

Prevention of Postoperative Visual Loss

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Abstract

Anesthesia providers have the responsibility of providing safe and competent care to patients that entrust them with their lives. It is expected that all potential hazards be minimized during that time. Such expectation can be met utilizing a plethora of current research evidence available at the disposal of every provider. After conducting a thorough literature review on the incidence of Postoperative Visual Loss (POVL), it is understood that though rare, such a complication can be devastating as it can result in permanent injuries to the victim's visual system. The knowledge base of a convenience sample size of 39 Student Registered Nurse Anesthetists (SRNAs) at Adventist University of Health Sciences (ADU) on preventative measures of POVL was assessed. The intent of this capstone is to educate the current SRNAs at Adventist University of Health Sciences (ADU) regarding POVL. The ultimate goal is to increase vigilance among current ADU SRNAs when caring for those susceptible to developing POVL, which may subsequently decrease its incidence. A simple t-test difference was conducted. It determined the correlation between the pre and post-tests. The results suggested a significant increase in the knowledge base amongst the SRNAs following a thorough PowerPoint presentation. Education via a POVL PowerPoint presentation is a great positive tool to assess ways in which SRNAs stay informed on current evidence based anesthesia care. The results of the presentation demonstrated an increase in posttest scores and therefore a better understanding of POVL among the sample chosen.

Problem

Whether a direct result of the procedure itself or the anesthesia provided, many surgical interventions come with some level of risk. According to Dickemper and Griffin (2010), it is estimated on a yearly basis around 26 million Americans undergo procedures or some form of treatment that necessitates anesthesia services. The authors stated that many strides have been made in the surgical and anesthetic practices such as evidence-based research, higher education, and more advanced equipment. Progression in these areas has led to drastic decreases in the percentage of serious perioperative and postoperative complications. However, damaging outcomes still occur despite such huge improvements in both surgical and anesthetic practices.

Grover and Jangra (2012) stated that postoperative vision loss (POVL) is an uncommon, unpredicted and catastrophic complication that is most often associated with various surgeries. It is an injury to one or both eyes that may include permanent damage to a patient's visual system or total blindness. Its occurrence is only approximately 0.05% in all nonophthalmic surgeries. Surgeries of the spinal, cardiac, head, and neck origins are often the most common causes of POVL. The occurrence of POVL is found more often in spine surgeries (0.2%) as compared to other surgeries. Although the exact cause of POVL has not been established; however, ischemic optic neuropathy (ION), central retinal artery occlusion (CRAO), cortical blindness, and external ocular injury have been ascribed to the cause. Furthermore, according to Nagelhout and Plaus (2014) ION and CRAO account for 81% of all POVL cases with ION being responsible for 89% of POVL from spinal surgeries. Grover and Jangra (2012) also stated micro-vascular diseases and the compromise of patients' hemodynamics in the perioperative period are other notable causes that have been linked to the contribution of POVL. The authors believe that the prevention of POVL can be complex due to the level of ambiguity that exists regarding its origin.

Therefore, the implementation of an interdisciplinary team approach should be executed in order to avoid this complication.

Shen, Drum, and Roth (2009) evaluated the prevalence of POVL in orthopedic, spinal, cardiac, and general surgery, with a sample of more than 5.6 million patients obtained from the National Inpatient Sample (NIS). This was a retrospective study that spanned over 10 years of data. Assessment of potential risk factors was accomplished utilizing the univariate and multivariate analyses. From 1996 to 2005, these patients underwent surgical procedures ranging from knee arthroplasty, spinal fusion, laminectomy without fusion, appendectomy, colorectal resection, cholecystectomy, coronary artery bypass grafting hip/femur surgery, and cardiac valve. The definition used for the rates of POVL were any discharges resulting in an International Classification of Diseases, Ninth Revision, Clinical Modification code of ischemic optic neuropathy (ION), cortical blindness (CB), or retinal vascular occlusion (RVO).

Surgeries involving cardiac and spinal fusion, POVL was among the highest with the national estimate of 8.64/10,000 and 3.09/10,000 respectively. Patients under the age of 18 had the highest risk for POVL, because of the higher probability of cortical blindness. Patients older than 50 years were found to be at greater risk for developing ischemic optic neuropathy and retinal vascular occlusion. Other significant risk factors for developing POVL included male gender, Charlson comorbidity index, anemia, and blood transfusion (Shen, Drum & Roth, 2009).

In an article written by Pierce & Kendrick (2010), the authors stated that ischemic optic neuropathy (ION) is the primary cause of POVL in all surgical procedures except those involving the eyes. This phenomenon prompted the authors to state that POVL is directly related to increased IOP and hypoperfusion. Furthermore, comorbidities such as diabetes, smoking,

anemia, blood loss, vasopressors, atherosclerosis, and heart disease are all risk factors that increase the incidence of POVL (Pierce & Kendrick, 2010).

After conducting a preliminary literature review of the incidence of POVL, it is evident that it is a rare complication that patients may experience. However, its consequences are very detrimental to the individual affected and all healthcare providers involved. Therefore, the intent of this capstone is to educate the current SRNAs at Adventist University of Health Sciences (ADU) regarding POVL. The ultimate goal is to increase vigilance among current ADU SRNAs when caring for those susceptible to developing POVL, which may subsequently decrease its incidence.

Literature Review

Pierce and Kendrick (2010) wrote an article claiming that ION is the likely cause of POVL. The authors argued that depending on the condition of the optic disc, ION can be classified either as anterior ischemic optic neuropathy (AION) or posterior ischemic optic neuropathy (PION). In either case, an ophthalmologic consultation is the most appropriate and safest for the patient. Some of the treatments that have may be initiated by the ophthalmologist are retrobulbar steroid injections, antiplatelet therapy, anticoagulants, phenytoin, norepinephrine, and blood replacement. The authors further noted that preventing POVL can be accomplished if the anesthesia provider is aware of the patient's optic nerve circulation preoperatively and able to effectively monitor IOP intraoperatively. However, since those situations are not always feasible, for patients with known comorbidities such as cardiovascular diseases, visual disorders, and hypertension, maintaining the blood pressure near the baseline is practical. Other preventive measures offered by the authors are to counsel the patient on smoking cessation before surgery,

document any visual disturbances prior to the procedure, avoid applying any direct pressure to the eye, and cater the anesthetic plan to the patient with known glaucoma.

Using the design of a single-center, prospective randomized controlled study, Carey, Shaw, Weber, and DeVine (2014) conducted research with the purpose of assessing the effect of table inclination on IOP in patients undergoing prone spine surgery. The setting of the study was Dwight D. Eisenhower Army Medical Center. A total of 19 patients without eye pathology history who were undergoing prone spine procedures were randomly assigned to tables that were in the reverse Trendelenburg position at 5 or 10 degrees. A thorough assessment of ophthalmic complication, estimated blood loss, intraocular pressure (IOP), mean arterial pressure (MAP), and fluid resuscitation were completed. These assessments were performed before and after induction and at 30 and 60 minutes, and 60 minutes thereafter. These outcomes were measured using the multivariate analysis. Before revealing the results, it was important that the authors first discussed the length of the surgeries ranging from 33 to 325 minutes. The study concluded that a 10-degree reverse Trendelenburg yields lower IOP as compared with prone positioning in surgical procedures lasting less than 120 minutes. The study also stated that the higher the degree of reverse Trendelenburg, the lower the rise of IOP.

Molloy (2012) stated that surgical procedures that involve patients being in steep Trendelenburg positions have increased the need to monitor intraocular pressure (IOP) due to the number of reported POVL. Eyelid edema, chemosis, and ecchymosis were among the findings in the 17 patients that sparked the author's interests in conducting the study. The author's aim for conducting the study was to connect IOP tonometry measurement to an observation scale, which enables anesthesia providers to determine when to initiate treatments that optimize ocular perfusion.

In study referenced above the author was able to obtain a sample size of 111 patients undergoing procedures in the steep Trendelenburg position at a medical center in New England. Those with histories of eye diseases or eye surgeries were excluded from the study. Those chosen were patients undergoing procedures lasting 120 minutes such as bowel resections, laparoscopic prostatectomy, and pelvic gynecologic surgeries. The author used a prospective repeated-measures correlation regression model as the design of the study. Molloy (2012) determined that an IOP of 40 mmHg is considered to be a critical threshold. The author suggested using the Molloy/Bridgeport Anesthesia Associate Scale, which is a visual assessment that evaluates the presence of eyelid edema, ecchymosis or chemosis and a baseline IOP values obtained using a tonometer to determine the likelihood of patients reaching an IOP of 40 mmHg.

The author concluded that having a baseline IOP allows the early detection of critical values by the anesthesia provider. Understanding that this is not common practice, the author strongly felt that practice be changed due to the increasing in procedures requiring patients to be in steep Trendelenburg positions which increase the incidence of POVL, especially in those with histories of glaucoma, diabetes, or advanced vascular disease. Also, the author concluded that the observation of chemosis has proven to correlate 3.4 times greater than the baseline and therefore can be substituted for it. Further suggestions made by the author were a 5-minute supine rest or reverse Trendelenburg during steep Trendelenburg, sitting and prone positions can significantly decrease IOP hence improving ocular perfusion pressure (OPP).

Inspired by the findings of the preceding study discussed, Cong & Molloy (2014) sought to develop an intervention plan to reverse ION that often results from an increase IOP related to patient positioning in certain procedures. The authors' quests to find such resolution came about after determining that auto-regulation cease in most individuals once the IOP reaches 40-45

mmHg. The intervention tested by the authors was the administration of a drop of Cosopt; a combination of dorzolamide hydrochloride and timolol maleate solution administered in each eye of patients having robotic urologic and gynecologic procedures lasting 120 minutes or longer in the steep Trendelenburg position.

Cong & Molloy (2014) conducted the study using a quasi-experimental design at 3 different medical centers in Northeastern United States. Sixty-three of the 164 recruited patients received the Cosopt treatment when their IOP reached 38-40 mmHg. The participants' IOP were measured at 30-minute intervals during the procedure. Those whose IOP remained below 40 mmHg did not receive the treatment. The authors used instruments and measures such as a tonometer, patients' demographics, and mean arterial pressures (MAP). Qualified providers who were properly trained to use the mentioned tools collected the data. Furthermore, all participants received a standard anesthetic, which included versed, fentanyl, Propofol, rocuronium or vecuronium, sevoflurane or Desflurane with 100% oxygen. It is also worth mentioning that insufflation pressures were kept between 14-15 mm Hg and end tidal carbon dioxide ranged between 30-39 mm Hg.

After analyzing the data collected from the 3 medical centers, Cong & Molloy (2014) concluded that Cosopt drastically decreased IOP from critical threshold to safe levels during the procedure. However, the IOP continued to increase throughout the procedure in the group that did not necessitate the Cosopt treatment. As a result, the authors suggested that subsequent doses of Cosopt be administered in the event that the IOP level began to rise again in the treatment group since it may be safely repeated. Also, the authors stated that both the Molloy/Bridgeport Anesthesia Associates Observation Scale and a tonometer can be used to assess the IOP level.

The American Society of Anesthesiologists (ASA) conducted a study on the risk factors associated with ischemic optic neuropathy (ION) after spinal fusion surgery (ASA, 2011). A multi-institutional case control study design was used in which the authors compared 80 adult patients with ION and 317 adult patients without ION. This sample was obtained from the ASA POVl registry containing patients with past spinal fusion surgery from 17 centers. Using a multivariate statistical analysis, the following results were obtained: risk factors after spinal fusion surgery included male sex with a $P=0.005$, obesity with a $P=0.001$, Wilson frame use with $P=0.001$, anesthesia duration with a $P<0.001$, estimated blood loss with a $P=0.001$, and colloid as percent of non-blood replacement with a $P<0.001$ (ASA, 2011).

Essentially, this study was the first of its kind and these were the independent variables found to be of significance in ION in spine surgeries. The study concluded that preventive strategies are the only sure ways of reducing the occurrences of POVl. The two populations identified at highest risk are the obese and males. Furthermore, minimizing factors such as time under anesthesia, estimated blood loss (EBL), and use of a combination of crystalloid and colloid when possible all decrease the likelihood of ION development hence preventing POVl (ASA, 2011).

Over the past several decades, the incidence of POVl has been rising in spinal procedures done under general endotracheal anesthesia in the prone position. Eager to shed light and to assess such detrimental and costly complication, the ASA has developed a POVl registry. As a result, a closed claims POVl project was birthed. Its goal was to identify and isolate patterns of injury and to develop strategic prevention methods. The ASA's hope was that these interventions would ultimately increase patient safety. To prevent POVl, the author stated for the prone spine cases, the ASA recommends that a foam headrest be used, mirror be placed

under the patient's face for visualization and assessment of the eyes, to avoid direct pressure to the eyes, to documentation of eye checks every 20 minutes, and avoid goggle use. Also, for the patient that is at higher risks for POVL, it is advisable to discuss such risk during the pre-anesthesia assessment, assess patient immediately after the procedure, maintain the head at the level of the heart or higher if possible, optimize both the hematocrit and hemodynamics, and if allowed by the surgeon, the procedure should be staged (Grover & Jangra, 2012).

Project Description

Submission to the Adventist University (ADU) Scientific Review Committee (SRC) and Institutional Review Board (IRB) was performed and approved. This Capstone project comprised of a thorough review of current literature focused on the prevention of postoperative vision loss POVL. A comprehensive 40-minute PowerPoint module (Appendix C) was created which serves as an education tool for current and future SRNAs. The PowerPoint module included headings such as objectives, case study, problem, background information, and thorough review of the current literature of the prevention of POVL. The ADU nurse anesthesia senior class of 2016 and junior class of 2017 were presented with this learning module. A pre-lecture test was completed by both classes before the teaching module to establish baseline knowledge of postoperative vision loss. The posttest was administered to evaluate the effectiveness of the PowerPoint presentation once the learning module content was concluded and all questions answered. Those tests were given over 10-minute period respectively.

Evaluation Plan

To evaluate the outcomes for this project, a thorough assessment of the pre and post module tests were conducted. A sample size comprised of 39 junior and senior SRNAs were selected for the evaluation. The two scores were compared and analyzed to evaluate if the

SRNAs have gained a better understanding of POVl after the PowerPoint presentation. Prior to starting the study, informed consent were obtained from the SRNAs, which addressed the purpose of the project, participation involvement, the risk and benefits associated with their involvement, the efforts that would be made in order to protect their confidentiality, and finally ways that they would be compensated for their participation. Participants had their privacy protected with anonymous data collection using a numbering system. No person information was obtained.

The main investigators of this project graded each test and transcribed the obtained results into a Microsoft Excel Spreadsheet. The results were submitted to Dr. Roy Lukman, a statistician at ADU. With his expertise in data analysis, Dr. Lukman conducted a simple t-test difference, which determined the correlation between the pre and post-tests. This ultimately served as the tool for the evaluation of the lecture.

Results and Conclusion

The pre and post-tests results are explained below. These were obtained with the assistance of Dr. Roy Lukman, the Chair of the Scientific Review Committee (SRC).

As you can observe from the first table, the average scores increase from 36.1538 to 87.1795 with a smaller standard deviation on the Posttest, indicating a smaller variance among the scores. The obtained t value is -12.852 with an associated p that is less than .05 level of confidence. Statistical significance has been achieved. The negative t value also indicated that there was an improvement of the average score after the intervention.

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 <u>PreTest %</u>	36.1538	39	26.21926	4.19844
<u>PostTest %</u>	87.1795	39	10.50031	1.68139

Paired Samples Test

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Difference				
					Lower				Upper
Pair 1	PreTest % - PostTest %	-51.02564	24.79334	3.97011	-59.06271	-42.98857	-12.852	38	.000

The data analysis demonstrated that there was a significant increase from the pre and post-test evaluations. Therefore, it can be inferred that the method of teaching, which was a PowerPoint presentation presented between the pre and post-tests, was a great tool to educate the current SRNAs at ADU on the prevention of POVL. This presentation of the capstone project was very effective at raising awareness among the SRNAs on the incidence of POVL. Furthermore, it will influence their practice by guiding their decisions on ways to prevent POVL.

To conclude, the incidence of POVL is rare and mainly found in a certain patient population, surgical procedures, and positions. Despite the many strides that have been made in medicine to minimize direct unwanted potential injuries to patient due to surgery or anesthesia, the prevention of POVL remains a challenge. This is partly because the exact cause of POVL is not yet established. Its occurrence can be detrimental to patients; therefore, it should be the duty of every anesthesia provider to seek guidance in ways to prevent it. The intent of this capstone project was to serve as an epitome for anyone who is looking to enhance his or her knowledge base on ways to prevent POVL in surgical patients.

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749330337?accountid=35793

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<http://dx.doi.org/10.1213/ane.0b13e3181b0500b>

Appendix A

Pre and Post Tests Questions

1. What are the most common surgeries associated with the highest risk for POVL?
 - a. Cardiac Surgery
 - b. Spinal Fusion Surgery
 - c. Orthopedic Surgery
 - d. Cataract surgery
2. What are the most common positions placing the patient at risk for POVL?
 - a. Prone
 - b. Beach-Chair
 - c. Lithotomy
 - d. Lateral Decubitus
 - e. Reverse Trendelenburg
3. T/F: When suspecting POVL as a complication to surgery, it is best to refer the patient to an Ophthalmologist.
4. What are ways to prevent POVL?
 - a. Limit pressure on the eyes
 - b. Pad pressure points in the prone position
 - c. Maintain an acceptable MAP
 - d. Maintain Hct
 - e. d of 20
5. Which position yields lower IOP in surgical procedures lasting less than 120 minutes?
 - a. Reverse Trendelenburg
 - b. Prone
6. T/F: Females are more likely than males to develop POVL?
7. The exact cause of POVL is?
 - a. Low Hct
 - b. Suboptimal intraoperative Mean Arterial Pressure
 - c. Not well documented
 - d. Continual direct eye pressure
8. What are the most common cause/s of POVL?
 - a. Ischemic optic neuropathy
 - b. Central or branch retinal artery occlusion
 - c. Cortical blindness
 - d. External ocular injury
 - e. All the above

9. What accounts for 89% of POVL after prone spinal cases?
 - a. Central retinal artery occlusion
 - b. Ischemic optic neuropathy
 - c. Central retinal vein occlusion
 - d. Cortical blindness

10. What are patient factors associated with Ischemic optic neuropathy?
 - a. Male
 - b. HTN
 - c. Diabetes
 - d. Obesity
 - e. All the above

Appendix B

ADU NAP CAPSTONE PROJECT – INFORMED CONSENT

Our names are Tim Marble and Felix Camille, and we are MSNA students in the Nurse Anesthesia Program (NAP) at Adventist University of Health Sciences (ADU). We are doing a Capstone Project called *Prevention of Postoperative Vision Loss*. This project is being supervised by Dr. Steven Fowler. We would like to invite you to participate in this project. The main purpose of this form is to provide information about the project so you can make a decision about whether you want to participate.

WHAT IS THE PROJECT ABOUT?

The purpose of this project is to bring awareness and educate the 2016 and 2017 Student Registered Nurse Anesthetists of ADU on ways to prevent the occurrences of Postoperative Vision Loss (POVL).

WHAT DOES PARTICIPATION IN THIS PROJECT INVOLVE?

If you decide to participate in this project, you will be asked to complete an anonymous pre-assessment, attend a classroom presentation, and then complete an anonymous post-assessment. The assessment will address the prevalence of POVL, its causes, and ways to prevent it. Your participation by attendance at the presentation and completion of the survey is anticipated to take approximately 10 minutes.

WHY ARE YOU BEING ASKED TO PARTICIPATE?

You have been invited to participate as part of a convenience sample of students currently enrolled in the ADU NAP. Participation in this project is voluntary. If you choose not to participate or to withdraw from the project, you may do so at any time.

WHAT ARE THE RISKS INVOLVED IN THIS PROJECT?

Although no project is completely risk-free, we don't anticipate that you will be harmed or distressed by participating in this project.

ARE THERE ANY BENEFITS TO PARTICIPATION?

We don't expect any direct benefits to you from participation in this project. The possible indirect benefit of participation in the project is the opportunity to gain additional knowledge about ways to prevent POVL.

HOW WILL THE INVESTIGATORS PROTECT PARTICIPANTS' CONFIDENTIALITY?

The results of the project will be published, but your name or identity will not be revealed. To maintain confidentiality of assessments, the investigators will conduct this project in such a way to ensure that information is submitted without participants' identification. This will be achieved by using a numbering/coding system. Thus, the investigators will not have access to any participants' identities.

WILL IT COST ANYTHING OR WILL I GET PAID TO PARTICIPATE IN THE PROJECT?

Your participation will cost approximately 60 minutes of your time, but will require no monetary cost on your part. You will not be paid to participate.

VOLUNTARY CONSENT

By signing this form, you are saying that you have read this form, you understand the risks and benefits of this project, and you know what you are being asked to do. The investigators will be happy to answer any questions you have about the project. If you have any questions, please feel free to contact Tim Marble (timothy.marble@my.adu.edu) & Felix Camille (felix.camille@my.adu.edu). If you have concerns about the project process or the investigators, please contact the Nurse Anesthesia Program at (407) 303-9331.

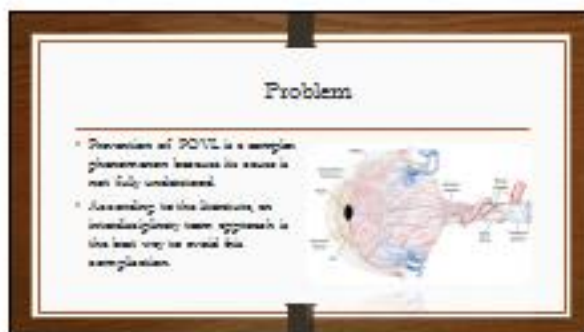
Participant Signature

Date

Participant Name (PRINTED LEGIBLY)

Appendix C

ADU NAP CAPSTONE PROJECT – POWERPOINT PRESENTATION



What is the Exact cause?

- Not well Documented
- However, associated with:
 - Ischemic optic neuropathy (ION)
 - Greater anterior eye surgery
 - Greater posterior eye surgery
 - Central retinal artery occlusion (CRAO)
 - Central vein thrombosis
 - Central retinal artery

ION & CRAO accounts for 8% of all cases

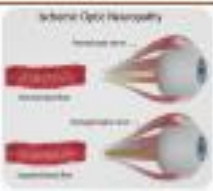
'Doc, Part of My Vision is Gone!'

ION vs. CRAO

	Ischemic Optic Neuropathy (ION)	Central Retinal Artery Occlusion (CRAO)
Etiology	Surgery & HF Prolonged surgery + Blood loss + Crystalloid infusion	Block external pressure Emboli
Mechanism	Ischemia Delayed release + stretch and compression of life	+ Ocular perfusion pressure
Clinical Features	Flashes Blurred + Night perception + Visual fields	Flashes Unilateral Parvocortical swelling or atrophy

Ischemic Optic Neuropathy

- Ischemia to portion of the optic nerve
- ION accounts for 8% of POVL after spine surgery
- Most common cause of ION
 - Decreased ocular perfusion pressure (OPP) & increased IOP
 - 40% - 1st - 40%



Associated surgeries

- POVL incidence in all surgeries 0.5% - 10%
- Most Common:
 - Spine surgery: 10% - 15% after spine surgery
- Other:
 - Cataract
 - Tumor
 - Glaucoma
 - Strabismus



Risk Factors

Operative	Postoperative
Adhesiolysis	Hypotension: 40% - 100% during
Dissection	Anemia
Clipping	Decrease blood flow
Stable eye	Long duration of surgery
Hypotension	Head dependent positioning
Unusual anatomy of the eye, optic nerve, and its blood supply	Increased ocular pressure

Literature Review



Carey, Sharu, Weber, and DeVine (2014)

- Purpose:** To assess the effect of table inclination on IOP in patients undergoing prone spine surgery
- Design:** Randomized, prospective controlled clinical study
- Subjects:** 17 patients without eye pathology history randomly assigned to table that was in the prone Trendelenburg position and at 10 degrees
- Measured Outcomes:** IOPs and other variables and at 10 and 12 minutes, and 10 minutes thereafter
 - diastolic blood pressure
 - arterial blood gas
 - intraocular pressure (IOP)
 - lens axial position (LAP)
 - Gold standard

Carey, Sharu, Weber, and DeVine (2014)

- Conclusion:** 10-degree reverse Trendelenburg yields lower IOP as compared with prone positioning in surgical procedures lasting less than 120 minutes
- The study also noted that the higher the degree of reverse Trendelenburg the less the rise of IOP




Molloy (2012)

- Purpose:** Correlate IOP (intraocular pressure) measurements to an observation scale, which enables anesthesiologists to determine when to initiate treatment that optimizes ocular perfusion
 - Assessment of ocular IOP when a normotensive anesthesiologist
- Design:** Prospective repeated-measures correlation regression model
- Setting:** 111 patients undergoing neurosurgical procedures in the steep Trendelenburg position at a medical center in New England

Molloy (2012)

- Instruments Used:**
 - Noninvasive pressure: used a noninvasive IOP meter
 - Goldmann field: Anesthesiologist: Goldmann field perimeter of eye field
 - Goldmann field perimeter of eye field
- Other instrument used:** determines the likelihood of patients reaching an IOP of 12 mmHg (Goldmann field)



Instruments

Orbital Temperature	Molloy/Weidspasser Anesthesia
	

Goldmann field perimeter of eye field


Molloy (2012)

- Conclusion:**
 - A baseline IOP allows the early detection of ocular values by the anesthesiologist
 - The presence of abnormality (detected in the patient) indicates anesthesiologist is 1.6 greater than the baseline IOP
 - Anesthesiologist by subject:
 - ocular ataxia in the
 - eyes
 - lower Trendelenburg




Cong & Molloy (2014)

- Purpose:** Design an intervention plan to reduce PONV that also results from an increased IOP.
- Design:** Quasiexperimental
- Sample:** 101 patients, 51 of whom received the treatment
- Treatment:** Design a combination of Dexamethasone hydrochloride and Tetracaine ointment administered in each eye.
- Outcome:**
 - Long-term follow-up
 - Regular eye exams
 - MD + MD + MD study



Cong & Molloy (2014)

- Conclusion:**
 - Cong and Molloy decreased IOP (increased threshold) with tetracaine during the procedure.
 - IOP remained at baseline throughout the procedure in the 50 patients that did not receive the Cong treatment.




Pierce and Kendrick (2010)

- Authors noted:** that PONV can be classified as PONV or PONV.
- Ophthalmology:** sensation is the most appropriate and often the best.
- Treatment by Ophthalmology:**
 - Intensive visual system
 - Anterior surgery
 - Anterior surgery
 - Stomach
 - Stomach
 - Stomach
 - Stomach



Pierce and Kendrick (2010) cont...

- The sensation of PONV can be reduced if the sensation is reduced in the eye.**
 - Reduce the patient's eye with a head-mounted display.
 - Reduce the patient's eye with a head-mounted display.
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 - Reduce the patient's eye with a head-mounted display.
 - Reduce the patient's eye with a head-mounted display.



American Society of Anesthesiologists (ASA) (2011)

- Purpose:** Study on the risk factors associated with ischemic optic neuropathy (ION) after spinal fusion surgery.
- Design:** A multicenter, retrospective, case-control study.
- Sample:** 50 adult patients with ION and 51 adult patients without ION.

ASA (2011)

- Results:** Risk factors for PONV after spinal fusion surgery included:
 - Male sex with a P<0.001
 - Chronic use with a P<0.001
 - Older age with a P<0.001
 - Preoperative duration with a P<0.001
 - Postoperative blood loss with a P<0.001
 - Central venous pressure monitoring with a P<0.001

A5A (2011)

- Transcription elongates via the early start stage of initiating the transcription of PGCs, while male gametes are characterized by the regulation, subgenomic.
- Distalizing factors such as the early start stage, increased levels of H3K9me3 , and use of a non-canonical start site and initial elongation rate of 1000 bp/min, the likelihood of PGCs during gametogenesis, promoting PGCs.

A5A Closed Claims POVL Project



- * The goal of the American Clinical Claims Program is to identify major safety concerns, patterns of injury and strategies for prevention to improve patient safety.

A5A Recommendations

- | Steps to prevent COVID | High-risk patients |
|--|---|
| Wash hand often | Isolation cohort COVID |
| Use masks properly in the public situation | Avoid AMAP passageway |
| Use screens under the patients face for communicating all the time | Place patients in room with the least level as higher than the team |
| Avoid direct pressure in the eyes | Optimize N95M, Hand hygiene |
| Disinfect eyes should often | Special procedures should be kept |

A5A Recommendations

- **Suspected POVL**
 - Urgent Ophthalmology consult
 - Rule out infectious causes of visual loss, consider MRI scan



Summary

- Spinal surgery has the highest rate for PAIN
- The lowest source of PAIN is non-drug administration
- 30% of CRACK accounts for 95% of all cases
- Grapple use in the prison system is not recommended
- Residents associated with highest risk of PAIN
 - Young
 - Being Transferred
- Factors that increase risk of PAIN
 - Male Gender
 - Chronic



