

COMPARATIVE VETERINARY OPHTHALMOLOGY
(938-542)

FALL SEMESTER 2009

LECTURE SCHEDULE AND CASES

**VETERINARY OPHTHALMOLOGY LECTURE AND EXAMINATION SCHEDULE
COURSE 938-542**

(Wednesdays 9:55 – 10:45 Rm 2350, Fridays 7:45-8:35 Rm 2360)

Class Period	Month	Date	Topic	Lecturer
1	September	2	Orientation – History – Ophthalmic Exam	Miller
2		4	Ophthalmic Exam	Miller
3		9	Orbit	Miller
4		11	Eyelids	Miller
5		16	Eyelids	Miller
6		18	Eyelids	Miller
7		23	Lacrimal	Bentley
8		25	Conjunctival	Bentley
9		30	Cornea	Bentley
9	October	2	Cornea	Bentley
10		7	Cornea/sclera	Bentley
11	October	9	Exam 1	Staff
12		14	Uvea	Bentley
13		16	Uvea	Bentley
14		21	Uvea	Bentley
15		23	Glaucoma	Miller
16		28	Glaucoma	Miller
17		30	Glaucoma	Miller
18	November	4	Lens	Miller
19		6	NO CLASS	
20		11	NO CLASS	
21		13	Retina	McLellan
22		18	Retina	McLellan
23		20	Retina	McLellan
24	November	25	Exam II	Staff
25		27	Thanksgiving – no class	
26	December	2	Equine Ophthalmology	Myrna
27		4	Food Animal Ophthalmology	Espinheira
28		9	Ocular Emergencies	Miller
29		11	Review Session (Optional)	Bentley
30		19	Final Exam Rooms 2350/2360	Staff

Laboratory Schedule

September 15, 2009	Small Animal Diagnostic Techniques Rm 2318 (MD1 Anatomy Lab) See Surgery Manual for schedule
December 1, 2009	OPTIONAL Large animal diagnostic techniques, 1:00-3:00 Charmany
September 22, 2009	Ophthalmic Surgery Laboratory Rm 2318 (MD1 Anatomy Lab) See Surgery Manual for schedule
September 29, 2009	Ophthalmic Surgery Laboratory Rm 2318 (MD1 Anatomy Lab) See Surgery Manual for schedule

Diagnostic Laboratories - You should wear a clean lab coat or smock for the small animal laboratories.

Surgery Laboratories –You are expected to have reviewed the surgery laboratory notes and videotape before the laboratory. Procedures will not be reviewed at the beginning of the lab.

Attendance is expected. Should you have to miss your assigned laboratory period, exchanges may be made between the two groups (A and B), however, the number of students per group must remain as originally planned so that the labs will not be overcrowded.

Required Text:

Slatter's Fundamentals of Veterinary Ophthalmology. 4th Edition, 2008, Saunders Elsevier

Instructors:

Ellison Bentley, DVM, Diplomate ACVO Course Coordinator/Clinical
Associate Professor of Ophthalmology,
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Gillian McLellan, BVMS PhD DVOphthal DECVO DACVO MRCVS, Clinical
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Ophthalmology Resident

Filipe Espinheira, DVM

Ophthalmology Resident

Course Objective:

The main objective of the course is to give you the skills necessary to provide ophthalmic care at the level of a good general practitioner.

Examination and Grading:

Exam I	- 100 points
Exam II	- 100 points
Final Exam	- 150 points
Total	350 points

Examination questions may be oral, multiple choice, true/false, fill-in-the-blank, short answer, essay, or based on Kodachrome slides. Clinical applications will be emphasized on examinations. The final examination will be based on the problem cases.

Grades will follow the standard guidelines, and will not be graded on a curve:

A	93 - 100
AB	88 - 92
B	83 - 87
BC	78 - 82
C	74 - 77
D	70 - 73
F	69 and below

All procedural/scheduling questions should be directed to Ellison Bentley. Questions regarding a particular lecture should be first directed to the lecturer. If the lecturer is not available then anyone of us will be happy to try to answer them for you.

5. Accommodation for Disabilities

Only students with documented disabilities will be eligible to receive reasonable accommodation for their disability. It is the responsibility of the student to inform the course coordinator of their needs as soon as possible (ideally before the course begins). Students who do not inform the course coordinator (Dr. Bentley) of their special needs prior to **September 19, 2009**, may not be provided accommodation. Because of the nature of the subject material in veterinary ophthalmology, accommodation(s) that were granted for other courses in the SVM may not be appropriate or reasonable for this course, and the student should not assume that previous accommodation(s) in other courses will automatically apply to this course.

6. Final Exam Case-based Format:

Questions will be based on problem cases and may be multiple choice, true/false, fill-in-the-blank, or short answer in nature. For each case you will be provided the initial information about the case e.g., the signalment, history and results of a complete or partial ophthalmic examination. Using this information you will be asked to answer specific questions about the case. In addition to exactly repeating the previous information, new material about the case may be provided on the examination. Photographs may also be used.

Example:

A 3 year-old Golden Retriever is presented for evaluation of inappetence, lethargy, a soft moist cough and a red, painful eye of 7 days duration. Three weeks previously the dog and owners had returned to Madison from a vacation in northern Wisconsin. The dog also spent 3 months in Arizona during the previous winter. Physical examination reveals lethargy, moderately enlarged peripheral lymph nodes, serosanguineous discharge from multiple 1 cm diameter ulcers on the skin, and harsh lung sounds. T: 41.3 C; P 148 bpm; R: 26/min. There are no signs of ocular trauma in either eye. Ophthalmic examination reveals:

	OD	OS
Menace	normal	absent
Dazzle	normal	absent
PLR	sluggish, incomplete	dilated, unresponsive
Pupil	miotic	dilated
STT	21 mm/min	23 mm/min, mucopurulent discharge
IOP	4 mm Hg	57 mm Hg, buphthalmos
Cornea	trace edema	diffuse 2+ edema
Sclera	trace injection	4+ episcleral injection
Aqueous	2+ flare	4+ flare
Lens	clear	fibrin on ant capsule
Vitreous	clear	hazy
Fundus	what is visible = normal	not visible

Be prepared to list the most likely differential considerations, indicated diagnostic tests, treatment options etc.

1. Identify initial concerns/questions:

- a. Inappetence
- b. Lethargy
- c. Soft moist cough
- d. Red eye

2. Organize available information - outlined in case above

3. State Problems - Problem list:

- a. Systemic: lymphadenopathy, febrile, lethargy, harsh lung sounds, skin ulcers.
- b. OD: Red eye characterized by abnormal PLR, miotic pupil, low IOP, aqueous flare - Together these changes are indicative of anterior uveitis.

- c. OS: Red eye characterized by loss of vision, dilated pupil, increased IOP, diffuse corneal edema, episcleral injection, aqueous flare, vitreal debris, buphthalmos -Together these changes are indicative of panuveitis and secondary glaucoma.

4. Differential Considerations (ranked in approximate order - be as specific as possible):

- a. Systemic:
 - 1. Lymphadenopathy; neoplasia, systemic infectious disease, immune mediated diseases.
 - 2. Fever: systemic infectious disease, neoplasia, immune mediated disease, pulmonary thromboembolism, inflammatory disease.
 - 3. Lethargy: nonspecific clinical sign of generalized illness.
 - 4. Harsh lung sounds: systemic infectious disease, neoplasia, interstitial pulmonary disease, hypoxia.
 - 5. Skin ulcers: systemic infectious disease, immune-mediated dermatoses, cutaneous neoplasia.
- b. OD - The findings are diagnostic for anterior uveitis. Differentials for anterior uveitis include:
 - 1. Fungal – Blastomycosis, coccidioidomycosis, cryptococcosis, histoplasmosis, others
 - 2. Neoplastic and Paraneoplastic - lymphosarcoma, intraocular melanomas/adenomas, metastatic tumors (hemangiosarcoma), histiocytic proliferative disease, hyperviscosity syndrome), GME
 - 3. Immune-mediated - VKH, immune-mediated vasculitis, cataracts (lens-induced uveitis), Immune-mediated thrombocytopenia, lens trauma.
 - 4. Idiopathic - probably immune mediated
 - 5. Miscellaneous - toxemia from any cause (pyometra), coagulopathy, deep necrotizing or non-necrotizing scleritis, drug induced (especially mitotic agents), idiopathic, radiation therapy, trauma, ulcerative keratitis
 - 6. Bacterial - Brucella canis, Leptospira spp. Borrelia burgdorferi (suspected), any septicemia or severe periodontal disease (spirochetes?)
 - 7. Parasitic - Dirofilaria immitis, ocular larval migrans (Toxocara, Balisascaris), ophthalmomyiasis interna (Diptera).
 - 8. Protozoan - Toxoplasma gondii, leishmania donovani
 - 9. Rickettsial - Ehrlichia canis or platys, Rickettsia rickettsii
 - 10. Viral - adenovirus 1, distemper virus, herpesvirus, rabies.
 - 11. Metabolic - Diabetes mellitus (cataracts and LIU), systemic hypertension
 - 12. Algal - Prototheca spp - rare
 - 13. Trauma
- c. OS - The findings are diagnostic for panuveitis and secondary glaucoma. Same differentials as for OD.

5. Diagnostic Plan: - consider all differentials, both systemic and ocular when formulating a plan.

Begin with less invasive procedures.

- 1. Cytology of draining skin ulcers.
- 2. Chest radiographs.
- 3. Ultrasound of OS.

4. FNA and cytology of a peripheral lymph node.
5. CBC, serum Biochemical profile, UA.
6. Transtracheal wash and cytology.
7. Vitreous paracentesis of OS for cytologic examination.
8. Titers for blastomycosis, coccidiomycosis, cryptococcosis if above are negative.

6. Initial Treatment:

- a. Systemic fungal: itraconazole, fluconazole, amphotericin B
- b. Metastatic/systemic neoplasia: Chemotherapy
 - lymphosarcoma: stage V -- COP or COPLA protocol
 - mast cell tumor: prednisone 60 mg/m² for 7 day or CVP protocol
 - hemangiosarcoma: no effective therapy
- c. OD: topical 0.1% dexamethasone ophthalmic ointment q 4 hrs for 7 days, topical 1% atropine solution BID until pupil is dilated then prn to maintain dilation.
- d. OS: enucleation to relieve pain in this irreversibly blind eye. Alternatively consider 0.1% dexamethasone q 4 hrs, and antiglaucoma therapy consisting of oral methazolamide and topical 0.5% timolol TID. No atropine.

7. Follow-up/Monitor - Additional information may be provided.

- a. OD: at 1 week the uveitis has clinically resolved. Discontinue atropine, decrease 0.1% dexamethasone to q6 hrs for 2 days then taper slowly over next 2 weeks. Recheck weekly.
- b. OS: IOP = 65 mm Hg on medical therapy. Recommend enucleation.

Sample Questions:

1. The problem list for the left eye can be best summarized as:
 - a. Inflammation of the entire uveal tract (panuveitis) and secondary glaucoma
 - b. Anterior uveitis
 - c. Corneal endothelial decompensation
 - d. Episcleritis
 - e. Drug induced mydriasis
2. The best differential diagnosis list includes.
 - a. Trauma, canine adenovirus 1, prototheca
 - b. Canine herpesvirus 1, leptospirosis, disseminated staphylococcal septicemia
 - c. Blastomycosis, Coccidiomycosis, cryptococcosis, lymphosarcoma
 - d. Disseminated mast cell tumor, hemangiosarcoma, uveodermatologic syndrome (VKH)
 - e. Borreliosis, toxoplasmosis, leishmaniasis
3. You perform a CBC, biochemical profile, skin impression smears for cytologic examination, and thoracic radiographs. The blood work is normal. Thoracic rads show a generalized broncho-interstitial pattern. The impression smears are characterized as pyogranulomatous but no organisms are observed.

The most likely etiologic diagnosis is:

- a. Lymphosarcoma
- b. Uveodermatologic syndrome

- c. Systemic mastocytosis
- d. Blastomycosis or coccidiomycosis
- e. Disseminated staphylococcal infection

What is the most appropriate treatment for the OS?

- a. Enucleation and histopath
- b. Evisceration and silicone intraocular prosthesis
- c. Laser cyclophotocoagulation, dichlorphenamide, topical corticosteroids
- d. IV mannitol, oral dichlorphenamide, topical pilocarpine
- e. Oral corticosteroids, oral glycerin, azathioprine.

Case 1.

Signalment: "Abe", a 26 kg, 3 year-old, intact male, liver and white, field trial English Springer Spaniel.

Past History: Unremarkable except for occasional brief episodes of vomiting after ingesting pheasant feathers while hunting.

History of Current Problem: Inappetence and a protruding right eye for several days. He had been hunting in Montana the previous weekend and had won the trial.

Physical Examination: T 103.8F, P 138, R panting. He attempts to bite you when you try to open his mouth. The eye is difficult to retropulse into the orbit. The remainder of the physical examination is normal except for a few burr-dock seeds trapped in the hair over his abdomen.

	OD	OS
Menace	reduced	normal
Dazzle	present	normal
Blink reflex	present but hard for lids to cover globe	normal
PLR	normal	normal
Discharge	mod mucopurulent	none
Lids	swollen, red, 4 distichia	2 distichia
Nictitans	hyperemic/elevated	normal
Cornea	diffuse 3+ edema	normal
Sclera	3+ episcleral injection	normal
Aqueous	2+ flare	normal
Pupil	miotic	normal
Lens	poorly seen	clear
Vitreous	poorly seen	clear
Fundus	poorly seen	normal
STT	23 mm/min	17 mm/min
Fluorescein	diffusely +ve axially	negative
IOP	7 mm Hg	14 mm Hg

Define the problems, develop a differential diagnosis list and diagnostic plan, and describe how the case should be initially managed pending the results of additional diagnostic tests.

Case 2

Signalment: "Pukie" a 2 kg, 5-month-old, Tortishell, F, DSH, farm/indoor cat.

Past History: She was obtained last week by a veterinary student while visiting a farm on her ambulatory rotation. She has been treated for roundworms and fleas and vaccinated once for Rhinotracheitis, Calicivirus and Feline Panleukopenia. She obtained her name because it was noted she routinely vomits after drinking cow's milk.

History of Current Problem: She has a unilateral mucopurulent ocular discharge that has not improved with 2-3 times a day topical Neomycin, Polymyxin B, and Bacitracin ophthalmic ointment.

Physical Examination: Normal except for ophthalmic disease.

	OD	OS
Menace/Dazzle	normal	normal
Blink/PLR	normal	normal
Discharge	mod mucopurulent	none
Lids	blepharospasm	normal
Nictitans	hyperemic/elevated	normal
Conjunctiva	hyperemic 2+ chemosis/follicles	normal
Cornea/Aqueous	normal	normal
Iris/Pupil	normal	normal
Lens/Fundus	normal	normal
STT	18 mm/min	12 mm/min
Fluorescein	negative	negative
IOP	14 mm Hg	12 mm Hg

Define the problems, develop a differential diagnosis list and diagnostic plan, and describe how the case should be initially managed pending the results of additional diagnostic tests.

Case 3

Signalment: "Casey", a 14 kg, 5-year-old, neutered female, Buff, American Cocker Spaniel.

Past History: Chronic otitis externa and seborrhea treated by another veterinarian with some "ear-drops", "some pills", and baths. With careful questioning the owners states that at about 6 months of age "some red bumps popped up in the inner corner of each eye and that the vet just cut them off in the office".

History of Current Problem: Off and on for the last year she also has been treated with "some antibiotic-cortisone eyedrops 2-3 times a day" for "excessive discharge". The eye medication helps but the problem recurs shortly after the drugs are discontinued. In the last month she occasionally bumps into things during the day and the owners wants a second opinion from you. They are hoping you can resolve the problem once and for all, preferably with a pill.

Physical examination: Chronic yeast and bacterial (rod) otitis externa. Seborrhea with secondary pyoderma.

	Both eyes appear the same
Menace	present but ↓
Dazzle	present
Blink reflex	present but ↓
PLR	normal (but hard to see pupil)
Discharge	thick, yellow mucopurulent sticking to cornea
Lids	lower lid ectropion, dried discharge on lashes
Nictitans	thickened and 3+ hyperemic
Conjunctiva	thickened and 3+ hyperemic
Cornea	heavily pigmented, vascularized and scarred

Develop a problem list, differential diagnosis list and diagnostic work-up strategy.

Case 4:

Signalment: "Arie" a 4-year-old, tabby, M-N, Maine Coon, 7.6 kg, indoor/outdoor cat

Past History: In the past few months Arie has not been interested in going outdoors. The owner attributes this reluctance to fear of a more aggressive cat living next door.

History of Current Problem: The left eye has had chronic discharge for approximately 2 months. Two weeks ago the owner noted a "blister" in the central cornea which she treated with "an eye medication my mother used for her own pink-eye" without improvement. In the last few days she has noted a brown spot on the eye that is resistant to her attempts to wipe it off with a tissue.

Physical Examination: Unremarkable except for the ocular disease.

	OD	OS
Menace	decreased	decreased
Dazzle	decreased	decreased
Blink reflex	normal	normal
PLR	slow and incomplete	slow and incomplete
Maze testing	bumps into things in dim light	avoids objects in normal room light
Discharge	none	dried, blackish
Lids	normal	entropic
Nictitans	normal	hyperemic
Cornea	normal	4 mm diameter black axial opacity
Conjunctiva	normal	hyperemic
Aqueous	normal	normal
Pupil	dilated	dilated
Lens	normal	normal
Vitreous	normal	normal
Fundus	OU - diffusely hyper-reflective with vascular attenuation	
STT	12 mm/min	8 mm/min
Fluorescein	negative	positive over black lesion
IOP	21 mm Hg	15 mm Hg

Develop a problem list, differential diagnosis list, diagnostic plan and initial treatment plan pending the results of any work-up that you elect to perform.

Case 5:

Signalment: 6 year-old, bay Quarterhorse mare

Past History: Had her first foal 1 year ago. Otherwise unremarkable.

History of Current Problem: 12 days previously the left eye was tearing and the owner called your associate out to examine the horse. At that time it had a 2-mm epithelial defect as if the eye had sustained a partial thickness stromal puncture. Your associate recommended treatment with topical neomycin, bacitracin and polymyxin B ointment 3 times a day and 1% atropine ointment twice a day. Upon recheck in 3 days the epithelial defect had healed but a "white spot" remained at the old ulcer site. Your associate advised continuing the topical antibiotics and rechecking in 5 days but the owner discontinued the medications because it was difficult to treat the mare 3 times a day. The owner now calls you out because the white spot has gotten much bigger and the eye is tearing and blepharospastic.

Physical Examination: Unremarkable except for the left eye.

	OD	OS
Menace/Dazzle	normal	normal
Blink reflex	normal	normal
PLR	positive direct	absent direct (miosis)
	positive consensual	absent consensual
Discharge	none	2+ mucopurulent
Lids	normal	normal
Nictitans	normal	hyperemic
Cornea	normal	8 mm diameter area of dense white infiltrate, ulcer 1/3 depth of cornea 5mm ciliary flush
Conjunctiva	normal	3+ hyperemia, 1+ chemosis
Aqueous	normal	2+ aqueous flare, some fibrin
Pupil	normal	marked miosis
Lens	normal	not visible
Fundus	normal	not visible
Fluorescein	negative	8 mm positive lesion over infiltrate

Develop a problem list, differential diagnosis list, diagnostic plan and initial treatment plan pending the results of any work-up you elect to perform.

Case 6

Signalment: "Ember" a 8-year-old, grey/white, F-S, DSH, 4.5 kg, indoor cat

Past History: Unremarkable, current on vaccines.

History of Current Problem: The owners noted approximately 2 months ago that the left pupil was irregular in shape and that the "colored part" of her eye looked darker.

Physical Examination: Unremarkable except for the ophthalmic disease.

	OD	OS
Menace/Dazzle	normal	normal
Blink reflex	normal	normal
PLR	normal (direct and consensual)	present but incomplete (direct and consensual)
Discharge	none	mild serous
Lids	normal	normal
Nictitans	normal	slightly hyperemic
Conjunctiva	normal	mild hyperemic
Cornea	normal	normal
Anterior chamber	normal	shallow, not of uniform depth
Aqueous	normal	1+ aqueous flare
Pupil	normal	dyscoric
Lens	normal	fibrin/cells on ant capsule
Vitreous	normal	poorly visible
Fundus	normal	poorly visible
STT	12 mm/min	15 mm/min
Fluorescein	negative	negative
IOP	16 mm Hg	23 mm Hg

Develop a problem list, differential diagnosis list, diagnostic plan and initial treatment plan pending the results of any work-up you elect to perform.

Case 7

Signalment: "Binky", a 35 kg, 8 year-old, neutered male, black and tan German Shepherd.

Past History: She takes carprofen daily for hip dysplasia associated osteoarthritis

History of Current Problem: For 4 weeks the owner has been treating the eyes with Visine from a local pharmacy in an effort to rid the dog of its "red eye". She reports it makes some of the redness go away but this lasts only for a few hours.

Physical Examination: Limp on both rear legs. Otherwise unremarkable. Both eyes appear identical

	OU
Menace/Dazzle	present
Blink/PLR	normal
Discharge	2+ mucoid to mucopurulent
Lids	normal
Nictitans	Thickened, hyperemic, focal areas of depigmentation
Cornea	Dense, proliferative neovascularization in the inferior-temporal limbal region extending over half of the pupil.
Sclera	Injected in the inferior-temporal perilimbal region.
STT	OD: 21 mm/min, OS 18 mm/min
Fluorescein	negative OU
IOP	OD: 12 mm Hg, OS 14 mm Hg

Develop a problem list, differential diagnosis list, diagnostic plan and initial treatment plan pending the results of any work-up you elect to perform.

Case 8

Signalment: "Tessie" a 435 kg, 8 year-old, Thoroughbred mare

Past History: The mare is presented to you for a pre-purchase examination by the current owner at the request of the prospective buyer. The current owner says the horse has been fine except for occasional episodes of tearing which improve when the nasolacrimal system was flushed by another veterinarian. They attribute the problem to a dusty stall and paddock the horse is housed in.

History of Current Problem: Pre-purchase examination with the intended use as a hunter-jumper.

General Physical Examination: Unremarkable except for the eyes.

	OD	OS
Menace/Dazzle	present	present
Blink reflex	normal	normal
PLR	intact but incomplete	intact but incomplete
Discharge	mild serous	normal
Lids/Nictitans	normal	normal
Conjunctiva	trace injection	normal
Cornea	mild diffuse edema	normal
Aqueous	1+ aqueous flare	normal
Pupil	OU - dyscoric with numerous posterior synechia	
Lens	OU - fine anterior capsular and cortical opacities	
Vitreous	liquefied with floaters	normal
Fundus	"Butterfly peri-papillary area of altered reflectivity	normal
Fluorescein	negative	negative

Develop a problem list, differential diagnosis list, diagnostic plan and initial treatment plan (if any) pending the results of any work-up you elect to perform. Also describe what you would tell the prospective buyer about the suitability/prognosis for this horse.

Case 9

Signalment: "Sadie" a 29 kg, 5-year-old neutered female, black and white, Siberian Husky

Past History: Current on vaccinations.

History of Current Problem: Sadie has become acutely blind in the last 12 hours. The owners also report periodic episodes of redness and squinting. These episodes have been occurring for the past few months in the left eye and the last few days in the right eye. She also has not been eating very well in the last few months and acts "crabby" towards the small child in the house. They hadn't sought care before because the family had been traveling extensively due to the husband's military obligations.

Physical examination: No abnormalities other than those affecting the eyes.

	OD	OS
Globe size	normal	buphthalmia
Menace	absent	absent
Dazzle	absent	absent
Blink reflex	present	present
PLR	absent	absent
Discharge	moderate serous	moderate serous
Lids	mild ectropion	mild ectropion
Nictitans	hyperemic/elevated	hyperemic/elevated
Cornea	3+ diffuse edema	2+ diffuse edema
Conjunctiva	4+ deep injection	2+ deep injection
Aqueous	normal	normal
Pupil	dilated	dilated
Lens	normal	sub-luxated for 2 clock-hours
Vitreous	normal	normal
Fundus	normal	cupped optic nerve, altered reflectivity
Fluorescein	negative	faint positive in a horizontal axial band
IOP	50 mm Hg	35 mm Hg

Develop a problem list, differential diagnosis list, diagnostic plan and initial treatment plan (if any) pending the results of any work-up you elect to perform.

Case 10

Signalment: "Kliene", a 16 year-old, spayed female, orange tabby, 3.5 Kg DSH

Past History: She is housed exclusively indoors. Eight years previously the cat had an episode of chylothorax that resolved over several months with repeated chest taps. The owner reports intermittent periods of anorexia over the past 2 years and that the cat has lost about 0.5 kg over that time.

History of Current Problem: 2 days prior to presentation the cat began to bump into things occasionally and the owner noted the pupils looked dilated.

Physical Examination: The cat appears somewhat thin and had a tachycardia (HR > 200 beats/min) a split second heart sound and coarse lung sounds.

	OD	OS
Menace	absent	questionable
Dazzle	none	present
Blink reflex	normal	normal
PLR	absent direct present consensual	positive direct no consensual
Discharge	none	none
Lids/nictitans	normal	normal
Cornea/conjunctiva	normal	normal
Aqueous	1+ flare small hyphema	normal
Pupil	dilated	dilated
Lens	normal	normal
Vitreous	lg hemorrhage	small hemorrhage
Fundus	extensive retinal/ subretinal hemorrhage	mild retinal hemorrhage
Fluorescein	negative	negative
IOP	12 mm Hg	16 mm Hg

Develop a problem list, differential diagnosis list, diagnostic plan and initial treatment plan (if any) pending the results of any work-up you elect to perform.

Case 11

Signalment: "Stormy" a 11 kg, 8-month-old, neutered male, American Eskimo dog.

Past History: Up-to-date on vaccines. Neutered at 6 months of age.

History of Current Problem: He presents for evaluation for an eye "sticking out of the head". This occurred during a fight with their other dog (a Rottweiler).

Physical examination: He acts extremely painful and excited. T 102.8, P190, R panting. Two small puncture marks are noted in the fur above and below the eye.

	OD	OS
Globe	normal	proptosed
Menace	normal	absent
Dazzle	normal	questionable
Blink reflex	normal	can't close lids
PLR	positive direct	absent direct (miosis)
	positive consensual	absent consensual
Discharge	none	serosanguinous
Lids	normal	trapped behind globe
Nictitans	normal	hyperemic
Cornea	normal	mild edema axially
Conjunctiva	normal	hyperemic/chemotic
Aqueous	normal	2+ flare, small hyphema
Pupil	normal	markedly miotic
Lens	normal	not visible
Fundus	normal	not visible

Develop a problem list, differential diagnosis list, diagnostic plan and initial treatment plan (if any) pending the results of any work-up you elect to perform.

Consider differential diagnosis, treatment options, prognosis.

Case 12

Signalment: "Tundra" a 38 kg, 8-year-old, neutered female, Samoyed dog.

Past History: Up-to-date on vaccines. Neutered at 6 months of age.

History of Current Problem: Her owner complains that the left eye, and then the right eye "clouded" up in the past few weeks and now she appears blind. She lives outside with another dog on their dairy farm and her owner thinks that she is otherwise fine.

Physical examination: She is moderately obese. T 102.3, P140, R panting. Fleas.

	OD	OS
Globe	normal	normal
Menace	reduced	reduced
Dazzle	present	present
Blink reflex	normal	normal
PLR	positive direct	positive direct
	positive consensual	positive consensual
Discharge	mild serous	mild serous
Lids	normal	normal
Nictitans	normal	normal
Cornea	normal	normal
Conjunctiva	II/IV injection	II/IV injection
Aqueous	1+ flare	1+ flare
Pupil	normal	normal (photos show post-dilation)
Lens	opaque	opaque
Fundus	not visible	not visible
Schirmer tear	19 mm/min	21 mm/min
Fluorescein	Negative	Negative
IOP	6 mm Hg	8 mm Hg

Develop a problem list, differential diagnosis list, diagnostic plan and initial treatment plan (if any) pending the results of any work-up you elect to perform.

OPHTHALMIC EXAMINATION LABORATORY

- A. Consider the animal's signalment (Species, Breed, Coat color, Age and Sex)
- B. History - See history form
- C. Examination – See examination form
 - 1. **Setting** - A quiet, darkened room
 - 2. **Equipment** - focal illumination such as a Finoff transilluminator
 - 3. **Restraint** - The less the better. Auriculopalpebral nerve block and sedation for large animals.
 - 4. **Preliminary Observations** - observe the animal moving around the stall/exam room, facial symmetry, the gross size and shape of the orbit/globe, the position of the eyelids and adnexal structures, and the presence of any ocular discharge or opacity.
 - 5. **Close Inspection** - Steady the head. If orbital disease is present retropulse the globe, open the mouth to examine the pytergopalatine fossa caudal to the last molar and to check for pain. Perform a neurophthalmic exam:
 - a. **Menace response** – hand movements elicit a blink response
 - b. **Cotton ball test** – visual animals follow a cotton-ball
 - c. **Blink reflex** – touching the periocular area should elicit blinking
 - d. **Corneal reflex** - touch the cornea with a wisp of cotton.
 - e. **Doll's eye reflex** - Move the head side to side and up and down
 - f. **Dazzle reflex** – A very bright light shone into the eye should elicit blinking
 - 6. **Anterior Segment Examination**
 - a. **Finoff transilluminator or direct ophthalmoscope at 0 diopters - establish both tapetal light reflexes from arm's distance.** Note relative pupil sizes and any media opacities.
 - b. **Direct and consensual pupillary light reflex.**
 - c. **Use direct, oblique and retroillumination.**
 - d. **Identify:** eyelids, eyelid margin, cilia, meibomian gland openings, the anterior surface of the third eyelid, the bulbar and palpebral conjunctiva, the pre-corneal tear film (a bright reflection from the ocular surface), the cornea, depth and clarity of the anterior chamber, the color size and shape of the iris/pupil, and the lens. Lesions involving the inferior portion of the globe can be seen by pointing the animal's nose to the ground.
 - e. Use a **slit-beam penlight or the small circle option of the direct ophthalmoscope** to obliquely illuminate the eye and create an optical cross section of the eye. Note the **tear film/cornea, anterior chamber, iris, lens and vitreous.**
 - f. Lesions are localized by:
 - 1) **Object overlay** - Anterior structures cover those located more posteriorly.
 - 2) **Optical cross-section with a slit-beam light (Purkinje images).**
 - 3) **Axis of rotation** – Lesions anterior to the lens nucleus move in the same direction as the globe whereas lesions posterior to the lens nucleus move in the opposite direction.
 - 4) **Dioptric setting of the direct ophthalmoscope** – the fundus is in focus at 0 diopters, posterior lens at +8D, anterior lens at +12D and cornea at +20D.
 - 7. **Posterior Segment Exam** – Identify: Tapetum, non-tapetum, optic nerve and blood

vessels

- 1). **Direct Ophthalmoscopy** – Start at OD and view the tapetal reflection from about 18-24 in from the animal's eye. Continue to view the tapetal reflection as you move within 1-2 in of the animal's cornea and adjust the dioptric settings until the fundus comes into clear focus. The image is upright. Adjustments:
 - a). **Light intensity** – Turn the knurled knob.
 - b) **Viewing Apertures** - large circle = large pupil, small circle = small pupil. Slit = Purkinje images and optic nerve head elevation or depression. Grid measures lesions. Green filter is red-free and differentiates melanin pigment (brown) from blood (looks black). Blue filter excites fluorescein.
 - c). **Dioptric power** - The black (or green) numbers = converging lenses and bring nearer objects in focus. The red or negative (diverging) lenses are used to correct for near-sightedness on the part of the observer (if not wearing glasses) or animal.
- 2). **Monocular Indirect Ophthalmoscopy** - Hold a bright focal light (usually with the right hand) against your lateral canthus/cheek and establish the tapetal reflex. A 20- or 28-diopter lens is held in the left hand between the thumb and index finger, and the left ring finger and pinky are used to retract the upper lid. Initially the lens is held to one side of the eye until the tapetal reflex is seen, and then it is rotated such that the fundus can be seen. Usually the lens is first held about 1/2 inch from the eye and then slowly pulled towards you until the image of the fundus fills the lens (usually about 1 inch away from the animal's eye). When the image is lost (usually because you or the animal moved), the lens is rotated away from the eye (the left ring finger and pinky continue to hold up the upper lid), the tapetal reflex is re-established and the lens rotated again so the fundus is visible. The image is upside down and backwards.
- 3). **Binocular Indirect Ophthalmoscopy** – A special headset with attached light source is used to split the image so that it may be viewed with both eyes (hence better depth perception) and both hands are freed up to manipulate the animal and the lens.

D. Additional Diagnostics -

1. **Bacterial culture and sensitivity** - Do before placing anything into eye. Wipe out excess debris prior to collecting the sample. Culture affected tissue only.
2. **Schmer Tear Test** - mm of wetting/60 sec. Do pre-fluorescein staining or topical anesthesia.
3. **Conjunctival/Corneal cytology** – Requires topical anesthesia. Use the butt-end of a sterile scalpel blade, a chemistry spatula or Kimura platinum spatula. Make 3 slides. Collect prior to fluorescein staining if going to do IFA testing for feline herpesvirus or chlamydia. Scrapings may also be cultured or submitted for PCR testing for feline herpesvirus etc.
4. **Fluorescein staining**
 - a. **For corneal/conjunctival epithelial defects**
 - b. **Jones test for nasolacrimal patency**
 - c. **Tear Film Break-up Time**
 - d. **Seidel test** – If a leaking corneal wound is suspected.
6. **Nasolacrimal flush** - Requires topical anesthesia. For dogs, cats, and cattle cannulate the superior puncta with a 22-24 gauge IV catheter attached to a saline-filled 3-5 ml

syringe. Saline first comes out the inferior puncta. Occlude the inferior puncta by digital pressure through the skin in the medial canthus. Continued flushing now results in saline exiting via the nares or into the pharynx.

- 7. Eversion of the eyelids/nictitans.** Requires topical anesthesia. A fine, curved mosquito hemostat or a Jameson muscle hook can be used to gently retract the lids away from the globe. A 1X2 Addson Brown forceps can be used to grasp the anterior conjunctival surface of the nictitans and pull it away from the globe. Grasp the conjunctiva of the nictitans about 2-3 mm away from the margin (avoid grabbing the cartilage).
- 8. Tonometry** – Requires topical anesthesia. Schiotz or Tono-Pen. Do prior to pupil dilation.