

PROGRAM

OAS

OPHTHALMIC ANESTHESIA SOCIETY

22nd Annual Scientific Meeting

September 26-28, 2008

The Conrad Chicago Hotel • Chicago, IL

Program Co-Chairs and Activity Co-Directors

Gary D. Cass MD

David D. Markoff MD

Activity Director

Marc Allan Feldman MD MHS



Cleveland Clinic

*Jointly sponsored by
The Cleveland Clinic Foundation Center
for Continuing Education and
the Ophthalmic Anesthesia Society*



Copyright © 2008 The Cleveland Clinic Foundation.
All Rights Reserved.

www.EyeAnesthesia.org

OAS

TABLE OF CONTENTS

MEETING SCHEDULE	1
Friday	1
Saturday	1
Sunday	2
MEETING INFORMATION	3
About This Meeting	3
Target Audience	3
Conference Objectives	3
Accreditation Statement	3
Disclaimer	3
Faculty Disclosures	3
About the OAS	4
Contact Information	4
CO-CHAIRS & FACULTY	5
Co-Chairs	5
Faculty	5
PRESENTATION ABSTRACTS	7
Bayes	11
Bovia	14
Byrum	31
Cok	28
Fanning	23
Feldman	7, 38
Fintel	11
Joshi	16
Menke	33
Minhaj	14
Rubenstein	15
Simonson	30
Smith	29
Wilson	34

continued

WORKSHOP ABSTRACTS	39
Workshop A - Peribulbar Anatomy - Fanning	39
Workshop B - SubTenon's Wet Lab - Gayer, et al.	43
Workshop C - Complications of Anesthesia Administered or Ophthalmic Surgery - Cass	43

OAS

SCIENTIFIC AGENDA

FRIDAY, SEPTEMBER 26, 2008

- 12:45 **WELCOME REMARKS**
Gary D. Cass MD, President
Moderator: Marc Allan Feldman MD MHS
- 1:00 **Preoperative Preparation for Ophthalmologic Surgery**
Marc Allan Feldman MD MHS
Participant Objectives: Describe the medical and psychological needs of ophthalmic surgery patients; describe indications for preoperative tests and evaluations; describe a plan for the preoperative care of patients for eye surgery
- 1:40 Discussion
- 1:45 **Update on the use of Antithrombotic agents in the Acute Coronary Patient**
Dan Fintel MD
Participant Objectives: Review use and withdrawal of anticoagulants: heparin, low molecular weight heparin, bivalirudin, fondaparinux, and warfarin; review use and effects of withdrawal antiplatelet agents: aspirin, clopidogrel, dipyridamole, 2b3a inhibitors; review current recommendations for the safety of operative procedures in patients receiving antithrombotic therapies
- 2:25 Discussion
- 2:30 **Management of Pacemakers and ICDs During Ophthalmic Surgery: A Shocking Review**
Joseph Bayes MD
Participant Objectives: Describe the management of pacemakers and implanted cardiac defibrillators before, during, and after ophthalmic surgery
- 3:10 Discussion
- 3:15 Break
- 3:35 **ACLS/PALS Update**
John Bovia
Participant Objectives: Describe the latest methods of life support in emergency situations
- 4:15 Discussion
- 4:20 **Allergic Reactions**
Mohammed M. Minhaj MD
Participant Objectives: Describe preventive measures and emergency responses to allergic reactions in patients having ophthalmic surgical procedures
- 5:10 Discussion
- 5:15 **Ophthalmic Anesthesia: Question the Answers**
Steven Gayer MD MBA
Participant Objectives: List Solutions to Problems Encountered During Ophthalmic Surgery (A Competitive Game)
- 5:55 Discussion
- 6:00 Adjourn
- 6:00 Reception

SATURDAY, SEPTEMBER 27, 2008

- 7:50 **PRESIDENT'S WELCOME REMARKS**
Gary D. Cass MD
Moderator: Steven Gayer MD MBA
- 8:00 **Update in Anterior Segment Ophthalmic Surgery**
Jonathan Rubenstein MD
Participant Objective: Describe newest techniques in cataract surgery and corneal transplant surgery; describe indications for topical vs. local injection vs. general anesthesia in anterior segment surgery
- 8:40 Discussion
- 8:45 **Anesthesia for Ophthalmologists**
Girish Joshi MB BS MD FFARCSI
Participant Objective: Describe current recommendations regarding accreditation of an ASC with respect to ophthalmic surgery; describe current controversies in peri-operative care of a patient undergoing eye surgery under local/block as well as those receiving general anesthesia
- 9:25 Discussion
- 9:30 Break
- 9:45 **The Anti-Coagulated Patient and Ophthalmic Surgery**
Gary L. Fanning MD
Participant Objective: Review the pharmacology of anticoagulants; describe the management of patients on anticoagulants
- 10:25 Discussion
- 10:30 **Pediatric Ophthalmic Surgery and Anesthesia**
Oya Yalcin Cok MD
Participant Objective: Describe anesthesia and surgical needs particular to pediatric patients having ophthalmic surgery
- 11:10 Discussion
- 11:15 **The Cat's Out of the (Re-breathing) Bag: Ophthalmic Anesthesia in the Veterinary Anesthesiologist's World**
Lesley J. Smith DVM DACVA
Participant Objective: Compare unique aspects of anesthesia in veterinary patients presenting for ophthalmic procedures, especially dogs cats, and horses
- 11:55 Discussion
- 12:00 Lunch Break
- (continued on following page)

SATURDAY, SEPTEMBER 27, 2008 *(cont.)*

Moderator: Gary D. Cass MD

- 1:30 **Conducting a Study of Post-Anesthetic Complications in an ASC**
Dan Simonson CRNA MHA
Participant Objective: Describe the process of obtaining Institutional Review Board approval for research conducted in a privately owned ASC; describe methods for conducting prospective studies of post-anesthetic complications in an ASC
- 2:10 Discussion
- 2:15 **Workshop Announcements**
- 2:30 **Workshops**
(Participants may attend 2 of 3 workshops)
- A. Peribulbar Anatomy**
Gary L. Fanning MD
Participant Objective: A thorough review of anatomy of the human orbit, with attention to the details required of the anesthesia provider; safe areas of the orbit, the dangerous areas of the orbit, and approaches to provide safe and effective orbital regional anesthesia for surgery of the eye
- B. SubTenon's Wet Lab**
Steven Gayer MD MBA et al.
Participant Objective: Demonstrate techniques for administering anesthetic solutions utilizing pig eyes and hands-on practice
- C. Complications of Anesthesia Administered for Ophthalmic Surgery**
Gary D. Cass MD
Participant Objective: List possible complications of anesthetics administered for ophthalmic surgery
- 3:30 Break
- 3:40 **Workshops (Second Session - All Repeat)**
- A. Repeat**
- B. Repeat**
- C. Repeat**
- 5:00 Adjourn

SUNDAY, SEPTEMBER 28, 2008

- 7:30 **Annual Meeting of the Membership (non-CME)**
Moderator: David D. Markoff MD
- 8:00 **Error Prevention: Wrong Site Surgery**
Spencer L. Byrum BSM
Participant Objective: Outline the scope and nature of medical errors; describe risk management techniques in other high risk/error intolerant systems; describe tools and best practices for reducing error potential
- 8:40 Discussion
- 8:45 **Risk Management: Ophthalmic Anesthesia Liability**
Anne M. Menke RN PhD
Participant Objective: Evaluate types of anesthesia; determine the most appropriate anesthesia provider; obtain informed consent for anesthesia; respond to complications from anesthesia
- 9:25 Discussion
- 9:30 **Administrative Issues for Today's Surgery Center**
Katherine S. Wilson RN MHA
Participant Objective: Identify administrative challenges in the ASC environment; identify regulatory agencies governing ASCs; describe the accreditation process; outline components of a Quality Program; describe attributes of a successful ASC manager
- 10:10 Discussion
- 10:15 **Case Discussions**
Marc Allan Feldman MD MHS
Participant Objective: Summarize complications, therapies, and results from problem cases submitted by the membership and audience
- 11:15 Discussion
- 12:00 Adjourn

MEETING INFORMATION

ABOUT THIS MEETING

The purpose of the annual meeting of the Ophthalmic Anesthesia Society is to educate its members, as well as other interested healthcare professionals, and share information that will enable them to provide the highest level of anesthesia services during ophthalmic surgery.

THIS MEETING IS OF INTEREST TO:

- Anesthesiologists
- Ophthalmologists
- CRNAs
- RNs
- Ophthalmic Medical Professionals

CONFERENCE OBJECTIVES

Upon completion of this activity, participants will be able to:

- Identify the latest anesthesia techniques for ophthalmic surgery
- Review pertinent historical and anatomical information
- Evaluate different anesthesia techniques to determine which, if any, might warrant a change in current practice
- Generate an increased or a sustained interest in developing knowledge, acquiring skills, and continuing education in this area

ACCREDITATION

Nurse Anesthetist

Approved by the American Association of Nurse Anesthetists for 16 CE Credits: Code Number 30772, expiration date September 28, 2008.

Physician

Accreditation Statement

This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of The Cleveland Clinic Foundation Center for Continuing Education and the Ophthalmic Anesthesia Society. The Cleveland Clinic Foundation Center for Continuing Education is accredited by the ACCME to provide continuing medical education for physicians.

The Cleveland Clinic Foundation Center for Continuing Education designates this educational activity for a maximum of 16.25 *AMA PRA Category 1 Credit(s)*[™]. Physicians should only claim credit commensurate with the extent of their participation in the activity.

This activity may be submitted for American Osteopathic Association Continuing Medical Education credit in Category 2.

DISCLAIMER

The information in this educational activity is provided for general medical education purposes only and is not meant to substitute for the independent medical judgment of a physician relative to diagnostic and treatment options of a specific patient's medical condition. The viewpoints expressed in this CME activity are those of the authors/faculty. They do not represent an endorsement by the Cleveland Clinic. In no event will the Cleveland Clinic be liable for any decision made or action taken in reliance upon the information provided through this CME activity.

FACULTY DISCLOSURES

In accordance with the Standards for Commercial Support issued by the Accreditation Council for Continuing Medical Education (ACCME), The Cleveland Clinic Foundation Center for Continuing Education requires resolution of all faculty conflicts of interest to ensure CME activities are free of commercial bias.

The following faculty have indicated that they may have a relationship, which in the context of their presentation(s), could be perceived as a potential conflict of interest:

Dan J. Fintel MD

Consulting, Teaching and Speaking for Astra Zeneca, Bristol Myers Squibb, GlaxoSmithKline, Merck, Pfizer, Schering Plough, Sanofi Aventis

continued

MEETING INFORMATION

FACULTY DISCLOSURES *(continued)*

Girish P. Joshi MB BS, MD FFARCSI
Consulting, Teaching and Speaking, membership on
Advisory Committee for Adolor, Baxter,
GlaxoSmithKline, MGI Pharma, Oganon, Pfizer

Anne M. Menke RN PhD
Employed by Ophthalmic Mutual Insurance Company

Jonathan B. Rubenstein MD
Consulting, Teaching and Speaking, membership on
Advisory Committee for Alcon

The following faculty have indicated they have no relationship which, in the context of their presentation(s), could be perceived as a potential conflict of interest::

Joseph Bayes MD
John Bovia
Spencer L. Byrum BSM
Gary D. Cass MD
Oya Yalcin Cok MD
Gary L. Fanning MD
Marc Allan Feldman MD MHS
Steven Gayer MD MBA
David D. Markoff MD
Mohammed M. Minhaj MD
Daniel C. Simonson CRNA MHPA
Lesley J. Smith DVM DACVA
Katherine S. Wilson RN MHA AVP

ABOUT THE OAS

The Ophthalmic Anesthesia Society is an organization of anesthesiologists, ophthalmologists, CRNAs and nurses who are committed to sharing education and information that will enable them to provide the highest level of anesthesia services during ophthalmic surgery.

CONTACT INFORMATION

OAS
793-A East Foothill Blvd., #119
San Luis Obispo, CA 93405
805 534 0300 (phone)
805 534 9030 (fax)
Info@EyeAnesthesia.org (email)
www.EyeAnesthesia.org

CO-CHAIRS & FACULTY

Meeting Co-Chairs



Gary D. Cass MD
Tampa Eye and Specialty Surgery
Center
Tampa FL



David D. Markoff MD
Mountain Eye Associates
Clyde NC

Faculty



Joseph Bayes MD
Clinical Director of Anesthesia
Massachusetts Eye & Ear Infirmary
Boston MA



John Bovia
Life Support Services, Inc.
Ann Arbor MI



Spencer L. Byrum BSM
Managing Partner
Convergent HRS, LLC
Weston FL

Activity Director



Marc Allan Feldman MD MHS
Head, Section of Anesthesia and
Director,
Cole Eye Institute Operating Rooms
The Cleveland Clinic Foundation
Cole Eye Institute
Cleveland OH



Oya Yalcin Cok MD
Dept of Anesthesiology and
Reanimation
Adana Teaching and Research Center
Baskent University
Adana Turkey



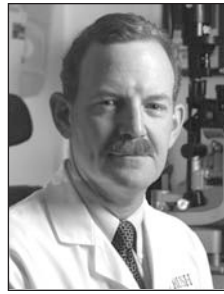
Gary L. Fanning MD
Former Director of Anesthesiology
and Medical Director
Hauser-Ross Eye Institute
Sycamore IL

(continued)

FACULTY



Dan J. Fintel MD
Professor of Medicine,
Director Cardiac Care Unit
Northwestern University
Feinberg School of Medicine
Chicago IL



Jonathan B. Rubenstein MD
Vice Chairman & Deutsch Family
Professor of Ophthalmology
Rush University Medical Center
Department of Ophthalmology
Chicago IL



Steven Gayer MD MBA
Associate Professor of
Anesthesiology & Ophthalmology
Bascom Palmer Eye Institute
University of Miami
Miller School of Medicine
Miami FL



**Daniel C. Simonson CRNA
MHPA**
Spokane Eye Surgery Center
Spokane WA



**Girish P. Joshi MB BS
MD FFARCSI**
Professor of Anesthesiology and
Pain Management,
Director of Perioperative Medicine
and Ambulatory Anesthesia
University of Texas Southwestern
Medical Center
Dallas TX



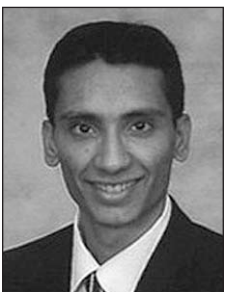
Lesley J. Smith DVM DACVA
Clinical Associate Professor of
Anesthesiology
University of Wisconsin School of
Veterinary Medicine
Department of Surgical Sciences
Madison WI



Anne M. Menke RN PhD
Risk Manager Ophthalmic Mutual
Insurance Company
San Francisco CA



Katherine S. Wilson RN MHA
AVP, HCA Clinical Services Group
HCA Healthcare
Nashville TN



Mohammed M. Minhaj MD
Assistant Professor
University of Chicago
Anesthesia & Critical Care
Chicago IL

FACULTY ABSTRACTS

Preoperative Preparation for Ophthalmologic Surgery

Marc A. Feldman MD MHS

Clinical Director, Section of Anesthesia
Cole Eye Institute
The Cleveland Clinic Foundation

OBJECTIVES:

At the conclusion of this presentation, the participant will:

1. Understand the medical and psychological needs of ophthalmic surgery patients.
2. Know the indications for preoperative tests and evaluations.
3. Be able to plan the preoperative care of patients for eye surgery.

Good care begins with a good preoperative evaluation. Goals of preoperative evaluation include:

- to begin a doctor-patient relationship,
- to prepare the patient psychologically,
- to obtain consent,
- to assess perioperative risk
- to plan anesthetic management.

Eye surgery is the most common surgery in the elderly. In 1999, the Medicare program paid for nearly 2 million claims for cataract surgery.¹

These are quick outpatient procedures. They do not involve blood loss or much postoperative pain. But they are not minor procedures. Ophthalmic surgery can be a major life event.

Establishing a professional relationship reduces anxiety and helps the patient prepare for surgery. Giving information to the patient is just as important as getting information from the patient. An informed patient will be more calm, comfortable, and cooperative.² The patient needs to know what to expect.

Informed consent is required. The anesthetist should discuss the planned anesthetic procedure, the risks, and any alternatives. This need not take more than a few minutes. But it should not be rushed. The discussion of risk should be guided by the medical history and physiologic status.

Preoperative evaluation has additional benefits. General medical screening can be good preventive medicine. This can lead to earlier treat-

ment for new found conditions. Overall medical care can be improved for known conditions which have not yet been optimized.³ The preoperative assessment is an opportunity not only to modify operative risk, but also to address long-term health issues.⁴ Some patients will be found sufficiently ill in the pre-op clinic to need emergent admission to the hospital.

Preoperative evaluation can have potential problems as well. Rapport between physicians can be strained as differences of opinion on management arise. There can be inconsistencies in care. This can lead to inefficiencies, confusion, and frustration to the patient and the medical care team. Last-minute cancellation of surgery for preoperative issues leads to disruption of the operating room schedule.

Two important factors influencing outcome are the degree of illness of the patient and the degree of stress of the surgery. Patients with severe medical problems have higher risk and require more intensive evaluation before surgery. Patients having more invasive procedures also need more intensive studies. Preoperative evaluation of the ophthalmic patient is controversial because it usually involves the preparation of a high-risk patient for low risk surgery.

Eye surgery patients are high-risk as a group. Adults tend to be old. Most have other risk factors such as diabetes, hypertension, and atherosclerosis. Cataract has been shown to be a marker for increased mortality in the Nurses Health Study.⁵

Ophthalmic surgery, however, is low-risk. Mortality after eye procedures^{6,7} is much lower than for the general surgical population.^{8,9} Backer et al.¹⁰ found that eye surgery did not pose the risk of myocardial reinfarction seen with general surgical procedures.¹¹ Patient's chronic diseases have less effect on outcome with these procedures. In a study of unanticipated hospital admissions after outpatient ophthalmic surgery, age and ASA class were not significant factors.¹²

There is controversy regarding the best preoperative management. Some say that because cataract extraction is a low-stress, no-blood-loss procedure, no pre-op evaluation is needed.

Publication of a large, multicenter trial showed no effect of preoperative blood tests and electrocardiogram on post-operative outcome.¹³ Another opinion is that every patient must receive a full evaluation to include every possible test, to detect every possible finding, to institute every possible therapy, and to delay as long as possible, so that the patient can be in the best possible condition and have the lowest possible risk. Appropriate preoperative medical consultation is important. A study of malpractice litigation in cataract surgery found that medical consultation accounted for 16% of the liability. This compared to 17% attributed to either local or general anesthesia.¹⁴

We do not want to ignore risk. Neither do we want to reduce every risk to the lowest conceivable minimum. Our goal is to prepare the patient to present an acceptable risk at surgery. Acceptable risk is determined by the medical care team with the informed consent of the patient. If a patient's condition would indicate inpatient admission for medical treatment, or if a reversible condition would likely lead to a perioperative complication, then the risk is not acceptable.

The goal is to develop guidelines that would encourage consistency of care and minimize disruption to patients and the operating room. The following guidelines are presented after review of literature and published guidelines.

Patient History

Previous hospitalizations and surgical procedures are reviewed. Allergies and drug sensitivities are noted. Latex allergy should be addressed specifically. A current list of medications is obtained. Patient factors that could influence anesthetic management include dementia, deafness, language difficulty, restless leg syndrome, obstructive sleep apnea, tremors, dizziness, and claustrophobia. A pre-operative patient questionnaire can be very helpful.¹⁵ A thorough review of the patient history will help perioperative planning and establishing a doctor-patient relationship.

Physical Examination

Check for signs of major cardiac or pulmonary decompensation. Particular attention should be paid to positioning issues such as severe scoliosis or orthopnea.

Laboratory Studies

No routine screening tests have been shown to improve outcome. Laboratory studies should be determined on the basis of the results of the history and physical exam.¹⁶ As a general rule, the tests that a patient needs prior to ophthalmic procedures are the same as that which the patient would require at a routine exam if surgery were not planned. Tests are chosen when the results are likely to change management. Urgent medical management is obtained for results reaching critical limits.¹⁷

Electrocardiogram: New chest pain, decreased exercise tolerance, palpitations, near-syncope, fatigue, or dyspnea. Tachycardia, bradycardia, or irregular pulse on exam. Critical results: Signs of acute ischemia or injury, malignant arrhythmia, complete heart block, atrial fibrillation which is new, or with heart rate greater than 100 beats per minute.

Serum electrolytes: History of severe vomiting or diarrhea, poor oral intake, changes in diuretic management, arrhythmia. Critical results: Sodium less than 120 mmol/L or greater than 158 mmol/L. Potassium less than 2.8 mmol/L or greater than 6.2 mmol/L.

Urea Nitrogen: signs or symptoms of renal decompensation. Critical result: greater than 104 mg/dL.

Serum Glucose: Polydipsia, polyuria, weight loss. Critical results: less than 46 mg/dL or greater than 484 mg/dL.

Hematocrit / Hemoglobin: history of bleeding, poor oral intake, fatigue, decreased exercise tolerance, tachycardia. Critical results: Hematocrit less than 18% or greater than 61%. Hemoglobin less than 6.6 mg/dL or greater than 19.9 mg/dL

Ophthalmic Evaluation

Visual acuity of both eyes should be noted. Patients with poor vision in the non-operative eye face much greater potential functional loss. These patients have a higher anxiety level. If the patient is to be patched overnight, the physician should anticipate the increased need for post-operative assistance for a temporarily blind patient.

The axial length of the globe should be assessed. When ultrasound measurements are available, the axial length should be noted. If no ultrasound is available, a myopic patient should be assumed to have an increased axial

length. If a posterior staphyloma is present, the risks of injection anesthesia may be dramatically increased.¹⁸ Preoperative glaucoma history, increased intraocular pressure, and increased axial length are important risk factors for suprachoroidal hemorrhage.¹⁹ The risk may be reduced with tighter control of intraoperative heart rate and blood pressure.²⁰ Preoperative softening with a compression device may also decrease risk.

Cardiovascular Evaluation

The American Heart Association and American College of Cardiology published guidelines for perioperative cardiovascular evaluation for noncardiac surgery.²¹ Ophthalmic procedures such as cataract extraction are specifically identified as low-risk procedures. For these procedures, evaluation is focused on patients with major clinical predictors of risk. These major predictors generally mandate intensive management that often results in delay or cancellation of surgery until the cardiac problem is clarified and appropriately treated.

1. Recent myocardial infarction with evidence of important ischemic risk. The American College of Cardiology defines recent MI as less than or equal to 30 days. This is a much shorter period than the three to six months that have often been used as a guideline. Indications for coronary angioplasty or coronary revascularization procedures are the same as if the patient were not having an ophthalmic procedure.

2. Unstable or severe angina. This includes Canadian Class III or IV.²² Class III is defined as marked limitations of ordinary physical activity. Angina occurs on walking one to two blocks on the level or climbing one flight of stairs. Class IV is defined as the inability to carry on any physical activity without discomfort -- angina symptoms may be present at rest.

3. Decompensated congestive heart failure. These patients normally cannot lie flat for a procedure.

4. Significant arrhythmia. These include high-grade atrioventricular block such as complete heart block, symptomatic ventricular arrhythmia, and supraventricular arrhythmias with uncontrolled ventricular rate. A careful evaluation for drug toxicity or metabolic derangement

should be done. Indications for cardiac pacing and anti-arrhythmic therapy are the same as in the non-operative setting.

5. Severe valvular disease. Symptomatic stenotic lesions are associated with severe congestive heart failure and shock. These may require percutaneous valvotomy or valve replacement. Symptomatic regurgitant lesions can usually be stabilized with medical therapy. Because ophthalmic procedures are not associated with significant bacteremia, antibiotic prophylaxis is not recommended.²³

Hypertension

Hypertension is a common problem in ophthalmic patients. Severe hypertension may lead to perioperative complications. Degrees of hypertension have been defined.²⁴ Stage 3 of severe hypertension is defined as a systolic of 180 mm Hg or more, or a diastolic of 110 mm Hg or more. It would be prudent to reschedule elective procedures in patients with sustained stage 3 hypertension until after two weeks of anti-hypertensive therapy.

Pulmonary

Ophthalmic procedures generally require that the patient lie flat comfortably and quietly. If the patient cannot lie flat, or if there is intractable cough, a perioperative complication is more likely. Preoperative risk reduction strategies include cessation of cigarette smoking, treatment of airflow obstruction with bronchodilators or steroids, and administration of antibiotics for respiratory infections.²⁵

Patients should be assessed for sleep apnea. Intravenous sedation is often contraindicated in these patients. For some patients, treatment with a mild stimulant such as caffeine can be helpful in keeping them awake and cooperative during a procedure.

Endocrine

Diabetes mellitus is very common in the ophthalmic surgical population. It is best if these patients can be done early in the morning with as little disturbance as possible to their usual daily routine. Severe hyperglycemia and hypoglycemia are to be avoided.²⁶ A fasting blood glucose should be checked preoperatively. Insulin therapy should be used, if needed, to keep the blood glucose in the range of 150 - 250 mg/dL. The potential for autonomic neuropathy needs to be considered,²⁷ especially when elevating the patient from the supine position.

Patients on long-term steroid therapy generally do not require "stress-dose" steroid treatment for ophthalmic surgery.²⁸ The patient should be given their normal dose of steroid on the day of surgery. The physician should be alert to the occasional patient who may require additional glucocorticoid perioperatively. Unexpected hypotension, fatigue, and nausea may be signs of a patient who needs additional steroid.

Anti-coagulation

Many patients for ophthalmic surgery present taking anti-coagulant medications. Perioperative management of anti-coagulant medications involves weighing the relative risks of thrombotic vs. hemorrhagic complications.²⁹ Either of these results can be devastating to the patient.

The risk of thrombotic complications depend on:

1. The indication for anticoagulation. Serious complications from arterial thromboembolic disease such as atrial fibrillation or valvular heart disease, are much more common than complications from venous disease, such as deep venous thrombosis.

2. The risk factors for thromboembolism in the individual, especially if and when the patient had a previous episode of thromboembolism

The risk of hemorrhagic complications depend on

1. The degree of anti-coagulation

2. The hemorrhagic potential of the surgical procedure. Serious hemorrhagic complications are most probable in orbital and oculoplastic surgery, intermediate in vitreoretinal, glaucoma, and corneal transplant and least likely in cataract surgery.

A consensus is developing that cataract surgery may be safely performed while maintaining patients on warfarin.³⁰ For intermediate risk procedures, like some glaucoma surgeries, stopping warfarin for four days preoperatively is indicated. For high risk cases for hemorrhage or thrombosis, conversion of warfarin to heparinization, may be required.

¹ Bierstein, K. How much is Medicare spending on anesthesia services? *ASA Newsletter* 2001; 65(7): 28-31.

² Donlon JV Jr. Local anesthesia for ophthalmic surgery: patient preparation and management. *Ann Ophthalmol.* 1980 Oct;12(10):1183-91.

³ King MS. Preoperative evaluation. *Am Fam Physician.* 2000 Jul 15;62(2):387-96.

⁴ Palda V. PRE-OPportunity knocks: a different way to think about the preoperative evaluation. *Am Fam Physician.* 2000 Jul 15;62(2):308-311.

⁵ Hu FB, Hankinson SE, Stampfer MJ, Manson JE, Colditz GA, Speizer FE, Hennekens CH, Willett WC. Prospective study of cataract extraction and risk of coronary heart disease in women. *Am J Epidemiol* 2001;153(9):875-881.

⁶ Petruscak J, Smith RB, Breslin P. Mortality related to ophthalmological surgery. *Arch Ophthalmol.* 1973 Feb;89(2):106-109.

⁷ Quigley HA. Mortality associated with ophthalmic surgery. A 20-year experience at the Wilmer Institute. *Am J Ophthalmol.* 1974 Apr;77(4):517-524.

⁸ Hovi-Viander M. Death associated with anaesthesia in Finland. *Br J Anaesth.* 1980 May;52(5):483-489.

⁹ Vacanti CJ, VanHouten RJ, Hill RC. A statistical analysis of the relationship of physical status to postoperative mortality in 68,388 cases. *Anesth Analg.* 1970 Jul-Aug;49(4):564-566.

¹⁰ Backer CL, Tinker JH, Robertson DM, Vlietstra RE. Myocardial reinfarction following local anesthesia for ophthalmic surgery. *Anesth Analg.* 1980 Apr;59(4):257-262.

¹¹ Rao TL, Jacobs KH, El-Etr AA. Reinfarction following anesthesia in patients with myocardial infarction. *Anesthesiology.* 1983 Dec;59(6):499-505.

¹² Freeman LN, Schachat AP, Manolio TA, Enger C. Multivariate analysis of factors associated with unplanned admission in 'outpatient' ophthalmic surgery. *Ophthalmic Surg.* 1988 Oct;19(10):719-723.

¹³ Schein OD, Katz J, Bass EB, Tielsch JM, Lubomski LH, Feldman MA, Petty BG, Steinberg EP. The value of routine preoperative medical testing before cataract surgery. Study of Medical Testing for Cataract Surgery. *N Engl J Med.* 2000 Jan 20;342(3):168-175.

¹⁴ Kraushar MF, Turner MF. Medical malpractice litigation in cataract surgery. *Arch Ophthalmol.* 1987 Oct;105(10):1339-1343.

¹⁵ Lutner RE, Roizen MF, Stocking CB, Thisted RA, Kim S, Duke PC, Pompei P, Cassel CK. The automated interview versus the personal interview. Do patient responses to preoperative health questions differ? *Anesthesiology.* 1991 Sep;75(3):394-400.

¹⁶ Roizen MF. More preoperative assessment by physicians and less by laboratory tests. *N Engl J Med.* 2000 Jan 20;342(3):204-205.

¹⁷ Kost GJ. Critical limits for urgent clinician notification at US medical centers. *JAMA.* 1990 Feb 2;263(5):704-707.

¹⁸ Duker JS, Belmont JB, Benson WE, Brooks HL Jr, Brown GC, Federman JL, Fischer DH, Tasman WS. Inadvertent globe perforation during retrobulbar and peribulbar anesthesia. Patient characteristics, surgical management, and visual outcome. *Ophthalmology*. 1991 Apr;98(4):519-526.

¹⁹ Speaker MG, Guerriero PN, Met JA, Coad CT, Berger A, Marmor M. A case-control study of risk factors for intraoperative suprachoroidal expulsive hemorrhage. *Ophthalmology*. 1991 Feb;98(2):202-209.

²⁰ Tabandeh H, Sullivan PM, Smahliuk P, Flynn HW Jr, Schiffman J. Suprachoroidal hemorrhage during pars plana vitrectomy. Risk factors and outcomes. *Ophthalmology*. 1999 Feb;106(2):236-42.

²¹ Eagle KA, Brundage BH, Chaitman BR, Ewy GA, Fleisher LA, Hertzner NR, Leppo JA, Ryan T, Schlant RC, Spencer WH 3rd, Spittell JA Jr, Twiss RD, Ritchie JL, Cheitlin MD, Gardner TJ, Garson A Jr, Lewis RP, Gibbons RJ, O'Rourke RA, Ryan TJ. Guidelines for perioperative cardiovascular evaluation for noncardiac surgery. Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Committee on Perioperative Cardiovascular Evaluation for Noncardiac Surgery. *Circulation*. 1996 Mar 15;93(6):1278-1317.

²² Campeau L. Letter: Grading of angina pectoris. *Circulation*. 1976 Sep;54(3):522-523.

²³ Dajani AS, Taubert KA, Wilson W, Bolger AF, Bayer A, Ferrieri P, Gewitz MH, Shulman ST, Nouri S, Newburger JW, Hutto C, Pallasch TJ, Gage TW, Levison ME, Peter G, Zuccaro G Jr. Prevention of bacterial endocarditis. Recommendations by the American Heart Association. *Circulation*. 1997 Jul 1;96(1):358-366.

²⁴ The sixth report of the Joint National Committee on prevention, detection, evaluation, and treatment of high blood pressure. *Arch Intern Med*. 1997 Nov 24;157(21):2413-2446.

²⁵ Smetana GW. Preoperative pulmonary evaluation. *N Engl J Med*. 1999 Mar 25;340(12):937-44.

²⁶ Schade DS. Surgery and diabetes. *Med Clin North Am*. 1988 Nov;72(6):1531-1543.

²⁷ Burgos LG, Ebert TJ, Asiddao C, Turner LA, Pattison CZ, Wang-Cheng R, Kampine JP. Increased intraoperative cardiovascular morbidity in diabetics with autonomic neuropathy. *Anesthesiology*. 1989 Apr;70(4):591-597.

²⁸ Salem M, Tainsh RE Jr, Bromberg J, Loriaux DL, Chernow B. Perioperative glucocorticoid coverage. A reassessment 42 years after emergence of a problem. *Ann Surg*. 1994 Apr;219(4):416-425.

²⁹ Kearon C. Perioperative management of long-term anticoagulation. *Semin Thromb Hemost*. 1998;24 Suppl 1:77-83.

³⁰ Langston RH. What is the risk of complications from cataract surgery in patients taking anticoagulants?

Update on the use of Antithrombotic agents in the Acute Coronary Patient

Dan Fintel MD

Professor of Medicine,
Director Cardiac Care Unit
Northwestern University
Feinberg School of Medicine
Chicago IL

Objectives

1. Understand the pathophysiology of acute coronary syndromes: plaque rupture, the role of the platelet (adherence, activation and aggregation), and activation of the extrinsic pathway of coagulation, resulting in thrombosis
2. Review antithrombotic therapies: unfractionated heparin, low molecular weight heparins, direct acting antithrombins, pentasaccharides, warfarin, and experimental antithrombins
3. Review antiplatelet therapies: aspirin, IIb/IIIa inhibitors, and clopidogrel
4. Review the interaction of these agents
5. Review the optimal approaches to discontinue antithrombotic therapy prior to surgery and restart it afterwards

Management of Pacemakers and ICDs During Ophthalmic Surgery: A Shocking Review

Joseph Bayes MD

Clinical Director of Anesthesia
Massachusetts Eye & Ear Infirmary
Boston MA

Note: Please see additional submission (form) on pg. 44

There is good and bad news for ophthalmic anesthesiologists regarding the management of pacemakers and ICDs. The good news is that modern pacemakers and ICDs improve the quality and length of life when used for appropriate indications (1), are generally reliable although malfunctions do occasionally occur (2,3), and that during ophthalmic surgery these devices are unlikely to discharge or malfunction. (Assuming the patient and the device have been appropriately evaluated, and necessary management information has been obtained preoperatively.) (4)

The bad news is that these devices are complex, and hospitals have some equipment (5)

and possibly drugs that **can** interfere with the proper functioning of these devices. In addition, to appropriately care for patients with these devices, additional preoperative information about the device is required. (6,7)

It is estimated that about 3,000,000 patients (worldwide) currently have a pacemaker and 300,000 have an ICD (8). Probably about half of these patients reside in the U.S.

The optimum perioperative management of these devices occurs in three steps:

1. Preoperatively: Patients with these devices should be identified before the day of surgery by the surgeon and/or the preoperative assessment staff. A summary of the most recent hospital or doctor's office interrogation of the device (not just telephone interrogation which primarily checks battery life) should be obtained and reviewed. (At MEEI we require pacemakers to have this interrogation with 6 months and ICDs within 3 months of elective surgery.)

This information should ideally include the type of device (e.g. Pacemaker? ICD?) Date and indication for implantation of the device, the manufacturer and model #, adequacy of battery life, confirmation of appropriate programming and function, how the device will respond to a magnet, number and dates of past ICD discharges (if any), any special precautions or recommendations, name and contact information of person filling out the form, and name and contact person in case of a problem with the device on the day of surgery. (See attached MEEI Data Request form.)

Of note: Most (but not all) pacemakers will convert to a fixed rate mode if a magnet is placed over the generator.

All ICDs manufactured by Medtronic, Biotronik, and ELA, and most ICDs manufactured by Boston Scientific/Guidant and St. Jude, will temporarily be inactivated while a magnet is placed over the generator. However, *it is very important to note that a small percentage of Boston Scientific/Guidant ICDs can be programmed to be "permanently" inactivated by a magnet unless reactivated in a specific sequence (9), and a small percentage of Boston Scientific/Guidant and St. Jude ICDs can be pro-*

grammed not to respond to a magnet.

Therefore except in an emergency situation, a magnet should **NOT** be placed over a pacemaker or ICD unless it is known how the device will respond to the magnet and what steps (if any) are needed to return it to appropriate function after the magnet is removed.

After preoperative device specific information is obtained, a decision is made if it is appropriate to proceed in an outpatient or in-patient setting. For patients at low risk of having a device malfunction or ICD discharge, and not requiring complex management procedures, surgery at an outpatient facility is appropriate. For patients at moderate to high risk of having intraoperative ICD discharge or require complex device management procedures, consideration should be given to having surgical procedures performed at a facility with in-house electrophysiology support.

On the day of surgery confirm with the patient they have not had any recent device related cardiac symptoms (e.g. dizziness, syncope, ICD discharge) and if appropriate proceed with planned procedure.

2. Intraoperatively:

Pacemakers:

Most pacemakers can be left in their normal programmed mode for most eye operations. Hand held battery operated electrocautery and bipolar electrosurgical instruments are extremely unlikely to interfere with pacemakers (and ICDs).

For patients who are pacemaker dependent, and having surgery that requires unipolar electrosurgery, consideration should be given to having their pacemakers reprogrammed preoperatively to a fixed rate function and without rate responsive or antitachycardia features.

Patients who are pacemaker dependent and have not have their pacemaker converted to a fixed rate mode, should have their pulse monitored during electrosurgery. The surgeon should be requested to use bursts of a few seconds when using electrosurgical instruments, and to use the lowest power settings possible. If electrosurgery interferes with the functioning

of a pacemaker, the pacemaker can usually be converted to a fixed rate mode by placing a magnet over the generator

If unipolar electrosurgery is required (for patients with pacemakers or ICDs), the dispersive pad should be placed as close to the surgical site and as far from the generator as possible.

ICDs: Two ways to manage ICDs during eye surgery.

Leave them active. In a survey of OAS members 83% left ICDs active when bipolar electrosurgery was used with no reports of ICD malfunction, or ICD discharge (10). Advantages: Easiest way to manage device, least likely to cause (rare) problems with devices attempting to inactivate them. Disadvantages: Rare risk of patient movement if device discharges. If VT or VF occurs expect to have only 6-12 seconds before device discharge and patient movement (4). Also have the rare risk of ICD discharge inappropriately from SVT or other device malfunction.

Inactivate them. Should inactivate device (after placing on ECG monitoring and having working external defibrillator in room) if unipolar electrosurgery used.

Can inactivate ICD during eye surgery to reduce (rare) risk of device discharge and patient movement *IF* sure you know how to inactivate and reactivate device.

Should also consider inactivation ICD for eye surgery if patient is having frequent device discharges, and possibly if general anesthesia required. (No case reports to date of succinyl choline, peripheral nerve stimulators, or post operative shivering causing an ICD to malfunction but consider the possibility from muscle fasciculations, EMI, or muscle movements.)

Advantage: Patient will not move in the unlikely event of arrhythmia. Disadvantages: Requires manufacturer and sometimes device specific knowledge about how the device is inactivated and reactivated. (Magnet? Interrogation device?) Must have working external cardioverter-defibrillator immediately available.

Remember that a small percentage of Boston Scientific/Guidant ICDs will be "permanently" inactivated by a magnet (unless reactivated in a specific sequence), and a small percentage of Boston Scientific/Guidant and St. Jude ICDs can be programmed not to respond to a magnet.

Postoperatively:

Assess clinically any device malfunction before removing patient from monitors. Not necessary to interrogate device routinely postoperatively before discharge if:

1. No cardiac or ECG abnormalities noted.
2. Unipolar electrosurgery device not used. (May not be necessary to interrogate if unipolar electrosurgery device was greater than 6 inches from generator. Check with patient's EP lab.)
3. Magnet used on Medtronic, St. Jude, Biotronix, or ELA ICDs.
4. Magnet used on Boston Scientific/Guidant ICD *and* you have confirmed with patient's EP lab or company rep that when magnet removed, ICD function will return to normal, or have exactly followed protocol and confirmed by appropriate audible tones, device reactivation.

References

1. Goldenberg I, Moss AJ. Implantable device therapy. (A good summary of clinical trials for ICDs and CRT therapy) Prog Cardiovasc Dis 2008;50(6):449-474
2. Bernstein AD, Parsonnet V. Survey of cardiac pacing and implanted defibrillator practice patterns in the United States in 1997. PACE 2001 24:842-855
3. Maisel WH et al. Pacemaker and ICD generator malfunction. JAMA 2006;295(16) 1901-1906
4. Bayes J, Rozner MA. Management of implanted cardiac defibrillators during eye surgery. Anesth Analg 2008 106(2):671-672
5. El-Gamal HM, Dufresne RG, Saddler K. Electrosurgery, pacemakers and ICDs: A survey of precautions and complications experienced by cutaneous surgeons. Dermatol Surg 27;4:385-388
6. Rozner M. Discussion about current perioperative ICD management for outpatient facilities. www.sambahq.org/enewsletter/enews-Apr-2007-part2.html
7. Stevenson WG et al. Clinical assessment and management of patients with implanted cardioverter-defibrillators presenting to nonelectrophysiologists. Circulation 2004;110:3866-3869
8. Rozner MA. The patient with a cardiac pacemaker or ICD and management during anesthesia. Curr Opin Anaesthesiol 2007;20:261-268
9. Rasmussen MJ et al. Unintentional deactivation of

ICDs in health care settings. *Mayo Clin Proc* 2002;77:855-859

10. Bayes J. A survey of Ophthalmic anesthesiologists on managing pacemakers and ICDs. *Anesth Analg* 2006.103(6):1615-1616

Some other useful references on the subject:

Santini M, Lavallo C, Ricci RP. Primary and secondary prevention of sudden cardiac death: Who should get an ICD? *Heart* 2007;93:1478-1483

Sanders GD, Hlatky MA, Owens DK. Cost-effectiveness of implantable cardioverter-defibrillators. *N Engl J Med* 2005;353:14:1471-1480

Vijaykumar E. Anesthetic considerations in patients with cardiac arrhythmias, pacemakers, and AICDs. *2001 Int Anesthesiol Clin* 2001 39(4) 21-42

ACLS/PALS Update

John Bovia

Life Support Services, Inc.
Ann Arbor MI

Due to the inherent knowledge, skills, practice locations, and populations of patients served by practitioners of anesthesiology and/or emergency and critical care medicine, the physicians, nurses, and other such advanced care providers are summoned to serve the dying patient, particularly those whose death is sudden and unexpected. John Bovia will examine the history of resuscitation from pre-biblical times to the modern age of resuscitation. He will update practitioners with the latest consensus on this body of scientific information in the form of formal guidelines provided by national agencies, recognized to possess the resources to develop guidelines and identify mandatory skills, which are required to provide quality resuscitative care for patients of all ages in all clinical and non-clinical locations. We will thoroughly explore the success and failure rates of these current accepted guidelines.

At the conclusion of the presentation, the participant will be able to explain the latest guidelines for resuscitation, particularly pharmacology, dysrhythmia identification, pertinent equipment and recommended therapeutic intervention, featuring those most recently added or altered for the management of cardiac arrest and the description of how this newer information impacts the performance of resuscitative procedures.

Allergic Reactions

Mohammed M. Minhaj

Assistant Professor
University of Chicago
Anesthesia & Critical Care
Chicago IL

Perioperative anaphylactic and anaphylactoid reactions carry significant potential for morbidity and even mortality. Although rare, the true incidence of anaphylactic reactions in anesthesia is unknown, it is estimated that they occur in approximately 1 in every 5,000 – 20,000 anesthetics. These immunologically mediated reactions (anaphylactic) are a result of IgE binding to mast cells causing a release of the histamine and other mediators contained within them. In contrast, anaphylactoid reactions are chemically mediated not immunologically mediated, and may occur more frequently.

Clinically however, the presentation of the two is similar and centers around the release of histamine and other mediators. Histamine release can result in cutaneous manifestations, bronchospasm, and difficulties in airway management. Additionally, the effects on the central circulation via the cardiovascular system (more common in anaphylactic reactions) can be significant. Histamine release causes tachycardia, coronary artery vasoconstriction, and significant peripheral vasodilation. Mortality is associated with not only compromise of the cardiovascular system, but also because of pulmonary manifestations.

The most common anesthetic agents implicated in anaphylactic reactions are neuromuscular blockers, latex, and antibiotics. While there has been a marked increase in the incidence of reactions attributed to antibiotics, the reporting of latex allergy has remained steady. After a sharp increase in the early 1990's, the aggressive push towards making hospitals and operating room equipment latex free has helped to stabilize the incidence of latex anaphylaxis. With respect to other commonly used anesthetic agents, it is fortunate that true anaphylactic reactions to local anesthetics and opiates remain rare.

Treatment actually begins preoperatively, with goals towards preemptive management. Patients with a history of anaphylactic reactions

should not be re-exposed to the triggering agent in the perioperative period. However, it should be recognized that patients may overstate or misinterpret allergies and anaphylactic reactions, so a clear history with access to previous anesthetic records would prove most useful. Beyond just a history of anaphylaxis, reported allergies to multiple other agents increases a patients' risk for a latex reaction, thought not for other allergy to other anesthetic agents (e.g., muscle relaxants).

Intraoperatively, if a reaction is thought to have occurred, it is important to recognize that prompt diagnosis and treatment are vital. The delivery of oxygen and securing the airway should take precedence followed by circulatory support with fluid and epinephrine. Postoperatively, patients may remain intubated for a time to allow for circulatory and pulmonary support. Given the cross reactivity inherent to the anesthetic agents, patients should be warned extensively prior to another anesthetic. The polypharmacy inherent in many anesthetics makes identifying the correct "culprit" difficult, though through the use of skin tests and dedicated follow-up it may be possible

Because of the rarity of these events, the presentation will review the pathophysiology of the reaction, commonly implicated agents with attention paid to the changing trends in the literature, and finally on correct diagnosis and management if a reaction does occur.

Update in Anterior Segment Ophthalmic Surgery

Jonathan Rubenstein MD

Vice Chairman & Deutsch Family
Professor of Ophthalmology
Rush University Medical Center
Department of Ophthalmology
Chicago IL

I. Cataract Surgery

Cataract Surgery has undergone significant advancements over the past 2 years. As with many types of surgeries, the move has been towards smaller incisions and less invasive techniques. Many cataract surgeons are making incisions that are less than 2.4 mm in length through the avascular temporal clear cornea.


This smaller incision allows for less discomfort, easier wound sealing without sutures and therefore quicker recovery. Many of these procedures can be performed under topical anesthesia. Techniques for topical anesthesia will be discussed. Advancements have also been made in phacoemulsification technology to allow for more efficient removal of the cataractous lens. Cataract removal can proceed more quickly and with less trauma to the intraocular structures. Advancements have also been made in intraocular protection using visco-elastics to coat and protect the cornea and the lens capsule. Finally, advancements have been made in intraocular lens (IOL) technology to provide the ability for less traumatic insertion of IOLs through smaller corneal incisions. Also, IOLs can now provide the ability to correct both far and near vision and correct myopia, hyperopia and astigmatism to allow patients to be less dependent on glasses post-operatively.

II. Corneal surgery

The major advancements in corneal transplant surgery have been to only replace the portion of the cornea that is not functioning properly or is preventing optical clarity. For example, a majority of corneal transplants are for corneal edema secondary to corneal endothelial dysfunction. The newer technique is to remove and replace the dysfunctional corneal endothelium with a technique called Descemet's Stripping Endothelial Keratoplasty (DSEK). This technique involves adding only a very thin strip of posterior corneal stroma and new endothelium to a patient through a small temporal clear corneal incision. The anesthesia requirements are usually a local block or even topical anesthesia for some cases. Diseased or scarred anterior cornea can also be replaced with a technique called Deep Anterior Lamellar Keratoplasty (DALK). This is a technique that only replaces the anterior abnormal cornea saving the patient from a total corneal transplant. Local anesthesia is also used here. Certainly some patients still require a complete Penetrating Keratoplasty (PK) for full thickness corneal diseases. General anesthesia is usually utilized in these cases.

The indications for all these procedures with the appropriate use of anesthesia will be discussed.

THE UNIVERSITY OF TEXAS
SOUTHWESTERN MEDICAL CENTER
AT DALLAS



Anesthesia for Ophthalmologists

Girish P. Joshi, MBBS, MD, FFARCSI
Professor of Anesthesiology and Pain Management
Director of Perioperative Medicine and Ambulatory Anesthesia

Outline

- Discuss efficiency of ASC/Office and myths of accreditation of ASC/Office
- Understand the issues concerning preoperative assessment and preparation for eye surgery
- Review the local/regional anesthesia techniques
- Describe the sedation-analgesia techniques and their influence on outcome
- Examine the role of the anesthesia provider

Emphasis on ASC Efficiency

- Despite increase in ambulatory procedures, ASC profitability is threatened
- Reduced income from increased competition and changes in revenue stream (shifting reimbursement model)
- Rising costs of doing business and rising patient expectations
- Need to improve efficiency to maintain or

Efficiency: Definition

- **Productive working** with a minimum wasted **effort** or **expense**
- Efficiency = \uparrow Productivity and \downarrow Costs
 - Productive work: increased number of procedures performed for a fixed amount of money
 - Minimize costs needed to meet a predetermined production goal

Characteristics of Successful ASC/Office

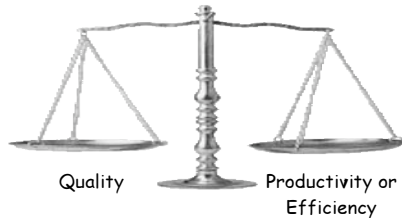
- Minimal variation in clinical practice
 - Reduce potential for errors and improve patient safety
 - Kaissi A: Hlth Cr Man Rev 2004; 29: 129-32
 - Develop evidence-based clinical pathways
- Minimal variation in system processes
 - Improve patient throughput
 - Optimize OR utilization (prevent under- and over-utilization) and minimize cancellations

Characteristics of Successful ASC/Office

- Purchase information and labor-saving technology
- Cross-train employees (e.g., OR and PACU nurses)
- Implement continuous quality improvement process (allows data-driven analytical processes)
- Ongoing process reflecting changes in medical science and technology

Efficiency Vs. Quality of Health Care

- Increased productivity must not decrease quality
- Quality of patient care supercedes ASC efficiency



Accreditation

- Accreditation is increasingly becoming mandatory through legislation, payors, insurers, and consumers
- Accreditation process can be a positive learning experience that improves quality of care
- Costs and efforts of accreditation are compensated by benefits

Accreditation

- Accreditation alone may not ensure patient safety, need continuous compliance even after the survey visit
- Necessary to involve all members in the accreditation process
- Little effect on perception of staff not directly involved in the accreditation

AAHC Institute for Quality Improvement Cataract Surgery Study

- Accreditation provides opportunity to participate in and learn about clinical and non-clinical performance measurement
- Allows comparison with national benchmarks
 - Pre-procedure time : median 72 min (23-124 min)
 - Procedure time: median 14 min (4-32 min)
 - Discharge time (time from end of surgery to discharge home): median 20 min
 - Total time in facility time: median 128 min
 - Complication rate: 1.25%

Preoperative Evaluation and Preparation For Eye Surgery

Preoperative Testing

- Routine screening tests are of no clinical benefit
 - Preop evaluation should not be used to screen asymptomatic patient
- Unnecessary tests may cause unnecessary anxiety, delays and cancellations, and are expensive, potential harm stemming from false-negative or false-positive results
- Tests guided by patient's age, ASA status, co-morbidity (cardiovascular, pulmonary, and renal)

ASA Practice Advisory: Anesthesiology 2002; 96:485-96; <http://www.nice.org.uk/pdf/C63NICEguideline.pdf>

Elimination of Routine Testing in Cataract Surgery Saves Costs

- 1231 consecutive patients undergoing cataract surgery under topical/regional anesthesia
 - 636 had routine tests and 595 had no routine tests
- Both groups had similar gender, co-morbidities (ASA status)
- Policy of no routine testing reduced number of tests from average 5.8 to 0.4 per patient
 - Tests not done routinely - CBC, INR, PTT, electrolytes, creatinine, urea, blood sugar level, ECG
- No difference in perioperative adverse events

Imasogie et al: Can J Anaesth 2003; 50: 246-8

Preoperative Preparation

- Explain the perioperative process and address patient expectations and concerns
 - Avoid sudden movement and warn before moving
 - Patient may see surgeons hands, instruments, light and colors
- Preoperative medications
 - Continue routine medications including anticoagulants
 - Acetaminophen 1 gm, po, 1-2 h preoperatively
 - Diazepam 5-10 mg, po, 1-2 h preoperatively, if no plans to use IV sedation/analgesia

Blocks For Eye Surgery

Practice in the US

- Survey of Ophthalmologists attending the Congress of International Council in 2002
 - Topical anesthesia in 23%
 - Peribulbar block in 23%
 - Retrobulbar block in 46%
 - Other in 8%

Eichel and Goldberg: Clin Experiment Ophthalmol 2005; 33: 469-72

Practice in United Kingdom

- Data from UK National Health Service database, Nov 2001-July 2006
- 55,567 cataract surgical procedures included
- Local/regional blocks used in 95.5% (GA in 4.5%)
 - Topical - 22.3%, topical and intracameral - 4.7%, subTenon-46.9%, peribulbar-19.5%, retrobulbar-0.5%
- Blocks administered by ophthalmologists in 56.7% cases and by anesthetists in 42.4% cases

Elly et al: Eye 2008

Local/Regional Anesthesia Techniques

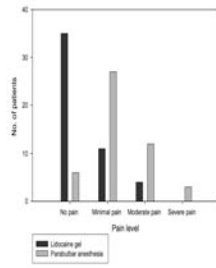
	Topical	Sub-Tenons	Peribulbar	Retrobulbar
Pain on block administration	0 or -	+ or ++	++ or +++	+++
Surgical pain prevented	--	++	++	++
Globe akinesia	---	0 or +	++	++
Eyelid sensation blocked	---	+	+	+
Visual sensations experienced	+++	++ or +	+	+

+ = strength of affirmative evidence
 0 = insufficient evidence
 - = strength of contrary evidence

Vann et al: Anesthesiology 2007; 107: 502-8

Topical Analgesia Vs. Injection Block

- Topical analgesia with 2% lidocaine gel without systemic sedation was as effective as paravulbar block in patients undergoing phacotrabeculectomy
- Surgeon's experience and surgical duration crucial (<30 min)
- Limitations of topical anesthesia: corneal haze after repetitive use



Petrou et al. Ophthalmology 2008; 115: 752

Patient Suitability For Topical Anesthesia For Eye Surgery

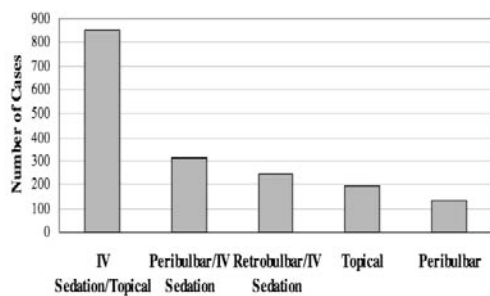
- Surgeons' experience and skill
- Expected duration of surgery (>30 min)
- Preoperative conditions that would prohibit awake patient (e.g., claustrophobia, inability to lay flat)
- Response to preoperative eye measurements (e.g., tonometry, ultrasound)
- Patient's expectations and preferences
- Varies between geographic locales, income levels

Sedation-Analgesia Techniques For Eye Surgery

Sedation-Analgesia Technique

- None
- Oral sedation and/or analgesia
 - Diazepam (5-10 mg, po, 1-2 h preop)
 - Acetaminophen (1 gm, po, 1-2 h preop)
- IV, hypnotic-sedatives and/or opioids
 - Propofol (15-75 mg)
 - Midazolam (0.5 - 3 mg)
 - Fentanyl (25-75 g)
 - Remifentanyl (50-100 g)

Anesthesia For Cataract Surgery: AAHC-IQI Study



AHRQ Evidence Report: Anesthesia Management During Cataract Surgery

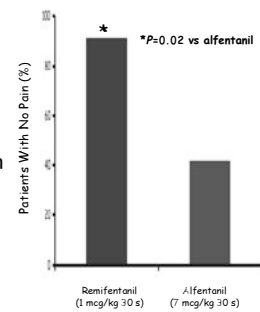
- Sedation strategies
 - No evidence that one strategy (oral vs. IV or IM) is superior to other
 - Greater intraop pain with topical than injection blocks
 - Higher postop drowsiness and nausea with IV sedation
 - High patient satisfaction regardless of strategy
- Specific agents used for local anesthesia: insufficient evidence to suggest superiority of one agent over other
- Complications related to anesthesia/sedation
 - www.ahrq.gov/clinic/epcsums/anestsum.htm
 - techniques are rare (e.g., globe rupture and MT)

Remifentanyl For Eye Block: Safe and Effective as Sole Agent

- Rapid onset (~1 min)
- Ultra-short duration (5-10 min), no cumulation,
- Easy titration
- Dose: 0.05 -0.1 g/kg
- Titrated (10 g/ml) to drop in respiratory rate, drooping eye lid
- Educate surgeon: expectations differ from

Remifentanyl vs. Alfentanil: Analgesic Efficacy During Placement of Eye Block

- Remifentanyl is easily titratable to maintain adequate respiration
- Fewer remifentanyl patients experienced pain than alfentanil patients
- Adverse events reduced with the concomitant use of midazolam 2 mg, which



Dexmedetomidine For Eye Surgery

- Provides both sedation and analgesia, with no respiratory depression
- Useful for sedation during eye surgery under local/regional anesthesia
 - Patient feels claustrophobic after draping
 - Patient who may benefit from local techniques, but may not be able to lay flat
 - OSA patient who has apnea episodes and wakes up with sudden movements
- Side effects: hypotension, bradycardia

Dexmedetomidine Sedation For Cataract Surgery

- Patients (n=44) undergoing cataract surgery under peibulbar block randomized
 - Dex 1 g/kg bolus over 10 min and 0.1-0.7 g/kg/h infusion titrated to Ramsay sedation score of 3
 - Midazolam 20 g/kg followed by 0.5 mg bolus
- Dex patients had lower heart rate and mean arterial blood pressure, higher patient satisfaction, delayed readiness for discharge
 - Alhashemi JA: Br J Anaesth 2006; 96: 722-6
- Dex 1 g/kg bolus was adequate in most patients

Outcome and Safety Of Anesthetic and Sedation

ASA Closed Claim Analysis

- Patient movement during eye surgery was the second most common cause of eye injury associated with anesthesia
- 1/5th of MAC claims occurred during eye surgery
- 3/4 of patients injured during sedation received combination of 2 or more drugs
 - Gild et al: Anesthesiology 1992; 76: 204-8;
 - Bhananker et al: Anesthesiology 2006; 104: 228-34

Complications of Sedation-Analgesia

- Study of 19,250 cataract surgery patients
 - 26% had topical, 74% injection blocks
 - IV sedation increased adverse events
 - Odds ratio increased from 9.8-12.3 to 16.6-30.2 with more than one sedative (e.g., midazolam + propofol)
 - Odds ratio increased to 30.7 with sedative and opioids
 - Most of the adverse events were minor (e.g., hypotension, bradycardia)
- Katz et al: Ophthalmology 2001; 108: 1731-6

Complications of Sedation and Analgesia

- Weak evidence that sedation improved anxiety control, pain relief or patient satisfaction
 - Insufficient evidence that any class of sedative was associated with improved outcome
 - Surgeon specific factors such as length of surgery greatly influence anesthesia needs and patient outcomes
- Schein et al: AHRQ, Dec 2001. www.ahrq.gov/clinic/epcsums/anestsum.htm

Complications of Anesthetic Techniques: UK National Health Database

- One or more complications in 4.3% of 38,058 regional blocks (excluding topical)
- Minor complications were 2.3 times more common with sub-Tenon block ($p < 0.001$)
- Serious (sight or life) complications in 0.066%
- Sharp needle techniques had 2.5 fold higher risks of serious complications compared with sub-Tenon ($p = 0.026$)

Need For Anesthesia Provider

During Eye Surgery

Patient Monitoring Personnel

- None
- Registered nurse (surgeon supervised)
- Anesthesia trained personnel (registered nurse or respiratory therapist)
- Anesthesia practitioner readily available
- Anesthesia practitioner present in the OR

Anesthesia Provider Interventions

- Surgeries (n=1006) in an ASC performed under peribulbar block administered by anesthesiologist
 - 33.9% of patients required at least 1 intervention
 - Patients with age < 60 years required more interventions than older patients (61% vs 36.5%)
 - Medical conditions requiring interventions: systemic hypertension, pulmonary disease, renal disease, previous or current cancers
 - Unable to identify in advance patients who would benefit from anesthesia provider
- Rosenfeld et al: Ophthalmology 1999; 106: 357-60

Anesthesia Provider and Eye Surgery

- RNs, in a VA hospital, monitored patients undergoing cataract surgery
- Anesthesiologist was readily available
- 8.9% cases required anesthesia consultation, 1/270 patients anesthesiologist remained in OR
- Consultation greater in ASA 3 (vs. ASA 1 or 2) patients (16% vs. 3.3%)
- Causes for consultation included ECG interpretation and IV catheter placement

Arntsen et al. J Cataract Refract Surg 2006; 32: 1115-8

Need For Anesthesia Provider During Eye Surgery Questioned

- Observational study in Australian ASC
- Patients (n=7508) undergoing cataract surgery under local, intracameral, subtenons block
- 88.7% (n=6661) patients did not have an anesthesia practitioner during the procedure
- No intraoperative complications
- Careful preop screening and patient selection critical in maintaining low complications

Arntsen et al. J Cataract Refract Surg 2006; 32: 1115-8

Anesthesia Providers During Eye Surgery

- Survey of International Ophthalmologists
 - Do you routinely use of anesthesia providers for monitoring during eye surgery under local/regional anesthesia?
 - 96% of American ophthalmologists
 - 97% of Australian ophthalmologists
 - 31% Malaysian ophthalmologists
 - 18% Thai ophthalmologists

Eichel and Goldberg, Clin Experiment Ophthalmol 2005; 33: 469-72

Eye Surgery Under Sedation: Is Anesthesia Practitioner Necessary

- Expert panel of surgeons and anesthesiologists
- Prefer, eye blocks with IV sedation and presence of an anesthesiologist during the case
- Estimated costs of this strategy greater than the second most preferred strategy (i.e., oral sedation, block anesthesia, anesthesiologist available, but not physically in OR): \$324 vs. \$42
- Anesthesia care justified based on patient and surgeon satisfaction

Arntsen et al. J Cataract Refract Surg 2006; 32: 526-36; www.ahrq.gov/clinic/epcsums/anestsum.htm

Patient Satisfaction With Eye Surgery

- Patient satisfaction high irrespective of sedation strategy or anesthetic technique
 - Schein et al: AHRQ study
- In a Canadian community hospital, anesthesiologist was considered important or very important by 69.9% preoperatively and 87.6% postoperatively
 - Fung et al: Anesth Analg 2005; 100: 1644-50
- Predictors of patient satisfaction
 - Level of preop anxiety, incidence of postop pain, surgeon

S u m m a r y

- Newer surgical techniques have changed the anesthetic techniques and sedation strategies
- There no evidence that one local/regional anesthesia technique or sedation-analgesia regimen is superior to the others
- Anesthesia and sedation choices made based solely on surgeon skills and patient expectations
- Involvement of an anesthesia practitioner in eye surgery is based on costs, anesthesia

The Anti-Coagulated Patient and Ophthalmic Surgery

Gary L. Fanning MD

Former Director of Anesthesiology and Medical Director
Hauser-Ross Eye Institute
Sycamore IL

The purposes of this presentation are to 1) review the pharmacology of warfarin and a few commonly used antiplatelet drugs and to 2) review the literature regarding the management of patients presenting for cataract surgery who are taking these drugs.

Over half a century ago, the substance dicoumarol was discovered to be the offending agent responsible for the hemorrhagic deaths of cattle eating sweet clover hay. The substance was patented as an anticoagulant in 1941. Initially it was used as a rodenticide and it continues to be used this way. Perhaps the most famous of the first patients given warfarin (a synthetic form of dicoumarol) as a therapeutic anticoagulant was President Dwight Eisenhower following his myocardial infarction in 1955. Ultimately warfarin has become a widely used anticoagulant to prevent thromboembolic complications in a variety of patients, including those with deep venous thrombosis, atrial fibrillation, and prosthetic heart valves. It is also used to prevent myocardial infarction in certain high-risk patients and to prevent stroke and/or recurrent infarction in patients with acute myocardial infarction. About 2 million patients start warfarin therapy each year in the United States, so the probability of encountering them in an ophthalmologic practice is very high.

A thorough review of the pharmacokinetics and pharmacodynamics of warfarin, the most commonly prescribed Vitamin K antagonist (VKA), can be found in the references by Ansell et al (1), Jacobs (2), and Du Breuil and Umland (3). A brief summary of the most important points follows here. The coagulation system is dependent upon a number of factors, four of which are dependent on the action of vitamin K for their production: II (prothrombin), VII, IX, and X. These factors require gamma-carboxylation by the liver in order to have their proper procoagulant activity, and vitamin K is required for gamma-carboxylation. Warfarin interferes with the action of vitamin K by inhibiting a pair of reductase

enzymes responsible for the cyclic interconversion of vitamin K and vitamin K epoxide. As a result, the factors II, VII, IX, and X which are produced are only partially carboxylated or decarboxylated proteins with greatly diminished procoagulant activity. Warfarin also interferes with the activity of three anticoagulant proteins (C, S, and Z), resulting in a procoagulant effect under certain circumstances. The warfarin-vitamin-K relationship is a competitive one, and increasing or decreasing vitamin K intake during treatment with warfarin can have dramatic effects.

Warfarin occurs in two isomeric forms, R and S, the latter of which is the more potent by a factor of five (1). It is rapidly absorbed from the GI tract and reaches peak blood levels in about an hour and a half. It is highly (99%) protein bound, mostly to albumin, and accumulates in the liver. Its half-life is about 36-42 hours, or about a day and a half. The most important metabolic pathway for the destruction of the potent S-isomer is by way of the hepatic cytochrome P450 2C9 microsomal enzyme system. There are at least five genetic variations of this enzyme, resulting in individuals who are especially sensitive to the effects of warfarin because they are unable to metabolize it properly. Another genetic mutation results in warfarin's reducing factor IX to 1-3% of its normal activity instead reducing it 30-40% as it does in most patients. This obviously may increase hemorrhagic risks during warfarin therapy (4, 5).

Other factors besides genetics influence the pharmacokinetics and pharmacodynamics of warfarin. First among these is diet. Consuming foods (green vegetables) and/or supplements high in vitamin K will reduce the efficacy of warfarin therapy, resulting in higher doses being required to maintain a therapeutic response. Changes in the diet may result in either an exaggerated response to warfarin leading to hemorrhagic risk or a lessening of the anticoagulant effects leading to thromboembolic risk. In addition to foods, a number of botanicals and herbal supplements may influence the action of warfarin. Ansell et al (1) and the following website list a number of such substances: <http://www.uspharmacist.com/old-format.asp?url=newlook/files/Drug/Warfarin.htm>

Drugs may also influence warfarin's effects. They may act by interfering with warfarin's metabolism, reducing its clearance (trimethoprim-sulfamethoxazole, cimetidine, amiodarone). They may increase the drug's clearance, lessening the anticoagulant effect (barbiturates, rifampin, long-term alcohol use). Second and third generation cephalosporins increase the anticoagulation effects of warfarin by an action similar to that of warfarin itself: inhibition of the cyclic interconversion of vitamin K and vitamin K epoxide. Thyroxine can augment warfarin's effects by increasing the metabolism of the vitamin K-dependent coagulation factors. The antiplatelet drugs (aspirin, NSAIDs) increase the risks of bleeding in patients on warfarin because of their antiplatelet effects. Ansell et al (1) and the following website are good sources for finding a variety of drug interactions with warfarin: <http://www.drugs.com/pro/warfarin.html>

In addition to environmental factors and simultaneous drug therapies, gender and age also influence warfarin treatment. Garcia et al (6) published data showing that median doses of warfarin to maintain a therapeutic level were significantly reduced by advancing age and that in all age groups women required lower doses than men. Patient compliance also greatly affects warfarin treatment. Patients may take too much drug or may stop taking it inappropriately. Because of the multiple factors impacting oral anticoagulant therapy with warfarin, it is extremely important to monitor therapy carefully and at appropriate intervals.

The time-honored measurement of warfarin activity is the prothrombin time (PT) test. The test is performed by adding thromboplastin and calcium to a sample of citrated plasma. Because the activities of thromboplastins vary, the one used in the local laboratory is given a designation (ISI) which indicates its responsiveness. This figure is then used to convert the ratio of the patient's PT to a control PT into a figure known as the International Normalized Ratio (INR). An INR of 1.0 is considered normal. For most patients a target INR would be 2.5 with a range of 2.0-3.0. When comparing efficacy to complications (i.e., bleeding), the author has not found data indicating a need to have the INR above 3.5 or 4, even in patients with prosthetic heart valves. In fact, Hylek and

Singer (7) reported many years ago that the incidence of intracranial hemorrhage rises dramatically above an INR of 4. In terms of the frequency of monitoring the patient's INR, it is necessary to monitor as often as daily at the beginning of therapy until one sees how the patient responds. Once therapy is well established and appears stable, monitoring the PT every 4 weeks is recommended (1). Prior to elective surgery in patients who remain on warfarin, it is recommended that the INR be measured just prior to surgery (Reference 3, Page 1040).

Not all patients with pharmacologically altered coagulation states are taking warfarin. In fact, patients taking antiplatelet drugs (APD) are more commonly encountered in our clinical practices than patients taking warfarin. These drugs interfere with the coagulation process by inhibiting the activation of platelets in a variety of ways. An excellent review of these drugs, their pharmacology, and the indications can be found in Messmore et al (8). A brief summary of some of the information about the more frequently used ones in that review follows.

Aspirin, the most commonly employed APD, is taken daily by millions of people, both as a formally prescribed medication and as a drug recommended by friends, family, and media advertisements. It is used for a variety of primary and secondary indications in the prevention of coronary events, TIA, stroke, and thromboembolic disease. Aspirin and some other NSAIDs interfere with platelet function by inhibiting cyclooxygenase 1 (COX 1), an enzyme responsible for the production of thromboxane A2 (TXA2), a very powerful platelet activator. In the case of aspirin, this inhibition is irreversible, while with other NSAIDs it is reversible when the agent has cleared the circulation (9). As the platelets last for 7-10 days in circulation, the full effects of aspirin-induced platelet inhibition take 7-10 days to return to normal after aspirin is stopped. Only 100mg of aspirin per day are required to produce the full effect and doses as low as 81mg a day have been shown to be quite effective.

Platelet activation can be inhibited by several other means. Two of the more commonly prescribed APD are clopidogrel (Plavix®) and ticlo-

pidine (Ticlid®), members of the thienopyridines. These drugs block the action of ADP, a potent activator of platelet aggregation. A few days of therapy (4-7) results in a steady state of inhibition, and cessation of therapy brings a return to normal in 7 days. The clinical indications and results with these drugs are not identical with aspirin and are not within the scope of this presentation. The reader is referred to Messmore et al (8) for a thorough discussion.

In spite of evidence in the literature, there remains some controversy regarding the safety of allowing anticoagulated patients presenting for cataract surgery to remain on warfarin therapy through the perioperative period. Fears regarding disastrous intraocular bleeding during surgery (such as would occur during expulsive choroidal hemorrhage) or retrobulbar hemorrhage during the orbital block are weighed against the fears of inducing embolic or thrombotic complications when oral anticoagulation is stopped temporarily during this period. The remainder of this presentation will examine these issues by looking at the literature to see if there is compelling clinical evidence to help us manage these patients.

In 1993, McCormack et al (10) from the Royal Eye Hospital in Manchester, UK, reported on 41 patients anticoagulated with Vitamin K antagonists (VKA) undergoing 50 surgical procedures, 39 of which were cataract procedures. Thirty-nine of the procedures were performed under orbital regional anesthesia, the remainder under general. The INR immediately prior to surgery ranged from 1.1 to 4.9. There were no hemorrhagic complications in the group. The authors concluded that "most ophthalmic surgical procedures can be safely performed whilst the patient is therapeutically anticoagulated." (10) There are a few problems with this study. First of all, the number of patients is small. Secondly, some of the patients, while taking VKAs, were not therapeutically anticoagulated, while others were well above the recommended therapeutic range. Nonetheless, they demonstrated that ophthalmic anesthesia and surgery can be performed safely while patients are taking warfarin.

Assia et al (11) divided a group of 61 patients receiving aspirin prior to cataract surgery into three groups. Group A was allowed to contin-

ue aspirin without interruption. Group B stopped aspirin 2-5 days preoperatively. Group C stopped it 7-10 days preoperatively. There were no differences in the postoperative outcomes and little difference in intraoperative bleeding. Group A patients required slightly more diathermy, but otherwise there was no significant difference between groups.

Hirschman (12) reported on the results of 2,241 cataract procedures performed on 1842 patients, 53% of whom were on either APDs or warfarin. The data was gathered from a number of eye surgery centers by members of the Ophthalmic Anesthesia Society. Two patients suffered hyphemas, one taking anticoagulants, the other not. Seventeen patients suffered minor bleeding problems from the orbital block, 9 of them on anticoagulants and 8 not. Of those 17, 9 were bruising at the injection site and 8 were subconjunctival hemorrhages. There were no major complications reported. The INR range of the patients taking warfarin was not reported.

Katz et al (13) examined the records of 19,283 cataract surgeries from nine centers in the USA and Canada in the years from 1995-1997. In arguably the largest study of its kind, they looked for the following intraoperative and postoperative outcomes: retrobulbar hemorrhage, vitreous or choroidal hemorrhage, hyphema, TIA, stroke, DVT, myocardial ischemia, and MI. 24% of their patients were taking aspirin, 4% warfarin, 0.4% aspirin and warfarin, and 72% none. They looked at the above listed outcomes in patients who continued their anticoagulants prior to surgery, in those who discontinued them, and to those who did not take them. As there were no differences noted in outcomes in those who continued or discontinued their anticoagulants, they recommended that patients not be taken off these medications prior to cataract surgery. They pointed out, however, that, because the incidence of these outcomes is so low, it would take a sample size of at least 20,000 patients on anticoagulants in order to have a definitive answer. Not reported in this study were the exact details of the orbital regional anesthesia employed (simply reported as retrobulbar and peribulbar) nor the INR ranges of the patients on warfarin. The study does give strength to the arguments in favor of continuing anticoagu-

lants, especially since the numbers involved in this study are so much greater than in all others.

Another large study was reported in the dermatology literature to determine the risk of taking patients off anticoagulants prior to cutaneous surgery. Kovich and Otley (14) surveyed the members of the American College of Mohs Micrographic Surgery and Cutaneous Oncology and reported on 46 patients who suffered thrombotic complications when anticoagulation was withheld prior to cutaneous surgery. 54% of these patients had warfarin withheld, 39% had aspirin stopped, 4% had both, and the rest it could not be determined which had been stopped. Their calculated incidences were 1 event per 12,816 procedures overall, 1 in 6219 when warfarin was withheld, 1 in 21,448 when aspirin was withheld, and 1 in 16,917 when both were withheld. Again, these numbers demonstrate the low incidence of complications. However, the complications of cutaneous surgery when anticoagulants are continued are equally low and they pale in seriousness when compared to the complications associated with stopping anticoagulants. Unfortunately, the study did not report the incidence of thrombotic events in patients undergoing cutaneous surgery who were not taking anticoagulants at all.

Clopidogrel has been reported as a potential problem by more than one author. Salam and Raines (15) reported on 16 cataract surgery patients receiving clopidogrel. Of those who received subTenon's anesthesia, 25% exhibited significant subconjunctival hemorrhage, compared to 0% of those receiving peribulbar, topical, or general. Kumar et al (16) looked at the incidence of subconjunctival hemorrhage in 255 patients having cataract surgery under sub-Tenon's anesthesia. 65 patients were taking warfarin, 40 clopidogrel, 75 aspirin, and 75 controls took no anticoagulants. The incidence of subconjunctival hemorrhage was 19% in the control group, 21% in the aspirin group, 35% in the warfarin group, and 40% in the clopidogrel group. The warfarin and clopidogrel groups were statistically different from the control and aspirin groups. Herbert et al (17) reported two cases of patients undergoing vitreoretinal surgery while on combined therapy with clopidogrel and diclofenac in one and clopidogrel and aspirin in the other. Both suffered severe

intraocular hemorrhage during surgery, resulting in severely compromised visual results. The first patient had his other eye operated on after discontinuing both clopidogrel and diclofenac and had a good outcome without hemorrhage. Davies (18) reported the case of a patient taking combined therapy with clopidogrel and aspirin who suffered major intraocular bleeding during cataract surgery. Based on this one experience plus the known higher incidence of spontaneous systemic hemorrhage in patients on combined therapy (19), at his institution they now discontinue clopidogrel one week before surgery if the patient is on combined therapy, but they continue it uninterrupted as they would aspirin if on clopidogrel alone.

While it may be safe to leave patients on anticoagulants for cataract surgery, the same cannot be said of all ophthalmic surgery. This year Law et al (20) published a report of 794 patients who underwent glaucoma surgery during the years 1998-2005. 347 patients were taking either warfarin or antiplatelet drugs. They were compared with 347 patients taking none of these. Those patients taking anticoagulants had a 10% incidence of hemorrhagic complications, compared with about 4% of controls. 23% of patients on warfarin compared with 8% of patients on antiplatelet drugs had complications. Patients who continued their warfarin into the surgery period had a 32% incidence. These complications had a profound negative impact on surgical outcomes. Cobb et al (21) reported similar results in trabeculectomy patients. They found, however, that aspirin patients, while having a higher incidence of hyphema, did not have a significantly higher incidence of surgical failure than controls. Patients taking warfarin, on the other hand, did have a higher incidence of trabeculectomy failure.

Conclusions and Recommendations

The literature is clear that, for elective cataract surgery, patients can be continued on anticoagulant and antiplatelet drugs during the entire perioperative period. I think we can be less secure for other ocular surgery, such as vitreoretinal and glaucoma surgery, and we certainly have to question the safety of keeping patients on combined therapy, especially in non-cataract eye surgery. Aspirin alone and perhaps clopidogrel alone may be safe for vitreoretinal sur-

gery. Based upon my own reading of the literature and 17 years of practice in which I have 1) cared for over 27,000 patients, 2) experienced no intraocular complications related to anticoagulant or antiplatelet therapy, and 3) cancelled only four patients because of retrobulbar hemorrhage that concerned me (all did fine and none were on anticoagulants), I suggest the following recommendations for elective cataract surgery:

1. Do not stop APDs such as aspirin, other NSAIDs, or clopidogrel. Expect a few more minor hemorrhagic occurrences, such as subconjunctival bleeding or bruising at the injection site.
2. Do not stop warfarin. Expect the same minor occurrences as noted above.
3. Good luck communicating this to the patients' primary care physicians!
4. For patients taking warfarin, know the prothrombin time (INR) as close to the time of surgery as possible. If possible, obtain a CLIA-waived testing unit that can be used to measure the INR in the clinic when the IV is started. A reasonably rational care plan is to have the primary care physician measure the INR 4-5 days preoperatively, followed by your measuring it on the day of surgery. This gives the primary care physician time to make necessary adjustments and ought to reduce the number of cancellations due to undesirable INRs. In the absence of the ability to measure the INR routinely on the day of surgery in the clinic, insist it be done the day before surgery and no more than 3 days before (i.e., a Friday measurement prior to Monday surgery).
5. Try to have the patient's INR in the therapeutic range, 2-3. As the incidence of serious hemorrhagic complications begins to rise unacceptably at an INR of 4 (7), cancel elective surgery somewhere short of that INR. Some clinicians will cancel if over 3, some if over 3.5. Current knowledge is important in decision making, and an INR that is more than three days old is unacceptable, even if it has been stable for a year, because of the pharmacokinetics of warfarin and because of the multitude of factors that will adversely affect the INR. We recently saw a patient whose INR had been stable at 2-2.5 for a long time. On the day before surgery it was over 8! There are too many variables affecting the patient's prothrombin time when

taking warfarin. For elective surgery, the patient ought to be in optimal condition. For a patient taking warfarin, this means having an INR in the accepted therapeutic range. We are fortunate to be able to measure the pharmacodynamics effects of warfarin, unlike the APDs. Take advantage of it.

6. Don't be happy if the patient's INR is 1.3 (i.e., below the accepted therapeutic range of 2-3) on the day before surgery. Patients are placed on warfarin to prevent very serious cardiovascular events. If the INR is below the therapeutic range while the patient is taking the drug, be certain that the primary care physician is aware of it so that an appropriate adjustment can be made immediately postoperatively.
7. It is essential in all patients, but especially in anticoagulated patients, that you perform orbital regional anesthesia safely by avoiding the most vascular areas of the orbit. These are the areas in the upper orbit, especially the superonasal quadrant, and in the deep orbit. Always use short needles (1" is plenty long enough, 1.5" is too long and simply unacceptable), and don't aim at the orbital apex. Use the inferotemporal corner and/or the medial canthal adipose tissue compartments, where there are few large vessels to hit.

References

1. Ansell J, Hirsch J, Poller L, Bussey H, Jacobson A, Hylek E. The pharmacology and management of the Vitamin K antagonists. The seventh ACCP Conference on Antithrombotic and Thrombotic Therapy. *Chest* 2004; 126:204S-233S.
2. Jacobs LG. Warfarin pharmacology, clinical management, and evaluation of hemorrhagic risk for the elderly. *Cardiol Clin* 2008; 26:157-167.
3. Du Breuil AL, Umland EM. Outpatient management of anticoagulation therapy. *American Family Physician* 2007; 75:1031-1042.
4. Mannucci PM. Genetic control of anticoagulation. *Lancet* 1999; 353:688-699.
5. Oldenburg J, Quenzel E-M, Harbrecht V, et al. Missense mutations at ALA-10 in the factor IX propeptide: an insignificant variant in normal life but a decisive cause of bleeding during oral anticoagulant therapy. *Br J Haematol* 1997; 98:240-244.
6. Garcia D, Regan S, Crowther M, et al. Warfarin maintenance dosing patterns in clinical practice. Implications for safer anticoagulation in the elderly population. *Chest* 2005; 127:2049-2056.

7. Hylek EM, Singer DE. Risk factors for intracranial hemorrhage in outpatients taking warfarin. *Ann Intern Med* 1994; 120:897-902.
8. Messmore HL, Jeske WP, Wehrmacher W, et al. Antiplatelet agents: current drugs and future trends. *Hematol Oncol Clin N Am* 2005; 19:87-117.
9. Konkle BA, Simon D, Schafer AI. Hemostasis, thrombosis, fibrinolysis, and cardiovascular disease. In: Libby: Braunwald's Heart Disease: a textbook of cardiovascular medicine, 8th edition. 2007; Chapter 82, page 2069. Saunders, Philadelphia, PA.
10. McCormack P, Simcock PR, Tullo AB. Management of the anticoagulated patient for ophthalmic surgery. *Eye* 1993; 7:749-750.
11. Assia EI, Raskin T, Kaiserman I, et al. Effect of aspirin intake on bleeding during cataract surgery. *J Cataract Refract Surg* 1998; 24:1243-1246.
12. Hirschman DR. A study of the safety of continued anticoagulation for cataract surgery patients. *Nurs Forum* 2006; 41:30-37.
13. Katz J, Feldman MA, Bass EB, et al. Risks and benefits of anticoagulation and antiplatelet medication use before cataract surgery. *Ophthalmology* 2003; 110:1784-1788.
14. Kovich O, Otley CC. Thrombotic complications related to discontinuation of warfarin and aspirin therapy perioperatively for cutaneous operation. *J Am Acad Dermatol* 2003; 48:233-237.
15. Salam T, Raines MF. Clopidogrel and intraocular surgery: complicated or uncomplicated? *Grand Rounds* 2007; 7:58-60.
16. Kumar N, Jivan S, Thomas P, McLure H. Sub-Tenon's anesthesia with aspirin, warfarin, and clopidogrel. *J Cataract Refract Surg* 2006; 32:1022-1025.
17. Herbert EN, Mokeke B, Williamson TH, Laidlow DAH. Haemorrhagic vitreoretinal complications associated with combined antiplatelet agents. *Br J Ophthalmol* 2006; 90:1209-1210.
18. Davies BR. Combined aspirin and clopidogrel in cataract surgical patients: a new risk factor for ocular hemorrhage? *Br J Ophthalmol* 2004; 88:1226-1227.
19. Yusuf S, Zhao F, Mehta SR, et al. Effects of clopidogrel in addition to aspirin in patients with acute coronary syndromes without ST-segment elevation. *N Engl J Med* 2001; 345:494-502.
20. Law SK, Song BJ, Yu F, et al. Hemorrhagic complications from glaucoma surgery in patients on anticoagulant therapy and antiplatelet therapy. *Am J Ophthalmol* 2008; 145:736-746.
21. Cobb CJ, Chakrabarti S, Chadha V, Sanders R. The effect of aspirin and warfarin therapy in trabeculectomy. *Eye* 2007; 21:598-603.

Pediatric Ophthalmic Surgery and Anesthesia

Oya Yalcin Cok MD

Dept of Anesthesiology and Reanimation
Adana Teaching and Research Center
Baskent University
Adana Turkey

The objectives of anesthesia for pediatric ophthalmic surgery include akinesia, avoidance of surgery-associated adverse events and awareness of potential interactions between ophthalmic drugs and anesthetics in children. The anesthetic plan must meet both the requirements of pediatric anesthesia and special needs of ophthalmic surgery.

The provision of safe anesthesia in children depends on meticulous knowledge of age-related differences in anatomy and physiology as well as pharmacology of drugs. Pediatric patients almost always require general anesthesia during ophthalmic surgery. However, sedation with intense analgesia may be adequate for brief procedures.

Anesthetic planning starts at the preoperative evaluation. Children undergoing ophthalmic surgery may be otherwise healthy, premature, ex-premature or may suffer from congenital disorders. Family and personal history may reveal familial disorders or syndromes requiring special attention. Potential difficulties in anesthetic management may be noted at this first visit and, if required, further investigation may be warranted. Thus, perioperative period must be planned according to the features of the patient and the type of surgery.

Preoperative sedation preferences may vary between clinics, however appropriate use of sedatives may provide a less traumatic experience both for the child and his or her parents while placing IV access or transferring the patient to the operation room. Oral administration of midazolam or ketamine is well-tolerated in comparison to painful intramuscular or intranasal routes. Perioperative monitoring and securing airway equipment should be established considering that the anesthesia team would be in a remote position during the operation. The anesthesia team should also be well-informed about the surgery plan to ensure that anesthetic plan fits appropriately.

Pediatric ophthalmic procedures consist of strabismus surgery, probing of nasolacrimal ducts, retinopathy of premature (ROP), penetrating eye injuries, congenital and traumatic cataract,

glaucoma, intraorbital tumors, and chalazion. Some of these procedures require special attention since well-described problems may accompany them. These problems include oculocardiac reflex, malign hyperthermia and post-operative nausea and vomiting during strabismus surgery, problems of premature during ROP, management of intraocular pressure and patient with a full stomach during traumatic eye injuries. Also, the anesthesia team should be aware of the administered ophthalmic drops to monitor possible adverse events, since several surgeries require dilation of the pupils prior to operation and mydriatics and cycloplegics may present with side effects such as interaction with anesthetics or toxicity. Pediatric patients undergoing ophthalmologic surgery are mostly out-patients. In the postoperative period, prophylactic or rescue anti-emetics for PONV and pain therapy must be ordered particularly according to needs of patients. In summary, managing pediatric patients during ophthalmic surgery requires thorough understanding of physiology of pediatrics and pharmacology of drugs and knowledge of ophthalmic surgery to support practice.

References

- Allison CE, De Lange JJ, Koole FD, Zuurmond WW, Ros HH, van Schagen NT A comparison of the incidence of the oculocardiac and oculo-respiratory reflexes during sevoflurane or halothane anesthesia for strabismus surgery in children. *Anesth Analg*. 2000 Feb;90(2):306-10.
- Blumberg D, Congdon N, Jampel H, Gilbert D, Elliott R, Rivers R, Munoz B, Quigley H. The effects of sevoflurane and ketamine on intraocular pressure in children during examination under anesthesia. *Am J Ophthalmol*. 2007 Mar;143(3):494-9.
- Chhabra A, Pandey R, Khandelwal M, Subramaniam R, Gupta S. Anesthetic techniques and postoperative emesis in pediatric strabismus surgery. *Reg Anesth Pain Med*. 2005 Jan-Feb;30(1):43-7.
- Choi SH, Lee SJ, Kim SH, Kim JH, Kwon HH, Shin YS, Lee KY. Single bolus of intravenous ketamine for anesthetic induction decreases oculocardiac reflex in children undergoing strabismus surgery. *Acta Anaesthesiol Scand*. 2007 Jul;51(6):759-62.
- Gayer S. Key components of risk associated with ophthalmic anesthesia. *Anesthesiology*. 2006 Oct;105(4):859.
- Gayer S, Lubarsky DA. Cost-effective antiemesis. *Int Anesthesiol Clin*. 2003; 41(4):145-64.
- Gayer S, Tutiven J. Anesthesia for pediatric ocular surgery. *Ophthalmol Clin North Am*. 2006 Jun;19(2):269-78.

- Henneberg SW, Nilsson LB. Acute paediatric pain. Review. *Current anaesthesia and Critical Care* 2007;18, 126-134
- James I. Anaesthesia for pediatric eye surgery. Continuing Education Anaesthesia, Critical Care & Pain 2008; 8(1): 5-10
- Jones JG, MacKinnon B, Good WV, Hardy RJ, Dobson V, Palmer EA, Phelps DL, Quintos M, Tung B; Early Treatment for Retinopathy of Prematurity Cooperative Group. The early treatment for ROP (ETROP) randomized trial: study results and nursing care adaptations. *Insight*. 2005 Apr-Jun;30(2):7-13.
- Kopecky G. Pediatric ophthalmology and anesthesia pearls in the operating room. *Insight*. 2005 Apr-Jun;30(2):32-7.
- Kumar CM, Dodds C. Anaesthesia for paediatric ophthalmological surgery. In: Kumar C, Dodds C, Fan-ning G, eds. *Ophthalmic Anaesthesia*. Lisse: Swets & Zeitlinger BV, 2002: 127-144
- Marcus EN, Gayer S, Anderson DR. Medical evaluation of patients before ocular surgery. *Am J Ophthalmol*. 2003 Aug;136(2):338-9.
- McGoldrick KE, Foldes PJ. General anesthesia for ophthalmic surgery. *Ophthalmol Clin North Am*. 2006 Jun;19(2):179-91.
- Seidel J, Dorman T. Anesthetic management of preschool children with penetrating eye injuries: postal survey of pediatric anesthesiologists and review of the available evidence. *Paediatr Anaesth*. 2006 Jul;16(7):769-76.

The Cat's Out of the (Re-breathing) Bag: Ophthalmic Anesthesia in the Veterinary Anesthesiologist's World

Lesley J. Smith DVM

Clinical Associate Professor of Anesthesiology
University of Wisconsin School of Veterinary Medicine
Department of Surgical Sciences
Madison WI

This 40 minute session is intended to provide an entertaining introduction to the world of veterinary anesthesia as it pertains specifically to ophthalmic surgery. Veterinary patients come in all sizes, from 1 pound kittens to 1500 pound horses. Generally, our veterinary patients are less cooperative than their human companions who have presented them for our care. The species we deal with do not voluntarily hold still for local blocks or surgery performed under sedation, so the vast majority of them undergo general anesthesia for even minor ophthalmic procedures. Once anesthetized, there are species differences in the response to anesthet-

ic drugs, specifically with respect to globe rotation, degree of muscle relaxation, and physiologic parameters such as heart rate and blood pressure. Anesthetic recovery and safety to both the animal and personnel working with it can be a challenge, particularly in species with a strong "fight or flight" instinct, such as horses. Finally, there are species differences in the behavioral effects of opioids, the mainstay for systemic analgesia after major surgery. For example, cats can become very hyperthermic when given opioids and horses and ruminants will exhibit CNS excitation. This session will include case discussion with video and photographic material that will allow the attendee insight into the complexity, challenge, and fun of being a veterinary anesthesiologist.

Conducting a Study of Post-Anesthetic Complications in an ASC

Dan Simonson CRNA MHA

Spokane Eye Surgery Center
Spokane WA

Abstract: This lecture describes the experience of creating and conducting a study of post-anesthetic complications in a privately owned ASC. In order to make the study results available for dissemination, Institutional Review Board (IRB) approval had to be sought. The purpose of the study was not only to look at complications in our own facility, but to use it as a pilot study suitable for replication by other ophthalmic ASCs. The IRB documents and data collection materials will be made available to OAS members after completion of the study and review of techniques by a panel of experts.

1. Introduction

- a. At the 2007 OAS meeting in Chicago, Dr. David Guyton Lectured on "Strabismus Complications from Local Anesthetics"
- b. In his lecture, he described a high incidence of diplopia following retrobulbar block
- c. Several OAS members felt a desire to do a study of the incidence of diplopia in a modern high-volume ophthalmic anesthesia practice

2. The Importance of "Pilot" Studies

- a. Pilot studies- small studies performed

with the intention of growing them to larger samples sizes or multiple institutions, are important means of working out the "kinks" and procedural difficulties inherent in any successful clinical study.

3. Research in an ASC

- a. As the "Clinical Microsystem" where so much care is delivered, it is vital that ophthalmic ASCs conduct research. Academic institutions cannot replicate the environment in which we daily provide much of the ophthalmic surgical and anesthesia care delivered in the United States.
- b. We need to learn the techniques of our academic colleagues, and avail ourselves of the assistance offered in our communities for these projects.
- c. My RNs were extremely enthusiastic about the project. I appointed several to be "research nurses" to assist me- they loved it!

4. IRB Approval

- a. For any study that you plan to publish, you must obtain Institutional Review Board (IRB) approval
- b. Reputable peer-reviewed journals will not countenance a study that does not have such approval

5. Preparing for IRB Approval

- a. Create study documents
- b. Most important: the consent form
- c. The IRB will review all the documents and determine the type of approval necessary
- d. Complete review
- e. Expedited review
- f. Waiver of review

6. IRB

- a. My study was felt to be a type of "registry"- that is, because I was not altering the treatment of patients, but only recording the incidence of certain postoperative complications, it was not felt to require a full IRB review. I was granted an "expedited" review.
- b. However, I and my co-investigators had to take the NIH computer-based training course on the use of human subjects.
- c. National Institute of Health - Office of Human Subjects Research
- d. <http://ohsr.od.nih.gov/index.html>
- e. Collaborative Institutional Training

Initiative (CITI)

- f. <https://www.citiprogram.org/>
- g. Finally, after modifying my consent form a bit, I received approval from the IRB. They sent me a copy of my consent with their logo and approval info affixed to the bottom. This was to be my official consent form. It was now 4 pages long.
- h. Please email me if you would like copies of all of the study documents to modify for your own use.

7. Doing the Study

- a. Phase I: Preparing for data collection
 - i. Notifying surgeons and their staff
 - ii. Deciding where and how to ask the patient to read and sign the consent
 - iii. At first, I was going to let the surgeon's staff do it- but this proved unworkable
 - iv. Finally: My receptionists handed the patients the form, and asked them to read it while they were waiting to go back to surgery
 - v. Key Point: do not underestimate the logistics involved in getting consent. And the study is worthless for publication or even dissemination at a meeting if you do not get proper consent.
 - vi. At the suggestion of my "Research Nurse", I gave a sandwich gift certificate to the receptionist for every 10 patients successfully recruited.
- b. Phase II: Initial Data Collection
 - i. Our goal was 100 "clean" patients, so we planned on 120 so that we could account for those lost to follow-up and other contingencies.
 - ii. Having the two Research Nurses assisting me was incredibly important. They kept us on track, made sure the forms were fully completed, and entered the data from the forms into the computer.
 - iii. It took us a month to gather the 120 patients, even though we do about 450 retrobulbar blocks a month.
- c. Phase III: Follow-up Data Collection
 - i. Once the initial data was collected, we had to wait 3 months before contacting the patients to determine whether or not they had permanent diplopia.
 - ii. In the interim, my surgeons reported a couple of patients to me who had diplopia on their post-op visits. Both of these cases resolved. One patient, a lady, told me that it "reminds me of the problem I had

as a child- I used to have a problem with double vision when I was a girl". Obvious reference to an "unmasked phoria", where the local anesthetic and the albeit minor surgical trauma was enough to decompensate the mechanism her eyes had been using to maintain single vision.

8. Data Collection

- a. All this data is being entered into a Filemaker® database. Using a database program is vital to data collection and subsequent interpretation of results. One of the outcomes of this pilot study will be to develop a simple database collection program that can be used by those seeking to replicate the study.

9. The Next Step

- a. My plan is to go over the results of this 100-patient study with Dr. Guyton, Dr. Rivers, and other OAS members to create a study protocol that can be replicated by OAS members in their facilities.
- b. This will be done with an eye to simplifying the whole process as much as possible, but at the same time creating a multi-center study that will produce quality results.

10. Summary

- a. Participating and conducting studies such as this one is part of our professional responsibility to our patients.
- b. Active participation will be seen as the mark of a quality operation by Facility reviewers.
- c. Anyone interested in participation should contact me at: dsimonson@mac.com

Error Prevention: Wrong Site Surgery

Spencer L. Byrum BSM

Managing Partner
Convergent HRS, LLC
Weston FL

I've been spending a lot of time in Ambulatory Surgery Centers lately. Many of you whom I've met over the years when I've spoken at SEE, ACES, FASA, AAASC, and ASOA might not find that particularly surprising, but I'm becoming increasingly alarmed about the potential for unwanted outcomes in ophthalmology. Those of you who own or regularly operate in a surgery center need to be concerned that there are

significant risks to your practice as you increase your caseload. That's why I'm writing this article today.

Ophthalmology has always required a tremendous amount of precision. A person's sight is one of their most precious possessions and the surgeons, anesthesiologists, nurses, techs and other support staff in your surgery centers all bring their talents to bear on complex issues that invariably result in improved vision for your patients. Most of the outcomes you achieve are nothing short of miraculous for your patients' quality of life. It's a tremendous gift that you can give, but with that gift comes a level of responsibility that can simply not be taken for granted.

My observation is that many of you assume that the processes that you have always used in your ASC will prevent you from having an unwanted outcome like a wrong patient, wrong site, wrong implant, or wrong procedure. I've found a number of instances where that was simply not the case. Many complications, ranging from complex new regulations to more sophisticated equipment to decreased staff experience have caused dramatic changes over the past few years and saying "that's how we've always done it" does not provide sufficient protection for the patient, or for you, and your staff. I've discussed this dilemma with my colleagues Alan Reider and Allison Shuren, lawyers at the firm of Arent Fox, who specialize in this field, and they have seen many similar situations when evaluating their clients' compliance programs. They say that having a program on the shelf is appreciably different than having an active, effective compliance program that will ensure that your center is in line with the current regulations. Also, the crush of all of the additional external requirements that you and the staff have to deal with on a daily basis makes many of you feel that there is very little time left for patient care, and even less time for redesigning processes to keep up with the new requirements. To make things worse, reimbursements are down at the same time that the cost of equipment, insurance, salaries, and virtually everything else is up. It seems that the only way your ASC can make money is to do more cases.

Before you compress your surgical schedule to the breaking point, pack more people into clinic

slots, or sign up for more consults in an effort to bridge the financial gap, I want you to think about the potential implications. If your processes and procedures are stretched to the limit now, what will your results be if your answer is to simply work harder? Are you willing to bet your patients' trust (to say nothing of their sight), your career, your staffs' jobs, and your financial future that it is not possible for you or your staff to make a mistake?

Here are some recommendations for you to consider before you begin your next surgical schedule:

1. Make sure that everyone on your team, from the receptionist to the circulator, knows that it is your expectation that they speak up and let you know if something is "not right." That may seem to you as potential for opening Pandora's box, but in an evaluation of sentinel events conducted by the Joint Commission, a disproportionate number of unwanted outcomes occurred when someone on the team knew that something was wrong and did not, or would not, speak up.
2. Emphasize to your staff the need to standardize that way that they stock and prep both your exam rooms and your ORs. The potential for error associated with so many implants, medications, etc. requires that they have a reliable, reproducible set of processes so that what you need is there when you need it. Time compression associated with inadequate or incomplete processes is regularly the lead-in to the occurrence of an error.
3. Finally, ALWAYS take the time PRIOR to the procedure to PERSONALLY verify that you have the correct patient, are doing the correct procedure on the correct side, and that you are using the correct implant. The ultimate responsibility for your patients' welfare rests with you and not taking the few seconds necessary to personally validate these critical items during a concise pre-procedure timeout is unquestionably not in the best interest of your patient.

I know that it's difficult to practice medicine today. I also know that you're doing a terrific job of caring for your patients. The three recommendations listed are a composite of actions I've advocated to dozens of the surgery centers across the country. I hope that you'll give them serious consideration and then implement them immediately, because as busy as you are, "You don't have time not to"

Risk Management: Ophthalmic Anesthesia Liability

Anne M. Menke RN PhD

Risk Manager Ophthalmic Mutual Insurance Company
San Francisco CA

Based upon an review of eighteen years of ophthalmic anesthesia claims, Ophthalmic Anesthesia Liability using closed claims to present risk management recommendations to promote patient safety and minimize profes-

sional liability exposure. After participating in Ophthalmic Anesthesia Liability, ophthalmologists, anesthesiologists, and nurse anesthetists should be better able to:

- Evaluate the type of anesthesia
 - Determine the most appropriate anesthesia provider
 - Obtain informed consent for anesthesia
 - Respond to complications from anesthesia.
-

Administrative Issues for Today's Surgery Center - Begins on following page

Administrative Issues for Today's Surgery Center

Katherine S. Wilson RN MHA

AVP, HCA Clinical Services Group
 HCA Healthcare
 Nashville TN

WHAT ARE THE CHALLENGES?

- Movement to Pay for Performance
- Regulatory Changes
- Staff selection and competency
- Patient acuity
- Competition
- Declining reimbursement
- Increasing Costs

2

REGULATORY COMPLIANCE

- CMS
 Conditions of Coverage
- State Department of Health
 Licensure Regulations and state laws
 Pharmacy
 Boards of Medicine
 Radiation Safety
 Laboratory/CLIA waived testing
- OSHA
- Local ordinances



3

CMS CONDITIONS OF COVERAGE

- Medicare establishes requirements (conditions for coverage) that ASC's must meet in order to be Medicare certified
- Medicare also issues guidelines for state surveyors to use in determining compliance (Interpretive Guidelines for Medicare Regulation: Survey Visits)

4

PROPOSED CHANGES TO CFC

- Proposed only-not finalized
- First major revision since 1982
- New definition prohibits performance of procedures with a planned overnight stay for all patients
- Major expansion of Quality Assessment and Performance Improvement
- New requirements for Patient Rights, including provision of notice prior to delivery of care
- Addition of ongoing Infection Control program under the direction of a designated person with training in IC
- Admission and Pre/Post Surgical Assessment requirements
- Disaster Preparedness Plan

5

National Academy for State Health Policy

The 27 states highlighted in orange and the District of Columbia have adopted adverse event reporting rules and statutes. To access tools and resources developed by these states, along with a brief profile of each state's adverse event reporting system, click on an individual state.
www.nashp.org




6

OSHA
(U.S. Occupational Health and Safety Administration)

- Agency responsible for establishment and enforcement of standards for workplace safety
- Compliance audits can be random or based on complaints
- State agency coordination
- Items to be reviewed during inspections include:
 - OSHA Forms and Logs
 - Written safety policies and procedures/forms
 - Documentation of training
 - Walk through inspection

7

BUSINESS CASE FOR ACCREDITATION



- Required by most payors
- Provides a "seal of approval"
- Sends quality message to consumers
- Accreditation agency relationship with Medicare
- Source of pride for facility staff

8

ACCREDITATION ORGANIZATIONS

AAAH Accreditation Association for Ambulatory Healthcare
www.aaahc.org

The Joint Commission
www.jointcommission.org

AAAASF Association for the Accreditation of Ambulatory Surgery Facilities
www.aaaasf.org

9

ACCREDITATION PROCESS

- Application---5-6 months prior
- Accreditation Fees
- Survey scheduled
- Survey visit
- Accreditation decision and notification

10


PREPARATION FOR THE SURVEY

- Separate standards into functional areas
- Assign to personnel to assess compliance
- Assemble all relevant documents in well-organized format
- Educate staff regarding standards and what to expect
- Attend standards educational conference

11

AREAS INCLUDED IN SURVEY

Patient Charts	Physical Plant
Policies and procedures	Credentialing Files
Credentialing records	Relevant Licenses
Meeting Minutes	Employee Files
Governance documents	Quality and Risk Management
Life Safety issues	Insurance documents
Staff Interviews	Biomedical records
Patient tracer rounds	Patient Satisfaction Data
Controlled substance logs	
Patient Transfers	




12

Accreditation "Opportunities"

- Use of unapproved abbreviations
- Communication and documentation of test results
- Staff competency documentation
- Licensure verification
- Granting of privileges-training documentation, peer recommendation, Board evaluation and approval
- Identification of look-alike and sound-alike drugs and actions to prevent errors
- Medication reconciliation
- Read back of verbal orders/documentation
- Emergency preparedness
- Life Safety code compliance, i.e. emergency lighting
- Proper storage of medications/controlled substance procedures
- Universal Protocol and completion of "Time Out" for all procedures
- Ongoing program for identification and reduction of adverse events and safety risks

13

HEALTHCARE QUALITY INTO THE PUBLIC EYE



- "98,000 Hospital Patients Die Yearly Because of Adverse Events" – (IOM, 1999)
- "Virtually Every Patient Experiences a Gap Between the Best Evidence and the Care They Receive" – (IOM, 2001)
- "A Hospital Patient Can Expect on Average to be Subjected to More than One Medication Error per Day" – (IOM, 2006)

14

CURRENT STATE OF QUALITY

- **Healthcare long treated (and represented) as different from other industries**
 - No performance measurement
 - No outcomes measurement
 - Reimbursement for units of service
- **New Trends in Quality**
 - "Pay-for-Performance" (P4P)
 - Reimbursement for successful outcome or evidence-based process (Medicare)
 - Value Based Insurance Design
 - Demonstrated successful outcomes for inclusion in networks (Private payors);
 - Value Based Purchasing
 - Employers buying outcomes, not just units-of-services, from Preferred Networks

15

TAKE HOME MESSAGE

- Public and private payors increasingly requiring outcomes
- Steering of business to providers with higher quality, better efficiency
- Facilities and systems that outperform will get the business
- Good old days: Volume=Revenue Growth
- Today: Volume of good outcomes=Revenue Growth

16

QUALITY PLAN

- Governing Body responsibility
- Delegation of activity
- Documentation of plan, annual review, and objectives
- Outcomes, process, and structure measures
- Staff and physician involvement in improvements
- Meaningful improvements

17

COMPONENTS OF A QUALITY PLAN

- Purpose/Statement of Objectives
- Responsibilities—Governing Body, physicians, management and staff, committees as applicable
- Organizational structure
- Quality Model utilized if applicable
- Description of Quality measures, including outcomes
- Customer satisfaction
- Credentialing and Peer Review
- Integration with Risk Management and Infection Control
- Reporting structure
- Annual evaluation and revision

18

CMS MEASURES FOR ASC'S

- Mandatory measures for surgery centers anticipated for 2009- now likely to be postponed
- Anticipated Measures include:
 - Wrong sites
 - Hospital Admissions
 - Falls
 - Burns
 - Prophylactic IV Antibiotics Administered on Time

19

ASC QUALITY COLLABORATION

- Formed in 2006 to develop standardized ASC quality measures
- Participation from ASC corporations, associations, professional societies, accrediting bodies, and improvement organizations
- Developed and piloted measures
- Endorsement by National Quality Forum
- Implementation Guide posted on website: ascquality.org



20

CREDENTIALING

Purposes:

- Determines practitioner eligibility for medical staff appointment and clinical privileges
- Foundation for Patient Safety
- Risk Management-surgery center liability
- Fulfill regulatory and accreditation requirements

Key Steps:

- Application
- Verification
- Review and approval by Governing Body

21

VERIFICATION

- Verification process begins after determination that application is complete and applicant meets the organization's membership requirements
- Primary source verifications are received directly from the issuing source in writing, via fax, documented phone call, internet websites
- Elements to be verified include: state licensure and DEA, professional liability coverage, specialty board certification, medical school graduation, internship/residency/fellowship, military credentials, hospital affiliations, National Practitioner Databank, OIG/GSA sanctions, professional references



22

CREDENTIALING RED FLAGS



- Missing dates in training or professional practice
- Discrepancies between information provided on application and verified information
- Interruption of training
- Incorrect hospital staff privileges
- Active staff privileges that become Courtesy or Inactive without explanation
- Disciplinary actions taken by licensure boards or DEA
- Excessive professional liability history
- Cancellation of liability coverage
- Ambiguous references
- Frequent moves

23

CLINICAL PRIVILEGING

- Separate process from medical staff membership
- Joint Commission: Authorization granted by the Governing Body to a practitioner to provide specific patient care services within well-defined limits, based on license, education, training, experience, competence, health status (ability to perform), and judgment
- Qualifications must be clearly defined and documented

24

WHAT MAKES A SUCCESSFUL MANAGER?

Understands both clinical and business office processes-is visible to staff in all areas

Develops staff members and delegates appropriately

Does not compromise patient safety or quality of care-staff understands that as a priority

Possesses sales skills

Continuously looks for ways to improve and makes sure that plans are executed

Constant communicator-lets people know what impact they have on the success of the center

Likes physicians!

25

RESOURCES

- www.osha.gov
- www.cdc.gov/niosh
- www.ascassociation.org/medicarereregulations
- www.nashp.org

26

Case Discussions

Marc Allan Feldman MD MHS

Head, Section of Anesthesia and Director,
Cole Eye Institute Operating Rooms
The Cleveland Clinic Foundation
Cole Eye Institute
Cleveland OH

Workshop Abstracts

Workshop A

(Repeated in Second Session)

Peribulbar Anesthesia

Gary L. Fanning

Former Director of Anesthesiology and Medical Director
Hauser-Ross Eye Institute
Sycamore IL

Orbital regional anesthesia (so-called retrobulbar and peribulbar blocks) have long been used to provide excellent anesthesia and akinesia for surgery of the eye. As there are major complications associated with orbital blocks, more recently other techniques, namely subTenon's anesthesia and topical anesthesia, have been promoted as safer methods of anesthesia, especially for patients undergoing cataract surgery. As not all patients, procedures, and/or surgeons are suited to these newer techniques, orbital blocks will continue to be used in the future. The purpose of this presentation is to examine the anatomy of the orbit vis-à-vis orbital regional anesthesia in order to determine if the safety of the procedure can be enhanced.

For many years a rather standard version of orbital regional anesthesia has been described and taught. In a publication as recent as April 2005 this classic description of an orbital block appears in an excellent paper by Lai et al¹: "A retrobulbar injection was performed by inserting an Atkinson needle through the lower eyelid at the junction of the lateral and middle thirds of the inferior orbital rim parallel to the orbital floor, first to a depth of 25mm, then angled up and medially and advanced toward the apex to the hub of the needle." This classic description includes what I like to call the three cardinal sins of orbital regional anesthesia: 1) the needle is too long, 2) the needle is inserted at the wrong point, and 3) the needle is aimed in the wrong direction. The remainder of this presentation will provide anatomical reasons why I consider these to be cardinal sins and will suggest alternative techniques.

Nomenclature: As I have previously opined², the terms "retrobulbar" and "peribulbar," com-

monly used to describe two different forms of orbital regional anesthesia, are anatomically inadequate. In fact, the term "retrobulbar" simply means behind the eye. Virtually all orbital blocks involve putting a needle behind the eye. The term "peribulbar" means around the eye. All orbital blocks had better be around the eye as the only alternative is through the eye, something we try very hard to avoid. Although meant to describe the anatomical location of the needle tip during the block, neither of these terms is precise enough to be acceptable, in my opinion. When we refer to a "retrobulbar block," we really mean to denote a block in which the needle tip lies within the muscle cone. It would be preferable, therefore, to simply call it an "intraconal block." Likewise, the term "peribulbar block" is meant to denote a block in which the needle tip is outside of the muscle cone. Again, it makes more sense to call it an "extraconal block." Both forms of blocking are acceptable as local anesthetic can easily diffuse from one compartment to the other, as demonstrated well by Ripart et al³.

Needle Length: The standard Atkinson needle is 1 1/8" (38mm) in length (even though Atkinson⁴ described using a 1 3/8" (35mm) needle). It is too long. In 1989 Katsev et al⁵ published a study of the orbital length of 120 skulls. In that study, 20% of the orbits were short enough that a 1 1/8" needle would be able to reach within 7mm of the optic canal. In that area of the orbit, structures are packed tightly together and are vulnerable to damage by a needle. Katsev et al recommended that needles 1 1/8" (31mm) or less be used in order to avoid harm in patients with short orbital lengths. This author has used a 1 1/8" needle to perform a shallow, intraconal block quite successfully for about five years in all patients. Prior to that a 1 1/8" was used. I prefer a 27G needle, but this needle is no longer available in 1 1/8" length. I have been using a 25G needle in its place. There is no need to use a larger diameter needle. The block results have been as good or better with the 1 1/8" needle. In the first 8 months of 2008 I worked in an institution where we used 25 G 7/8" needles. I got good blocks, but on average had to use a little volume to do so. I also saw a bit more chemosis, which did not interfere with surgery and which was pretty well controlled after a few minutes of ocular pressure with a Honan balloon. There is no need to use a long needle, and by using a shorter needle several of

the severe complications of orbital blocks will be less likely to occur, including significant retrobulbar hemorrhage, intravascular injection, brainstem anesthesia, and optic nerve injury. By staying out of the deep orbit, one also stays away from the large bellies of the extraocular muscles that are found back there, thus making direct intramuscular injection less likely. Avoiding the deep portion of the orbit, as recommended by Katsev et al, makes anatomical sense and does not adversely affect the quality of the block.

A final word on needles: the needle is an important tool in performing an orbital block. It is incumbent on each of us to know the exact length, gauge, and tip-type of the needles we use to perform blocks and to record it in the patient's record when doing a block.

Needle Insertion Point: When looking face-on at the orbit, we have several choices of points to insert a needle. The inferonasal quadrant is not a good point for insertion because the origin of the inferior oblique muscle lies there. The superonasal quadrant is not a good point, either, because many important and easily damaged structures are there, including the superior oblique muscle and the trochlear mechanism, the end branches of the ophthalmic artery, the beginning of the superior ophthalmic vein, and the end branches of the nasociliary nerve. The superotemporal quadrant is relatively devoid of structures except for the lacrimal gland, and several authors have advocated insertion of needles in this area to supplement blocks. I use it occasional, especially if only the superior rectus and levator are still active after an inferotemporal injection. The inferotemporal quadrant is the area most devoid of structures and is most frequently used in performing blocks. Through the years it has been most common to instruct people to insert the needle at the junction of the lateral one-third and medial two-thirds of the inferior orbital rim. When looking at the frontal anatomy of the orbit, you will immediately see that at this point one can easily encounter the inferior rectus muscle or the neurovascular bundle of the inferior oblique muscle. Both muscles are among the most commonly involved in prolonged dysfunction following an orbital block. Atkinson⁴ is often credited with suggesting this entry point for an orbital block. In his paper, Atkinson actually states: "...an intradermal wheal is first raised a short distance below the

inferior temporal margin of the orbit... The 3.5 cm needle is then introduced through the wheal...so that the point just clears the inferior orbital margin." Nowhere in this paper does he suggest the junction of the lateral one-third and medial two-thirds. Unfortunately, one of the illustrations in this paper shows a needle entering at that point instead of at the inferior temporal corner of the orbit, as he stated. In fact, the inferior temporal margin or corner of the orbit is anatomically an excellent place to insert a needle. Behind this point is a compartment of fat that leads directly to the intraconal adipose tissue compartment. By inserting the needle at this point, one has the best chance of entering the gap between the lateral and inferior rectus muscles, thus sparing them from direct needle damage and/or intramuscular injection. In my opinion, based on the anatomy of the orbit and on my own experience and that of others (R. Husted, MD and R. Hamilton, MB, BCh), the classic entry point should be abandoned in favor of an entry point near the extreme inferotemporal corner of the orbit.

A special statement needs to be made regarding the upper half of the orbit. When you closely examine the anatomy of the orbit, you will note that the major and largest vascular structures (ophthalmic artery and superior ophthalmic vein) lie in the upper half of the orbit. Deep in the orbit these vascular structures become very large indeed. Thus, in order to avoid the vascular complications of orbital regional anesthesia (retrobulbar hemorrhage and intravascular injection), one should avoid the upper half of the orbit as well as the deep orbit.

A second entry point needs to be mentioned due to the necessity of occasionally supplementing blocks in order to achieve complete akinesia. Medial to the medial rectus muscle there lies an adipose tissue compartment (the medial canthal compartment) separating the muscle from the medial wall of the orbit. This space can be easily entered, as will be described in greater detail subsequently. This is a very useful space for injecting local anesthetic to supplement a block, but some individuals use it successfully as the primary compartment of injection. It is particularly useful if the patient is known to have a long eye with an inferolateral staphyloma.

Needle Direction: After the needle has been

inserted at the inferotemporal corner of the orbit, how does one direct it? As suggested earlier in the reference by Lai et al¹, many people direct the needle toward the apex of the orbit. In fact, this is a dangerous direction because of all the structures packed together at the apex heading toward and coming from the optic canal and annulus of Zinn. Behind the eye there is an intraconal fat pad which extends outward into the extraconal area. Local anesthetic spreads easily throughout the orbit when injected into this fat so long as sufficient volume is used. It is neither necessary to aim toward the apex nor to have the needle tip deep in the orbit.

One begins by envisioning a line connecting the superonasal and inferotemporal corners of the orbit. The needle is inserted on this line at the inferotemporal corner of the orbit and aligned with it. With the patient's eye in neutral gaze, a sagittal plane is envisioned passing through the lateral limbus. The one-inch needle is then angled in such a way that the tip will pass tangential to the globe and just touch that limbal plane when it reaches the intraconal fat-filled space about 5mm behind the hind surface of the eye. The angle that one must use to attain this end point is determined by two factors that are different in every patient: the axial length of the eye and the degree to which the eye is either proptotic or deeply set. If the eye is deeply set and/or long, the angle of insertion will be considerably steeper than when the eye is short and/or proptotic. Aiming the needle in this way makes it very unlikely that one will damage the optic nerve, the major vessels, or the extraocular muscles.

[A technical note: I begin the block with the patient's eye in neutral gaze. I insert the needle with the bevel facing the globe. When the needle tip is beyond the equator (frontal plane) of the globe, I rotate the needle 180° so that the bevel is now facing the lateral orbital wall. Rotating the needle helps bring the tip behind the eye without having to otherwise redirect the needle. **I make no purposeful attempt to redirect the needle once I have determined the proper angle of insertion other than to rotate the bevel.**]

The length of the patient's eye is an important factor to keep in mind when performing orbital blocks. Many authors have stressed the rela-

tionship of axial length and the incidence of globe penetration or perforation. Edge and Navon⁶ described 7 cases of perforation in 50,000 blocks. In each case the eye was greater than 27mm in axial length and each had a staphyloma. For every case of cataract surgery, the axial length has been measured. The axial length in these cases should be recorded with the block technique. If the axial length is unknown, as in cases other than cataract surgery, one should at least attempt to find and record the patient's spherical equivalent. High myopes (those with spherical equivalents of -4.00 or less) are very likely to have long axial lengths. In the absence of both axial length and spherical equivalent, one should try to determine and record whether or not the patient is a high myope by history (requiring glasses at an early age in school in order to see distant objects).

The globe-orbit relationship is also important. Is this a long eye deeply set in a tight orbit or a short, proptotic eye in a very loose orbit? Not only is it wise to examine this relationship in every patient, it is very prudent to record it with the axial length or spherical equivalent in the space in the patient's record where the block is recorded.

Supplementing Blocks: When using a short needle to perform a shallow intraconal block, it is necessary to inject 4-8mL or more in order to get a good block. I routinely use 8-10mL using a 7/8" needle unless the globe is beginning to become tight within the orbit as I inject. I also have my assisting nurse place her fingers gently along the inferior orbital rim to bolster the orbital septum in that area. It is possible to use your own fingers to do this in the absence of an assistant. Doing this helps to promote the flow of anesthetic upwards and backwards instead of into the lower lid. The incidence of greater than 95% akinesia should be greater than 90% after one injection. Due to the vagaries of the orbital connective tissue system, sometimes the medial and/or superior compartments are less well covered with local anesthetic. There are two alternatives: repeat the inferotemporal block or perform a medial canthal block. To perform a medial canthal block, one inserts a 1" needle into the little tunnel that lies posterior to the medial canthus and anterior to the caruncle, aiming toward the medial wall of the orbit.

Upon just touching the medial wall, the needle is withdrawn about 1-2mm and redirected to be inserted into the orbit parallel to both the orbital wall and orbital floor. The needle must not be inserted aggressively, because the optic canal lies directly at the posterior aspect of the medial orbital wall. Never use a needle longer than one inch in this area, and do not let the shoulder of the needle (where shaft and hub meet) go deeper than the plane of the iris. About 4mL injected here usually provides a perfect supplement to the block, although more or less may be required, depending on the patient. It is wise to wait at least five minutes after the inferotemporal injection before doing this supplemental injection. Other techniques have been described for blocking in this area^{7,8}, but the technique described by Husted et al⁹ has been very safe and effective in my hands.

Summary: It is unnecessary to use long needles to perform orbital regional anesthesia and doing so may increase the hazards of the procedure. Inserting the needle at the junction of the lateral one-third and medial two-thirds of the inferior orbital rim is not anatomically defensible, because it endangers the inferior rectus muscle and the neurovascular bundle to the inferior oblique. A more anatomically desirable insertion point is near the extreme inferotemporal corner of the orbit. The needle should not be aimed at the apex of the orbit. By aiming a short needle to just intercept a plane going through the lateral limbus, one can avoid many of the most severe complications of orbital regional anesthesia.

References:

1. Lai MM, Lai JC, Lee W-H, et al. Comparison of retrobulbar and sub-Tenon's capsule injection of local anesthetic in vitreoretinal surgery. *Ophthalmology* 2005; 112:574-579.
2. Fanning G. Orbital regional anesthesia: let's be precise. *J Cataract Refract Surg* 2003; 29:1846-1847.
3. Ripart J, Lefrant J, de la Coussaye J, et al. Peribulbar versus retrobulbar anesthesia for ophthalmic surgery. *Anesthesiology* 2001; 94:56-62.
4. Atkinson WS. Retrobulbar injection of anesthetic within the muscle cone. *Arch Ophthalmol* 1936; 16:494-503.
5. Katsev DA, Drews RC, Rose BT. An anatomical study of retrobulbar needle path length. *Ophthalmology*. 1989; 96:1221-1224.
6. Edge R, Navon S. Scleral perforation during retrobulbar and peribulbar anesthesia: risk factors and outcome in 50,000 consecutive injections. *J Cataract Refract Surg* 1999; 25:1237-1244.
7. Ripart J, Lefrant J, Vivien B, et al. Ophthalmic regional anesthesia: medial canthus episcleral (sub-Tenon) anesthesia is more efficient than peribulbar anesthesia: a double-blind randomized study. *Anesthesiology* 2000; 92:1278-1285.
8. Nouvellon E, L'Hermite J, Chaumeron A, et al. Ophthalmic regional anesthesia: Medial canthus episcleral (sub-Tenon) single injection block. *Anesthesiology* 2004; 100:370-374.
9. Husted RF, Hamilton RC, Loken RG: Periocular local anesthesia: Medial orbital as an alternative to superior nasal injection. *J Cataract Refract Surg* 1994; 20:197-201.

General References:

- Dutton JJ. *Atlas of Clinical and Surgical Orbital Anatomy*. WB Saunders Company, Philadelphia, 1994.
- Gills JP, Husted RF, Sanders DR, eds. *Ophthalmic Anesthesia*. Slack, Inc., Thorofare, New Jersey, 1993.
- Kumar C, Dodds C, Fanning G, eds. *Ophthalmic Anaesthesia*. Swets & Zeitlinger, Lisse, The Netherlands, 2002.

Workshop B

(Repeated in Second Session)

SubTenon's Wet Lab

Steven Gayer MD MBA et al.

Associate Professor of Anesthesiology & Ophthalmology
Bascom Palmer Eye Institute
University of Miami
Miller School of Medicine
Miami FL

Demonstrate techniques for administering anesthetic solutions utilizing pig eyes and hands-on practice

Workshop C

(Repeated in Second Session)

Complications of Anesthesia Administered for Ophthalmic Surgery

Gary D. Cass MD

Tampa Eye and Specialty Surgery Center
Tampa FL

Invasive clinical procedures all have inherent complications. The key to patient safety is the recognition and appropriate treatment of these complications.

The workshop on Complications of Ocular Anesthesia will focus on topical and conduction anesthetics, including retro and peribulbar and sub-Tenon's technique. Cases of anesthetic complications will be presented and the participants will be encouraged to help recognize and suggest appropriate management.

Cases to be discussed will range from common minor events to more serious ones. Included will be wrong site injection, chemosis after injection, peribulbar bleeding, brainstem anesthesia, intra-ocular and intra-arterial injection and more if time allows.

Come to the workshop and expect to participate.

Joseph Bayes MD

Date _____

MEEI INFORMATION REQUIRED FROM CARDIOLOGIST REGARDING PATIENTS WITH PACEMAKERS & ICDs:

This form MUST be filled out and returned ASAP or your patient's upcoming surgery may be cancelled.

Pacemaker Clinic _____ Phone _____ Fax _____
Cardiologist _____ Phone _____ Fax _____
Surgeon _____ Phone _____

Dear Doctor:

Your patient:

Patients' Name _____

Date of Birth _____

is coming to the Massachusetts Eye and Ear Infirmary on (Date) _____ to have the following type of surgery _____

Paragraph below to be completed by patient's Cardiologist or Pacemaker Clinic

To best care for the patient, and reduce the risk of delays or cancellation, please provide us with the following information as soon as possible.

1. Type of implanted device (e.g. Pacemaker/ICD) _____
2. Manufacturer _____
3. Model # _____
4. Most recent insertion date of generator _____
5. Reason for insertion _____
6. Date and result of most recent interrogation including adequacy of battery life. _____
7. How device will respond to magnet placement and removal (if necessary) _____
8. Recommendations for perioperative management of device for proposed procedure. (E.g. No special precautions? Magnet inactivation? Postoperative interrogation of device before discharge?) _____
9. Name and telephone number of contact cardiologist if additional information is needed. _____
10. Other information _____

Please fax completed form (or information contained within) to Ms. Gail Langone c/o Preop Review MEEI 617 523 7942, or mail to Preop Review 8th Floor, MEEI, 243 Charles Street, Boston, MA 02114

Meeipacericdinforequest4.06jb