10.6.5. Childhood Glaucoma (V): Medical Management

- surgical management is the mainstay of PCG care
- medications can be used
  - to lower IOP before surgery
    - to reduce corneal edema and improve visualization
  - to provide additional IOP lowering after surgical procedures
  - for forms of childhood glaucoma other than PCG
    - JOAG
    - inflammatory glaucoma
    - aphakic glaucoma
    - other secondary glaucomas
- β-Adrenergic antagonists (blockers)
  - decrease aqueous production
  - first-line therapy for glaucoma in children
  - systemic complications
    - bronchospasm
    - bradycardia
    - hypotension
    - avoid in children with asthma or significant cardiac disease
    - risk of adverse effects can be diminished by
      - occluding the nasolacrimal drainage system for 3 minutes after administration of the medication
      - prescribing timolol 0.25% or levobunolol 0.25%
        - patients with lighter irides respond as well to 0.25% solutions
- Carbonic anhydrase inhibitors
  - reduce aqueous production
    - topical
      - dorzolamide
        - no BAK-free
      - brinzolamide
      - minimal systemic side effects
      - second-line therapy after topical β-adrenergic antagonists
      - some concern in eyes with compromised corneas or after corneal transplantation
        - not absolute contraindications
    - systemic
      - acetazolamide
      - methazolamide
      - slightly more IOP lowering than topical preparations
      - pediatric dosage of acetazolamide
        - 10–20 mg/kg/day
      - systemic side effects
        - anorexia
        - diarrhea
        - weight loss
        - tingling of the perioral areas and finger
        - hypokalemia
        - metabolic acidosis
        - rare life-threatening reactions
          - Stevens-Johnson syndrome
          - aplastic anemia
- Prostaglandin analogues
  - increase uveoscleral outflow
  - lower IOP in JOAG
  - once-daily dosing
  - adverse effects
    - minimal systemic side effects in children
    - can exacerbate uveitis in postoperative glaucoma patients
      - should be avoided with uncontrolled uveitis
    - conjunctival hyperemia
    - hypertrichiasis
    - periocular pigmentation (reversible)
    - darkening of irides (permanent)
      - does not develop in blue-eyed patients
- α-Adrenergic agonists
  - mechanism of action
    - reduce aqueous production
    - increase uveoscleral outflow
  - brimonidine
    - α2-adrenergic agonist
    - crosses the blood–brain barrier and therefore has significant effects on the central nervous system
    - crosses the blood–brain barrier
      - CNS side effects
        - apnea
        - hypotension
        - bradycardia
        - hypotonia
        - hypothermia
        - somnolence
    - contraindicated in children <3 years
    - caution in children 3-10 years
      - use lowest dose
      - use punctal occlusion
  - greater affinity for α1-receptors than brimonidine
  - less selective α2-adrenergic action than brimonidine
  - apraclonidine
    - better tolerated systemically in children
    - risk of follicular conjunctivitis
      - increases with long-term use
    - vasoconstrictor
      - can be used to minimize bleeding during surgery
- Cholinergic agonists
  - increase aqueous outflow through the trabecular meshwork
  - rarely used on a long-term basis
  - induce miosis
    - facilitate angle surgery
- Prognosis and Follow-Up
  - prognosis for pediatric glaucoma has improved
    - IOP can be controlled with angle surgery in 80%
    - good prognosis
      - asymptomatic at birth with onset of symptoms 3 - 12 months of age
    - guarded prognosis
      - symptoms are present at birth
      - disease is diagnosed >12 months of age
  - amblyopia
    - a common cause of visual compromise
    - etiology
      - corneal opacification
      - anisometropia
      - unilateral glaucoma
  - corneal scarring
    - may cause astigmatism
  - strabismus
    - etiology
      - glaucoma drainage devices
      - amblyopia
  - ocular morbidities
    - progressive myopia and anisometropia
      - in patients with juvenile glaucoma
      - should be corrected with spectacles
    - buphthalmos
      - in patients with PCG
    - cataract
    - lens subluxation
    - susceptibility to trauma
      - protective eyewear
  - recurrent glaucoma
    - minimize conjunctival scarring in anticipation of future glaucoma surgeries
    - be cognizant of the sites of prior trabeculectomies/glaucoma drainage device implants
    - relapses of glaucoma may occur even years later
  - lifelong follow-up
    - educate parents about the need for lifelong care
    - involve these children in their own care