

# INCREASED & DECREASED INTRAOCULAR PRESSURE

**Alison Clode, DVM, DACVO**  
 Port City Veterinary Referral Hospital  
 Portsmouth, New Hampshire

**PATIENT PRESENTED WITH BLIND, PAINFUL, CLOUDY, AND/OR RED EYE**

- Perform ophthalmic examination
- ▶ Menace response
  - ▶ Reflexes (eg, dazzle, direct and consensual PLR, palpebral)
  - ▶ Schirmer tear test
  - ▶ Fluorescein stain
  - ▶ Anterior segment examination
  - ▶ Posterior segment examination
  - ▶ Tonometry

Determine IOP

Increased IOP (>20 mm Hg)

Normal IOP (10-20 mm Hg)

Decreased IOP (<10 mm Hg)

- Confirm increased IOP
- ▶ Calibrate tonometer
  - ▶ Check collar/harness tightness
  - ▶ Minimize manual restraint (eg, pressure on neck and around eyes)

Cause of observed ophthalmic changes is other ocular (or CNS) condition, not glaucoma or uveitis

- Confirm decreased IOP
- ▶ False-low readings are rare
  - ▶ Calibrate tonometer
  - ▶ Minimize manual restraint
  - ▶ Consider age (mild IOP reduction [generally no more than 1-3 mm Hg] may be considered normal in older dogs and cats)

**INCREASED**

**NOT INCREASED**

**DIAGNOSIS**  
Glaucoma

Go to **Normal IOP (10-20 mm Hg)** or **Decreased IOP (<10 mm Hg)**, based on IOP

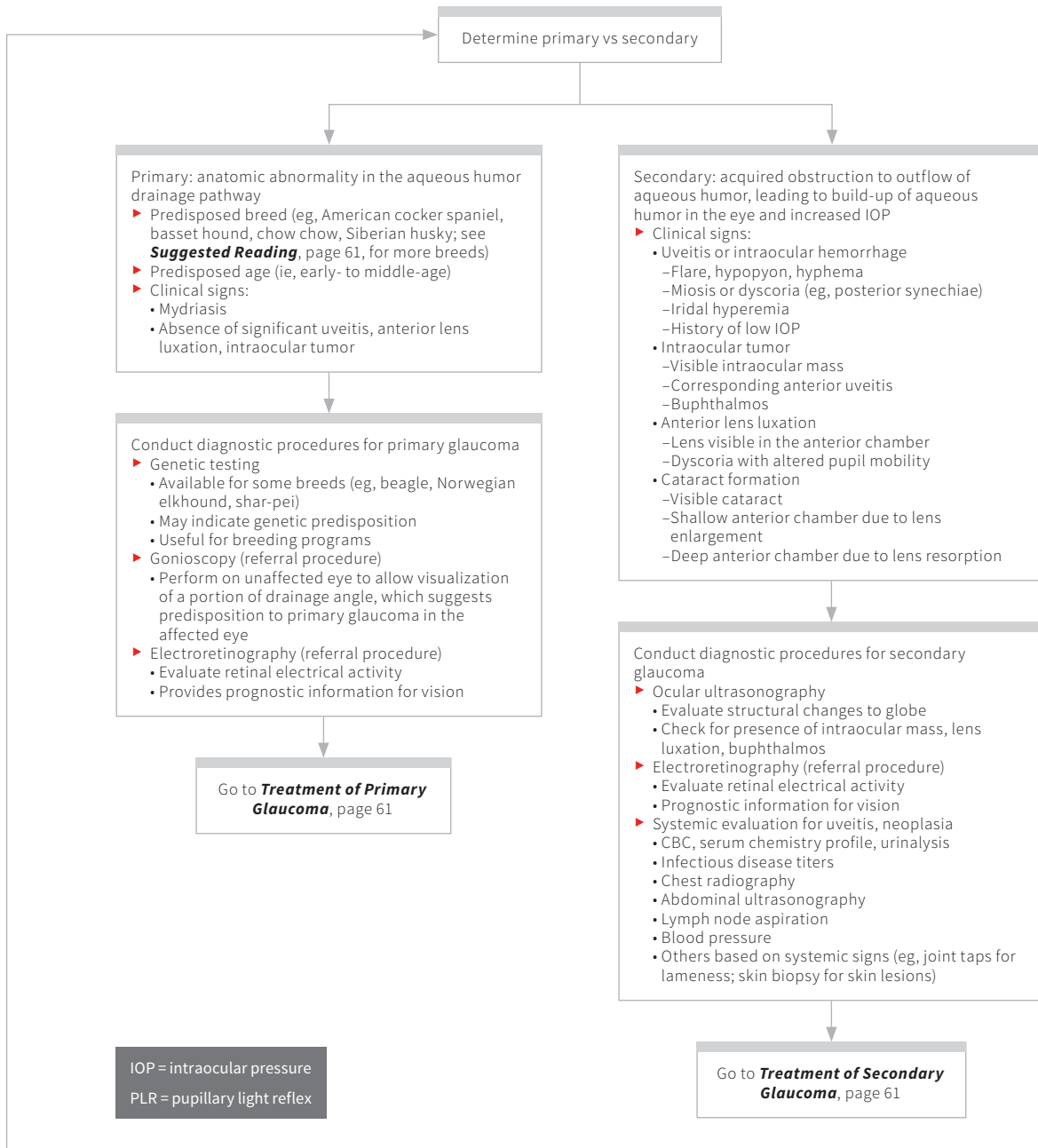
**DECREASED**

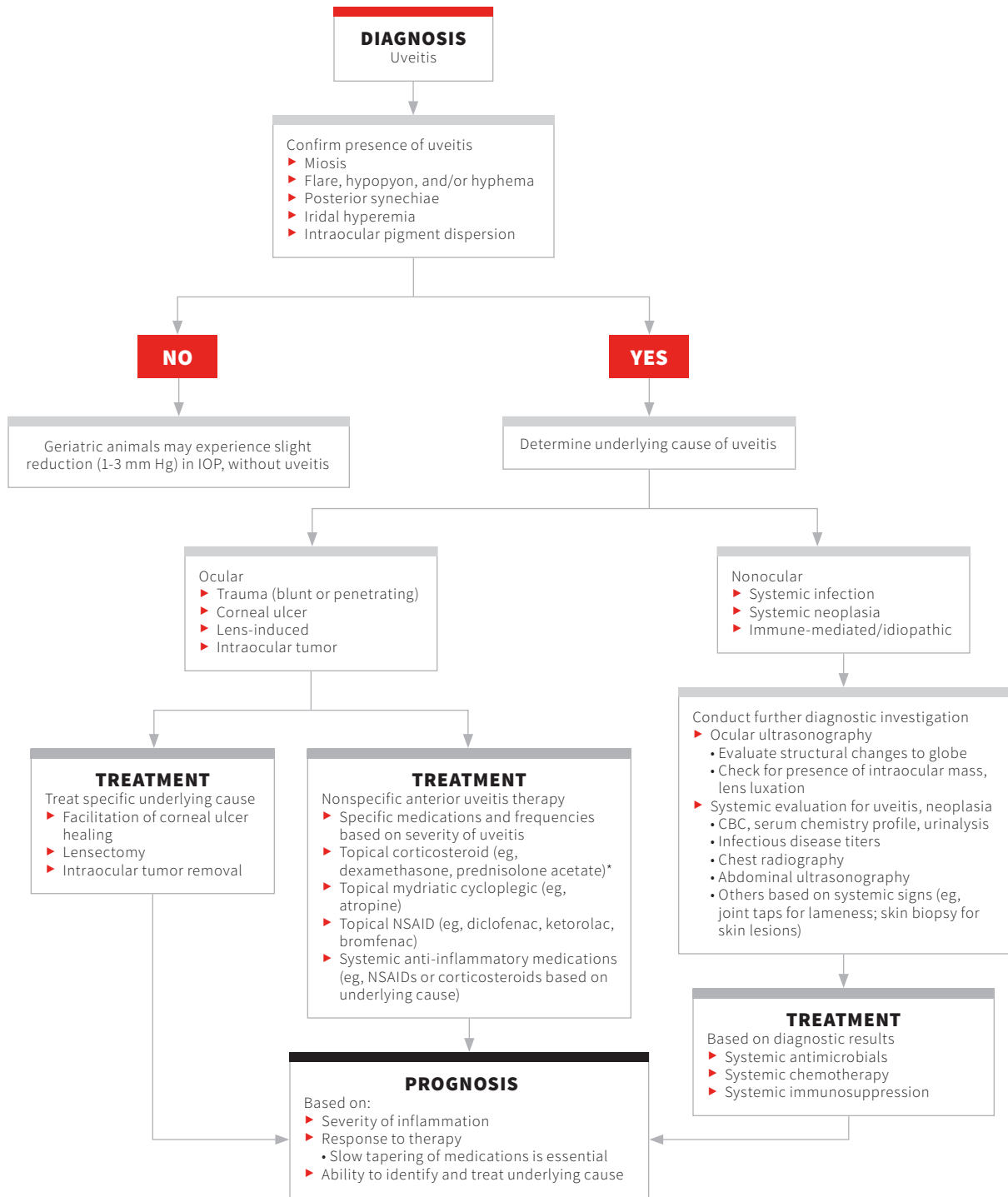
**NOT DECREASED**

**DIAGNOSIS**  
Uveitis  
*Continues on page 60*

Cause of observed ophthalmic changes is other ocular (or CNS) condition, not glaucoma or uveitis

- Determine whether glaucoma is acute or chronic based on clinical signs
- ▶ Acute: pain, diffuse corneal edema, episcleral injection, blindness (negative menace response, negative dazzle, negative PLRs)
  - ▶ Chronic: buphthalmos, Haab's striae (Descemet's membrane tears), cataract, lens subluxation, optic nerve atrophy, retinal vascular attenuation, tapetal hyperreflectivity, blindness (negative menace response, negative dazzle, negative PLRs), any clinical signs noted for acute patients, although signs of pain may not be present





### TREATMENT OF PRIMARY GLAUCOMA

- ▶ IOP-lowering medication
  - Specific medications and frequencies vary with acute vs chronic and primary vs secondary glaucoma
  - Carbonic anhydrase inhibitors (eg, dorzolamide, brinzolamide)
  - Prostaglandin analogues (eg, latanoprost, travoprost)
  - $\beta$  blockers (eg, timolol)
  - Parasympathomimetic medications (eg, demecarium bromide, pilocarpine)
- ▶ Glaucoma-specific surgical intervention
  - Laser cycloablation (referral procedure)
  - Gonioimplantation (referral procedure)

### TREATMENT OF SECONDARY GLAUCOMA

- ▶ IOP-lowering medication
  - Specific medications and frequencies vary with acute vs chronic and primary vs secondary glaucoma
  - Carbonic anhydrase inhibitors (eg, dorzolamide, brinzolamide)
  - $\beta$  blockers (eg, timolol)
- ▶ Treatment of underlying cause
  - Topical anti-inflammatory medications
  - Systemic anti-inflammatory medications
  - Other medications, as indicated for cause of uveitis<sup>†</sup>
  - Lensectomy (referral procedure)
  - Intraocular tumor removal (referral procedure)
- ▶ Glaucoma-specific surgical intervention
  - Laser cycloablation (referral procedure)
  - Gonioimplantation (referral procedure)

### PROGNOSIS

Prognosis depends on underlying cause and response to treatment. If signs of pain continue, definitive treatment may require:

- ▶ Enucleation
- ▶ Evisceration
- ▶ Ciliary body chemical ablation (eg, intravitreal gentamicin injection)

IOP = intraocular pressure

\*Provided no corneal ulcer is present

<sup>†</sup>In patients with secondary glaucoma due to posterior synechiae and iris bombe, atropine may be indicated to break open the pupil and restore aqueous humor flow.

## Suggested Reading

Bergstrom BE, Stiles J, Townsend WM. Canine panuveitis: a retrospective evaluation of 55 cases (2000-2015). *Vet Ophthalmol.* 2017;20(5):390-397.

Plummer CE, Regnier A, Gelatt KN. The canine glaucomas. In: Gelatt KN, Gilger BC, Kern TJ, eds. *Veterinary Ophthalmology.*

5th ed. Ames, IA: Wiley-Blackwell; 2013:1050-1145.

Tofflemire KL, Wang C, Jens JK, Ellinwood NM, Whitley RD, Ben-Shlomo G. Evaluation of three hand-held tonometers in normal canine eyes. *Vet J.* 2017;224:7-10.

## FIND MORE

For more on measuring intraocular pressure, visit [cliniciansbrief.com](http://cliniciansbrief.com)

- ▶ Proper Intraocular Pressure Measurement  
[cliniciansbrief.com/article/proper-intraocular-pressure-measurement](http://cliniciansbrief.com/article/proper-intraocular-pressure-measurement)
- ▶ Top 5 Mistakes When Measuring Intraocular Pressure  
[cliniciansbrief.com/article/top-5-mistakes-when-measuring-intraocular-pressure](http://cliniciansbrief.com/article/top-5-mistakes-when-measuring-intraocular-pressure)
- ▶ Determining Intraocular Pressure  
[cliniciansbrief.com/article/determining-intraocular-pressure](http://cliniciansbrief.com/article/determining-intraocular-pressure)