There are many pitfalls in pediatric ophthalmology
There are many potential problems when children come to the ophthalmology office.
Cooperation May Be Poor During Various Portions of the Examination
Preoperative Issues

• Appropriate examination
  – Motor
  – Sensory
  – Other

• Surgical planning

• Realistic expectations by patient and family
Preoperative Dilated Examination

• May reveal retinal scars following previous surgical procedures
Preoperative Counseling: Plastic eye model is helpful
Surgical Risk Sheet

STRABISMUS SURGERY

Complications could occur at the time of surgery, days, weeks, months, or years later:

1. Infection
2. Accidental penetration of the eye
3. Over- and under-correction
4. Double vision
5. Unusual suture reaction
6. Loss of vision or loss of eye

Complication of anesthesia injections around the eye:

1. Perforation of eye ball
2. Destruction of optic nerve
3. Interference with circulation of retina
4. Possible drooping of eyelid
5. Respiratory depression
6. Hypotension (low blood pressure)
7. Loss of life

Additional Comments:

1. The eyes may drift in, out, up, or down in the months and years to come.
2. The eyes will not be made perfectly straight by the surgery alone but surgery will be performed in an attempt to make the eyes closer to straight.
3. More than one operation may be needed to straighten the eyes.
4. Patching and glasses may be needed in the months and years to come.

Signed __________________________
Avoid Legal Complications
Systemic Problems During Pediatric Eye Surgery

- If recognized early, may prevent more serious complications
Oculocardiac Reflex

• Caused by:
  – Traction on EOM (MR most common)
  – Pressure on globe (retropulsion)
  – Can even occur on rare occasions during eye movements, particularly after R & R
Treatment of Bradycardia

- Warn anesthesiologist before pulling on EOM
- Listen to audible pulse tone on anesthesia cart
- If occurs, immediately stop traction on EOM
- Oculocardiac reflex tends to ‘fatigue’ with time
- Rx: Atropine
  Glycopyrrolate (Robinul™)
Malignant Hyperthermia

• Pharmacogenetic disorder of skeletal muscle calcium regulation
• Characterized by acute uncontrolled skeletal muscle hypermetabolism.
• Usually ‘triggered’ by:
  – Inhalational anesthetics
  – Depolarizing muscle relaxant (succinylcholine)
  – Local anesthetics
    • Amide type, includes: lidocaine and bupivacaine
Who is Susceptible?

• Very rare 1:6,000 to 1:60,000 surgical cases
• Family history is important
  – Sporadic or autosomal dominant with incomplete penetrance
• Disorders associated with MH
  – Strabismus
  – Ptosis
  – Myopathies
  – Other musculoskeletal abnormalities
Laboratory Diagnosis of MH

- Susceptibility testing may be warranted
  - If patient history or family history is suspicious

- Conventional test:
  - Muscle biopsy with in vitro halothane and caffeine contraction testing

- If testing is not available:
  - Treat patient as if MH is possible
  - Use non-triggering anesthetic agents
  - Have MH treatment readily available
Special MH Anesthesia Cart is Available in Some Hospitals
dantrolene (Dantrium™)
Genetic Testing in MH

• Genetic testing may be warranted in families with known mutations

• Genes/loci associated with MH
  – CACNA1S
  – MHS2
  – MHS4
  – MHS6
  – RYR1
  – Others?
Where can we find information on rare genetic disorders?

- Answer: The Internet
- Good sources for clinicians:
  - OMIM
  - GeneReviews.org
OMIM

NCBI is implementing changes to help you find current content in OMIM based on resources at NCBI, and then directing you to omim.org. Please be aware that you will leave NCBI to view OMIM records. Access to full records from NCBI (e.g. web, ftp, eutils) will no longer be supported.

OMIM® - Online Mendelian Inheritance in Man®

Welcome to OMIM®, Online Mendelian Inheritance in Man®. OMIM is a comprehensive, authoritative, and timely compendium of human genes and genetic phenotypes. The full-text, referenced overviews in OMIM contain information on all known mendelian disorders and over 12,000 genes. OMIM focuses on the relationship between phenotype and genotype. It is updated daily, and the entries contain copious links to other genetics resources.

This database was initiated in the early 1960s by Dr. Victor A. McKusick as a catalog of mendelian traits and disorders, entitled Mendelian Inheritance in Man (MIM). Twelve book editions of MIM were published between 1966 and 1998. The online version, OMIM, was created in 1985 by a collaboration between the National Library of Medicine and the William H. Welch Medical Library at Johns Hopkins. It was made generally available on the internet starting in 1987. In 1995, OMIM was developed for the World Wide Web by NCBI, the National Center for Biotechnology Information.
OMIM can be used as a ‘Syndrome Finder’
Minor Problems During Surgery

- Very common
- If recognized, generally easy to fix
- Prevent more serious consequences
Locking bite is in muscle capsule or IM septum, but not in tendon. This can lead to a ‘slipped’ muscle.
Suture placement as a potential cause of slipped muscles

- **GOOD** – Locking suture in tendon/muscle
- **BAD** – Locking suture in muscle capsule only
- **BAD** – Locking suture in intermuscular septum
‘Slipped’ Muscle

- Usually not recognized at time of surgery
- Tendon/muscle “slips” posteriorly within its capsule
- Thin capsule remains attached to sclera
Posterior Attachments to Sclera or Other Structures
Suture cut during tenotomy

This can lead to a ‘lost’ or ‘slipped’ muscle.
‘Split Tendon’ with tendon fibers missed during rectus recession.
Muscle Rotated 180 degrees
Scleral Injury During Strabismus Surgery

- Needle Injury
- Injury During Tenotomy
- Other
Needle Choice is Important

Reverse Cutting Needle
Cutting Needle
Spatula Needle
Sclera Incised by Reverse Cutting Needle
Sclera Cut During Tenotomy
Vitreous Prolapsing Through Wound
Post Cryotherapy & Scleral Closure
Problems During Suture Adjustment

- Exposure
- Pain
- Nausea and vomiting
- Oculocardiac reflex
  - Bradycardia
  - Arrest
  - Stoke
- Blood pressure elevation
  - Intracranial bleed
- Other problems
The End