadata

Req. Analysis: true Req. Upload: false Is Annotated: false

Options: MuLe, Kowa, Haag-Streit, CSO, Zeiss, Topcon, Phoenix Research Labs,

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Scheimpflug Equipment Model TCPLA_EYE_042_001 | v1.4

procedureMetadata

Req. Analysis: true Req. Upload: false Is Annotated: false

Options: Pentacam,			
Max left eye lens do simpleParameter	ensity TCPLA_EYE_055_	001 v1.1	
Req. Analysis: false	Req. Upload: false	Is Annotated: true	
Unit Measured: %			
Retinal Blood Vessels Structure TCPLA_EYE_025_001 v1.0 simpleParameter			
Req. Analysis: false	Req. Upload: true	Is Annotated: true	
Options: left eye abnormal, bo no data left eye, right eye abno no data right eye, no data for b			

General Anesthetic TCPLA_EYE_045_001 | v1.1

procedureMetadata

Req. Analysis: true Req. Upload: true Is Annotated: false

Options: No anesthesia, Ketamine+Medetomidine, Avertin, Isoflurane, Euthatal, Ketamine+Xylazine,				
Sheimpflug Lens d simpleParameter	escription TCPLA_EYE	=_052_001 v1.1		
Req. Analysis: false	Req. Upload: false	Is Annotated: false		
Right anterior chan simpleParameter	nber depth TCPLA_EYI	E_061_001 v1.2		
Req. Analysis: false	Req. Upload: false	Is Annotated: true		
Unit Measured: um				
Bulging eye TCPLA_EYE_002_001 v1.0 simpleParameter				
Req. Analysis: false	Req. Upload: false	Is Annotated: true		
Options: no data right eye, present left eye, no data left eye, absent, present both eyes, no data left eye, present right eye, no data right eye, present left eye, present right eye, no data for both eyes,				

Fusion between co	ornea and lens TCPLA	_EYE_018_001 v1.0	
Req. Analysis: false	Req. Upload: false	Is Annotated: true	
	esent left eye, no data for both eye, no data right eye, present ht eye, no data left eye,		
Pupil Position TCPL	A_EYE_011_001 v1.0		
Req. Analysis: false	Req. Upload: false	Is Annotated: true	
Options: left eye abnormal, no data left eye, right eye abnormal, normal, no data right eye, no data right eye, left eye abnormal, right eye abnormal, no data left eye, no data for both eyes, both eyes abnormal,			
B-scan of left corn seriesMediaParameter	ea and lens TCPLA_EY	/E_077_001 v1.1	
Req. Analysis: false	Req. Upload: false	Is Annotated: false	

Slit Lamp Equipment ID TCPLA_EYE_030_001 | v1.2

procedureMetadata

Req. Analysis: false Req. Upload: false Is Annotated: false

Lens TCPLA_EYE_016_001 | v1.0

simpleParameter

Req. Analysis: false Req. Upload: true Is Annotated: true

Options: no data left eye, no data for both eyes, left eye abnormal, no data left eye, right eye abnormal, no data right eye, no data right eye, left eye abnormal, right eye abnormal, normal, both eyes abnormal,

Ophthalmoscope Equipment Manufacturer TCPLA_EYE_034_001 | v1.2

procedureMetadata

Req. Analysis: true Req. Upload: false Is Annotated: false

Options: Heine / Volk, Kowa, Phoenix, Phoenix Research Labs, Haag-Streit, Heine, Keeler LTD, Karl Storz / Nikon,

Eyelid closure TCPLA_EYE_005_001 | v1.0

Req. Analysis: false Req. Upload: false Is Annotated: true Options: left eye closed, no data left eye, no data left eye, right eye closed, no data for both eyes, no data right eye, right eye closed, normal, both eyes closed, no data right eye, left eye closed, Date OCT equipment last calibrated TCPLA_EYE_049_001 | v1.1 procedureMetadata Req. Analysis: false Req. Upload: false Is Annotated: false Lens Opacity TCPLA_EYE_017_001 | v1.0

simpleParameter

Req. Analysis: false Req. Upload: true Is Annotated: true

Options: present both eyes, no data right eye, present left eye, no data left eye, present right eye, present left eye, no data for both eyes, no data left eye, absent, present right eye, no data right eye,

Optical Coherence Tomography Equipment Manufacturer

TCPLA_EYE_038_001 | v1.2

procedureMetadata

Req. Analysis: true Req. Upload: false Is Annotated: false

Vitreous TCPLA_EYE_083_001 | v1.1

Options: Bioptigen, Heidelberg Engineering,

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Options: no data left eye, right eye abnormal, no data right eye, no data for both eyes, both eyes abnormal, no data left eye, right eye abnormal, left eye abnormal, no data right eye, left eye abnormal, normal,

Ophthalmoscope Equipment Model TCPLA_EYE_035_001 | v1.2

procedureMetadata

Req. Analysis: true Req. Upload: false Is Annotated: false

Options: Sigma 150K, Genesis-DF,

Xenon Nova 175W light source + HOPKINS optic 1218AA /Nikon D5100 + 85 mm f/1.8 lens,

Genesis-D, Micron III, OMEGA 180 / Superfield NC, Genesis, SL4 4AA,

Omega 500 Unplugged, Omega 180 / 60D,

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Scheimpflug Equipment ID TCPLA_EYE_040_001 | v1.1

procedureMetadata

Req. Analysis: false Req. Upload: false Is Annotated: false

VIP of left fundus TCPLA_EYE_075_001 | v1.1 seriesMediaParameter Reg. Analysis: false Reg. Upload: false Is Annotated: false Corneal mineralization TCPLA_EYE_084_001 | v1.0 simpleParameter Req. Analysis: false Req. Upload: false Is Annotated: true **Options:** present right eye, no data right eye, absent, no data left eye, no data for both eyes, present left eye, no data right eye, present left eye, no data left eye, present right eye, present both eyes, Date Ophthalmoscope equipment last calibrated TCPLA_EYE_ 047_001 | v1.1 procedureMetadata Req. Analysis: false Req. Upload: false Is Annotated: false

Left total retinal thickness TCPLA_EYE_068_001 | v1.2

Req. Analysis: false Req. Upload: false Is Annotated: true

Unit Measured: um

Retinal Blood Vessels Pattern TCPLA_EYE_026_001 | v1.0 simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Options: no data left eye, no data left eye, right eye abnormal, left eye abnormal, both eyes abnormal, right eye abnormal, no data for both eyes, normal, no data right eye, no data right eye, left eye abnormal,

B-scan of right retina TCPLA_EYE_072_001 | v1.1

seriesMediaParameter

Req. Analysis: false Req. Upload: false Is Annotated: false

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Mean right eye lens density TCPLA_EYE_059_001 | v1.1

simpleParameter

Reg. Analysis: false Reg. Upload: false Is Annotated: true

Unit Measured: %				
Slit Lamp observat	tion TCPLA_EYE_028_001	v1.1		
Req. Analysis: false	Req. Upload: false	Is Annotated: false		
Persistence of hya .0 simpleParameter	loid vascular syste	m TCPLA_EYE_027_001 v1		
Req. Analysis: false	Req. Upload: false	Is Annotated: true		
Options: no data right eye, present left eye, no data left eye, present right eye, no data for both eyes, no data left eye, present both eyes, absent, present left eye, no data right eye, present right eye,				
Images OphthalmoseriesMediaParameter	OSCOPY TCPLA_EYE_050	_001 v1.1		
Req. Analysis: false	Req. Upload: false	Is Annotated: false		

Eye TCPLA_EYE_001_001 | v1.0

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Options: present, absent both eyes, absent right eye, absent left eye,

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Optic Disc TCPLA_EYE_023_001 | v1.0

simpleParameter

Req. Analysis: false Req. Upload: true Is Annotated: true

Options: right eye abnormal, no data left eye, no data right eye, both eyes abnormal, normal, no data right eye, left eye abnormal, left eye abnormal, no data for both eyes, no data left eye, right eye abnormal,

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B-scan of left retina TCPLA_EYE_073_001 | v1.1

series Media Parameter

Req. Analysis: false Req. Upload: false Is Annotated: false

Right total retinal thickness TCPLA_EYE_062_001 | v1.2

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Unit Measured: um			
Retina (combined) simpleParameter	TCPLA_EYE_092_001 v1.0)	
Req. Analysis: false	Req. Upload: false	Is Annotated: true	
Retinal Blood Vess	els TCPLA_EYE_024_001	v1.0	
Req. Analysis: false	Req. Upload: true	Is Annotated: true	
Options: left eye abnormal, no data right eye, both eyes abnormal, no data left eye, right eye abnormal, right eye abnormal, no data left eye, no data for both eyes, normal, no data right eye, left eye abnormal,			
VIP of left eye TCPLA	EVE 070 001 Lv1 1		
seriesMediaParameter	N_ETE_079_001 VI.I		
Req. Analysis: false	Req. Upload: false	Is Annotated: false	

Options: normal, no data right eye, left eye abnormal, no data right eye, right eye abnormal, no data left eye, both eyes abnormal, left eye abnormal, no data for both eyes, no data left eye, right eye abnormal,

Cornea TCPLA_EYE_007_001 | v1.0

simpleParameter

Req. Analysis: false Req. Upload: true Is Annotated: true

Options: left eye abnormal, no data for both eyes, no data left eye, right eye abnormal, no data right eye, both eyes abnormal, no data right eye, left eye abnormal, right eye abnormal, no data left eye, normal,

Left eye diameter TCPLA_EYE_091_001 | v1.0

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Unit Measured: mm

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Unit Measured: um

Min left eye lens density TCPLA_EYE_054_001 | v1.2

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Unit Measured: %

Iris Pigmentation TCPLA_EYE_015_001 | v1.0

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Options: normal, no data for both eyes, both eyes abnormal, no data right eye, no data right eye, left eye abnormal, no data left eye, right eye abnormal, left eye abnormal, no data left eye, right eye abnormal,

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Pupil Dilation TCPLA_EYE_013_001 | v1.0

Options: no data right eye, left eye dilated, no data right eye, no data for both eyes, no data left eye, right eye dilated, no data left eye, right eye dilated, normal, left eye dilated, both eyes dilated,

Max right eye lens density TCPLA_EYE_058_001 | v1.1

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Unit Measured: %

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Right inner nuclear layer TCPLA_EYE_063_001 | v1.2

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Unit Measured: um

Date Slit Lamp equipment last calibrated TCPLA_EYE_046_001 |

v1.1

procedureMetadata

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

Corneal opacity TCPLA_EYE_008_001 | v1.0 simpleParameter Is Annotated: true Req. Analysis: false Req. Upload: true **Options:** present right eye, absent, present both eyes, no data left eye, no data for both eyes, no data left eye, present right eye, no data right eye, no data right eye, present left eye, present left eye, **Optical Coherence Tomography Equipment Model TCPLA_EY** E_039_001 | v1.2 procedureMetadata Reg. Analysis: true Reg. Upload: false Is Annotated: false Options: Spectralis, Envisu R2200, EnvisuTM R-Series SDOIS, Left anterior chamber depth TCPLA_EYE_067_001 | v1.2 simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Unit Measured: um

Ophthalmoscope Equipment ID TCPLA_EYE_033_001 | v1.2

procedureMetadata

Req. Analysis: false	Req. Upload: false	Is Annotated: false
Left vitreous humo	our thickness TCPLA_	EYE_088_001 v1.0
Req. Analysis: false	Req. Upload: false	Is Annotated: true
Unit Measured: um		
B-scan of right cor seriesMediaParameter	nea and lens TCPLA_	EYE_076_001 v1.1
Req. Analysis: false	Req. Upload: false	Is Annotated: false

Narrow eye opening TCPLA_EYE_006_001 | v1.0

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Options: no data for both eyes, no data right eye, no data left eye, right eye abnormal, no data left eye, left eye abnormal, normal, right eye abnormal, both eyes abnormal, no data right eye, left eye abnormal,				
Left inner nuclea	r layer TCPLA_EYE_06	9_001 v1.2		
Req. Analysis: false	Req. Upload: false	Is Annotated: true		
Unit Measured: um				
Mean left eye len simpleParameter	s density TCPLA_EYE	E_056_001 v1.1		
Req. Analysis: false	Req. Upload: false	Is Annotated: true		
Unit Measured: %				

Lacrimation TCPLA_EYE_086_001 | v1.0

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true

Options: no data left eye, present right eye, no data left eye, present both eyes, no data right eye, present left eye, absent, present left eye, no data right eye, no data for both eyes, present right eye,			
	ation TCPLA_EYE_009_0	01 v1.0	
simpleParameter			
Req. Analysis: false	Req. Upload: false	Is Annotated: true	
Options: present right eye, no data right eye, present left eye, absent, present left eye, no data right eye, no data for both eyes, no data left eye, no data left eye, present right eye, present both eyes,			
Right outer nuclea	r layer TCPLA_EYE_064_	_001 v1.2	
Req. Analysis: false	Req. Upload: false	Is Annotated: true	
Unit Measured: um			

$\textbf{Date Scheimpflug equipment last calibrated} \ \ \texttt{TCPLA_EYE_048_0}$

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procedureMetadata

Req. Upload: false	Is Annotated: false
nor thickness TCPLA_	EYE_087_001 v1.0
Req. Upload: false	Is Annotated: true
nber depth TCPLA_EYE	E_071_001 v1.2
Req. Upload: false	Is Annotated: true
'TCPLA_EYE_090_001 v1.	0
Req. Upload: false	Is Annotated: true
	Req. Upload: false Req. Upload: false TCPLA_EYE_090_001 v1.

Pupil Shape TCPLA_EYE_012_001 | v1.0

simpleParameter

Req. Analysis: false Req. Upload: false Is Annotated: true **Options:** right eye abnormal, no data for both eyes, no data left eye, right eye abnormal, normal, no data right eye, left eye abnormal, no data left eye, both eyes abnormal, no data right eye, left eye abnormal, Eye Hemorrhage or Blood Presence TCPLA_EYE_003_001 | v1.0 simpleParameter Req. Analysis: false Req. Upload: false Is Annotated: true Options: no data left eye, present right eye, present right eye, no data right eye, no data left eye, no data right eye, present left eye, present left eye, present both eyes, no data for both eyes, absent, Left outer nuclear layer TCPLA_EYE_070_001 | v1.2 simpleParameter Req. Analysis: false Req. Upload: false Is Annotated: true Unit Measured: um