

Intraoperative and Postoperative Anesthesia Management of Postoperative Visual Loss in
Robotic Surgeries

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Abstract

Problem Statement & Purpose

Postoperative vision loss (POVL) associated with robotic surgeries occurs at a rate of 1.9 events per 10,000 cases (Alwon & Hewer, 2016). Patients who have suffered from this event experience an increased hospital stay of 8.6 days as oppose to the standard 4.1 days. In addition, those that suffer ocular complications experience increased cost expenditures of \$49,532 from \$22,697 (Alwon & Hewer, 2016). Currently there is no standard of care in place at this level II trauma center in Baltimore, MD. Although the occurrence of this event is rare, this clinical practice guideline (CPG) was developed to effectively care for patients undergoing robotic surgery to prevent POVL.

Methods

Development of the CPG was a collaborative effort amongst an expert panel that consisted of a chief anesthesiologist, a chief certified registered nurse anesthetist, a clinical site representative, and 2 Doctors of Nursing practice (DNP) students. A thorough evidence review was conducted, and an initial CPG was drafted. The draft CPG was presented to the expert panel where the AGREE II tool was used to evaluate the quality of the CPG. Modifications were made based on AGREE II tool feedback. The final CPG was presented to anesthesia providers during grand rounds where practitioner feedback questionnaires (PFQ) were disseminated. PFQ results were reviewed and analyzed. The final CPG was assembled and disseminated to the facility.

Results

Each domain of the AGREE II tool received scores of higher than 85% with an overall average of 92% after modifications were made. Of the 25 PFQs received, 100% response rate was obtained from the three questions analyzed. Questions 8, 16, and 23 were analyzed and each received scores of 68%, 80%, and 76% respectively, strongly agreeing to adapt the CPG into practice.

Conclusion

The CPG is a culmination of evidence-based practice recommendations to be utilized throughout the perioperative period for patients undergoing robotic surgeries. Based on the results obtained from the AGREE II tool and PFQ, the CPG was accepted by the anesthesia department. Use of this CPG provides education on POVL as well facilitates positive patient outcomes for this patient population.

Introduction

Postoperative vision loss (POVL) associated with robotic surgeries occurs at a rate of 1.9 events per 10,000 cases (Alwon & Hewer, 2016). Patients who have suffered from this event experience increased hospital stay, cost expenditures, as well as emotional burden (Alwon & Hewer, 2016). Currently there is no standard of care guidelines in place at this level II trauma center in Baltimore, MD. Although the occurrence of this event is rare, this CPG was developed to effectively care for patients undergoing robotic surgery at risk of developing POVL.

Robotic surgeries offer advantages to the surgical team such as increased dexterity in the surgical field for optimal manipulation and reduces blood loss and pain. Robotic surgeries often times require patients to be in Steep Trendelenburg (ST) for extended periods of time that can result in changes in intraocular pressure. According to Freshcoln & Diehl (2014), pressures in the eye that are unable to be autoregulated can lead to POVL in the ST position. The loss of autoregulation occurs secondary to a lack of blood flow and oxygen to the optic nerve where a sustained increase in intraocular pressure creates an environment for vision loss (Molloy, 2014).

With the popularity of robotic surgeries increasing, the need for patients to be in ST has become more prevalent. ST in combination with abdominal insufflation of carbon dioxide in laparoscopic procedures increases intrathoracic pressure and ultimately produces central venous congestion (Alwon, Hewer, 2016). This congestion results in increased intraocular pressure leading to decreased oxygen delivery to the optic nerve (Molloy & Watson, 2012). Increased risk of developing POVL secondary to these surgeries is inevitable however, there is evidence in place to mitigate the potential adverse events that may potentially arise. Hence, the creation of the CPG was done to prevent the occurrence of ocular complications.

Literature Review

Molloy and Watson (2012) conducted a quasi-experimental prospective study where the level supine intervention (LSI) was evaluated for effectiveness in mitigating increased intraocular pressure that develops in patients undergoing robotic surgery in ST. Participants were divided into an intervention group and a control group. Baseline intraocular pressures were taken in the supine position at the commencement of the case, 30 minutes after being in ST, and repeated at the end in the supine position using a tonometer. Intraocular pressure of subjects in the control group were 25-54mmHg after 120 minutes in ST with only 11% returning to baseline. LSI group had pressures of 10-33mmHg with 75% of patients returning to baseline. The findings were statistically significant with an overall decrease in average intraocular pressure ($p < 0.001$).

Gkegkes, Karyds, Tytzis, & Iavazzo (2014) conducted a literature review to evaluate the prevalence of ocular complications that result from robotic surgeries. Of the 142 patients that participated, the main complication reported was increased intraocular pressure with corneal abrasion, ischemic optic neuropathy, and POVL being the second most highly reported (Gkegkes, Karyds, Tytzis, & Iavazzo, 2014). A common theme amongst the literature reviewed is the importance of ocular protective interventions to mitigate ocular complications. These interventions include a combination of rest periods from ST, ocular dressings/taping with lubricating eye drops, fluid restrictions of less than 1500 ml intraoperatively or 20ml/kg, followed by meticulous postoperative ocular assessments.

A double blind randomized controlled trial was conducted comparing the effectiveness of the use of dorzolamide-timolol ophthalmic solution (Cospot) with a standard salt solution in patients undergoing robotic surgery in ST (Molloy, 2010). Patients were divided into a control and intervention group where baseline intraocular pressures were measured in the supine position, measured in 30-minute intervals during ST, and measured again in the supine position

at the conclusion of surgery. Findings were significant ($P>0.001$) in that patients receiving Cosopt had lower intraocular pressures with a mean average of 24.11mmHg versus the control group's mean average of 30.88mmHg.

Adisa, Onakpoya, Adenekam, and Awe (2016) conducted a comparative study where changes in intraocular pressure was observed during laparoscopic procedures. A total of 40 adults undergoing laparoscopic procedures without eye disease were recruited. Participants were divided into group A, those receiving procedures requiring reverse Trendelenburg ($n=20$) and group B, those receiving procedures requiring ST ($n=20$). Findings were statistically significant ($P<0.12$), with patients requiring ST having an 80% increase in intraocular pressure in comparison to the 45% increase seen in patients requiring reverse Trendelenburg. Furthermore, intraocular pressure had returned to baseline levels in all patients requiring reverse Trendelenburg (100%) and only returned to 3 patients requiring ST (15%).

Awad, Santilli, Ohr, Roth, and Yan (2009) conducted a prospective study to quantify the changes in intraocular pressure and the operative dynamics that can be attributed to these changes in patients in ST during robotic prostatectomies. A total of 33 patients without a history of ocular disease scheduled for robotic prostatectomies were selected. Intraocular pressure was measured at 7 different times including awake in the supine position (T1), under anesthesia in the supine position (T2), shortly after carbon dioxide insufflation (T3), at the beginning of ST (T4), at the end of the procedure in ST (T5), in the supine position before emergence (T6), and 1 hour after emergence in the supine position (T7). Findings were statistically significant ($P<0.0001$) where intraocular pressure was 13.3 ± 0.58 higher at the T5 point compared to the T1 point. Furthermore, carbon dioxide insufflation increased intraocular pressure on average by 0.21mmHg and an increase in 0.05mmHg per minute was observed in ST. Anesthesiology

(2019) recommends practicing fluid restrictions where euvolemia (20ml/kg) is maintained and rejects the usefulness of COSOPT eye drops being used prophylactically in order to mitigate intraocular pressure changes. The effectiveness is more so seen over a prolonged period of time as oppose to a single administration.

Synthesis

These studies have all shown the detrimental effects being in ST over long periods of time could be at maintaining intraocular pressure and perfusion. They have concluded that the combination of ischemia and the inability for the body to autoregulate intraocular pressures may lead to POVL. Thus, the unanimous conclusion of the importance and benefit of instituting ocular protective based interventions in patients undergoing robotic surgery where ST is needed for prolonged time periods.

Theoretical Framework

The clinical practice guideline proposed can be described as following Lewin's (1947) methodology of unfreezing, changing, and freezing to facilitate change. Lewin's theory of change is described as a three-step process involving rejecting the current practice, changing/implementing a new practice, and finding methods to solidify a new practice change and make it standard (Lewin, 1947).

Unfreezing

The unfreezing process involved bridging the knowledge gap of staff by providing them with evidence to adequately care for patients receiving robotic assisted procedures. The unfreezing process was a pivotal step where assessments were made to evaluate readiness to change amongst staff and also identify the resources that needed to be in place for change to

occur (Lewin, 1947). This step involved the correction of ineffective strategies and lack of education regarding POVL to allow for rebirth of a new standard.

Change/Freeze

The change step was implementation. This step was dynamic and multifactorial, consisting of an extensive transition period (Lewin, 1947). At this time, the clinical practice guideline was developed with help from the expert panel. The expert panel along with external ancillary staff worked cohesively to create a CPG that was feasible for this institution. Lastly, the freeze step involves sustainability. Strategies were put in place to make the practice change developed throughout the change phase concrete and the new standard of care (Lewin, 1947).

Methods

Creation of this CPG aimed to improve outcomes amongst patients receiving robotic surgeries. At this facility, several robotic surgeries are performed on a weekly basis. Given the successful adoption of this CPG into practice, the occurrence of POVL can be prevented.

Data Collection

To assess the quality and feasibility of the CPG, the AGREE II Tool (Appendix A) and Practitioner Feedback Questionnaire (PFQs) (Appendix B) were disseminated. The AGREE II tool was given to the expert panel at education sessions and initial meetings to assess the level of complexity and quality of the CPG. The tool consisted of 23 items organized into 6 domains where each domain assessed an aspect of the guideline's quality. Furthermore, the Practitioner Feedback Questionnaire was disseminated during grand rounds to assess CPG feasibility. The questionnaire was a 23-item survey that allowed for practitioners to determine if the CPG was realistic and within the means of the facility.

Data Analysis

Data collection using the AGREE II tool was statistically analyzed using Microsoft Office's Excel. Initially, the sum of all the scores achieved per each individual item per domain were calculated into percentages of the highest scores in each individual domain. Domain scores were achieved using the following formula: $[(\text{obtained score} - \text{minimum possible score}) / (\text{maximum possible score} - \text{minimum possible score})]$ (AGREE Next Steps Consortium, 2009). To further analyze the quantitative data, statistical analyses including mean scores and t-tests were also done. PFQs were used to generate qualitative data. This data was thoroughly reviewed and analyzed by the expert panel for CPG revision and modification purposes.

Phase I

The clinical practice guideline query was presented to the Institutional Review Board (IRB) for the University of Maryland, Baltimore to host the CPG project. The CPG project was determined non-human research; therefore, IRB approval was not required. Meetings with the clinical site representative was conducted where POVL was discussed in detail along with the first official presentation of the literature review. The expert panel was identified at this time and routine meetings were held to facilitate CPG development.

Phase II

The first meeting was conducted with the expert panel as an education session where initial drafts of the CPG was introduced. The AGREE II tool was disseminated at this time. Results were analyzed and used for CPG modifications. The second meeting was used to present the final CPG for approval by expert panel.

Phase III

The final CPG was presented to the anesthesia department during grand rounds via PowerPoint. During the presentation, practitioner feedback questionnaire (PFQs) were provided. PFQs collected were analyzed and evaluated for possible revisions.

Results

Analyses of the data obtained throughout the implementation phase was done through the use of descriptive statistics. Domain scores ranged from 88%-96%. The highest scored domain was “Stakeholder Involvement” with a score of 96%. The domains “Editorial Independence” and “Clarity of Presentation” followed with scores of 94% and 92% respectively (refer to Table B). PFQ response demographics included certified registered nurse anesthetists, anesthesiologists, and student registered nurse anesthetists ranging from 5-25+ years of clinical experience. A total of 25 PFQs were received and 3 questions were selected for evaluation (See Appendix B). Criteria for choosing the 3 questions for analysis included a 100% response rate. Question 8 (agreeing to the recommendations of the CPG), question 16 (CPG to be accepted by anesthesia colleagues), and question 23 (using recommendations on the current patient population) were selected to evaluate overall provider feedback of the CPG. The calculated scores for each question with strongly agreed responses were 68%, 80%, and 76% respectively. The CPG received an average of 85% of strongly agreed responses which reveals overall acceptance of the practice change amongst the anesthesia providers.

Structures and Processes

Facilitation of this clinical practice guideline required the manipulation of certain processes and structures within this facility’s system to support longevity and sustainability. The main structure changed was the educational background of staff on POVL. Addressing this

structure involved several education sessions where the evidence was shared which facilitated enthusiasm for CPG development.

The major process changed was the incorporation of the interventions within the clinical practice guideline into practice. As more educational sessions were held and more awareness was created around POVL, the culture to change amongst staff was heightened and steered the anesthesia providers in the direction of curiosity. This curiosity was then used to propel staff into acceptance of the CPG and readiness for adoption into practice.

Barriers and Facilitators

Barriers and facilitators played a role in the creation of the CPG. One facilitator was the varying range of the quality of evidence found on POVL which facilitated a thorough compilation of evidence-based practice interventions. Another facilitator was the level of enthusiasm amongst staff and the expert panel that was generated surrounding CPG development. This enthusiasm made it feasible to conduct meetings and create a readiness to change environment amongst staff.

Initially, the administration of the COSOPT eye drops were incorporated within the intraoperative portion of the CPG. A barrier was developed in reference to the financial feasibility of the drop administration. Recommendations were given per a physician outside of the expert panel who had done extensive research on POVL to remove the drops as they have not been shown to be effective throughout the perioperative period. A second look into the evidence was warranted to evaluate the validity of the recommendation. The drops were removed from the CPG on the basis of what was found in the literature in addition to the increase in cost expenditure administration of the drops would have on the institution.

Discussion

The CPG aims to provide providers with a set of interventions necessary to prevent the occurrence of POVL in patients undergoing robotic surgery. The results obtained from the AGREE II tool and the PFQs suggested an overall acceptance of the CPG amongst providers. The CPG will not only prevent an adverse event from occurring but also provides the institution with a standard of care for successfully caring for this patient population. All patients undergoing robotic surgery are at risk of developing POVL secondary to the amount of time that may be spent in ST which in turn could compromise ocular autoregulation and perfusion. This CPG was designed to assist with these issues such that a more severe complication will not occur.

Upon exploring the evidence, a limitation that was discovered was the lack of level 1 evidence including randomized controlled trials that may have strengthened the credibility of the interventions included within the CPG. Another limitation was the abundance of evidence found involving POVL in spine surgeries rather than specifically robotic surgeries. To overcome such limitations, all evidence found were thoroughly reviewed and what was able to be of use and pertinent to the development of this CPG was taken under consideration. Furthermore, a more in depth look into the evidence was warranted along with close collaboration with the expert panel in order to adequately create a CPG that was feasible, systemic and pertinent to this patient population within the means of this level II trauma center.

The data collection process proved to be beneficial in that it provided a layered method receiving CPG approval. The AGREE II tool was instrumental at assessing quality by identifying areas of the CPG that were not as strong as other components of the CPG. By using this tool, modifications such as removal of the COSOPT drops were possible and allowed for a stronger guideline to be presented to the anesthesia department. Based on the results obtained from the PFQs, the CPG was well received and strongly agreed upon by 85% of staff in attendance during

the grand rounds presentation. The CPG was deemed overall clear, concise, and easily adoptable into practice.

Conclusion

For sustainability purposes, a perspective plan should be in place to maintain the enthusiasm surrounding the use of the CPG. Project champions should be appointed to monitor the progression and adherence of the CPG. Information collected will then be presented to leadership or the expert panel for modification purposes if need be. Furthermore, a re-analysis of the evidence should be done at quarterly intervals to ensure CPG standards of care continue to be applicable to the institution and the patient population. Major contributors to this sustainability strategy include anesthesia providers, operating room staff, as well as leadership within each respective department.

Future quality improvement endeavors could use this methodology of developing this CPG as a foundation for instituting any change. Identifying a need within this institution was the primary step in developing this CPG. Furthermore, supplementing that need with education by using up to date evidence assisted with enhancing the readiness to change. When the culture to change is in place, creation of a CPG was facilitated through fluid forms of communication and participation from all avenues. Despite unforeseen barriers, one factor that always seemed to assist with overcoming them was relying on the evidence. Hence, the need for evidence based driven practice. POVL will continue to be a potential adverse event to robotic surgeries however, by creating this CPG, the knowledge deficit has been supplemented and a systematic approach towards mitigation can be instituted at this time.

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Table A: Evidence Table

Author, year	Study objective/intervention or exposures compared	Design	Sample (N)	Outcomes studied (how measured)	Results	*Level and Quality Rating
Gkegkes, Karydis, Tyitzis, & Iavazzo, 2014	To evaluate the ocular complications that can result from robotic surgeries.	Literature Review	Eight articles were used throughout this search to include 142 patients that have all undergone robotic surgeries	The occurrence of ocular complications such as increased intraocular pressure, corneal abrasion, ischemic optic neuropathy, and postoperative vision loss that resulted from a robotic surgery.	1) The most highly reported ocular complication reported was increased ocular pressure within five of the eight studies. 2) Corneal abrasion, ischemic optic neuropathy, and postop vision loss were the second highly reported occurrences in two of the studies.	5B
Mizumoto, Gosho, Zako, 2017	To evaluate the ocular functional changes of patients before and after robotic assisted laparoscopic prostatectomy.	A comparative observational study	44 eyes were evaluated of 22 males scheduled for a robotic assisted laparoscopic prostatectomy from August 2012 to July 2013.	Intraocular pressure was measured in supine position (T1), measured immediately after being placed in steep Trendelenburg (T2), and again in supine at the end of the procedure(T3). Humphrey perimetry (human visual field) was measured before surgery as well as 3 months and 6 months after surgery.	The average intraocular pressures at all three positions were: T1=10.4mmHg, T2=21.7mmHg, and T3=29.6mmHg with statistical significance of P<0.001. There were no significant changes in visual acuity per the Humphrey perimetry before and after surgery P-value= 0.96.	3B

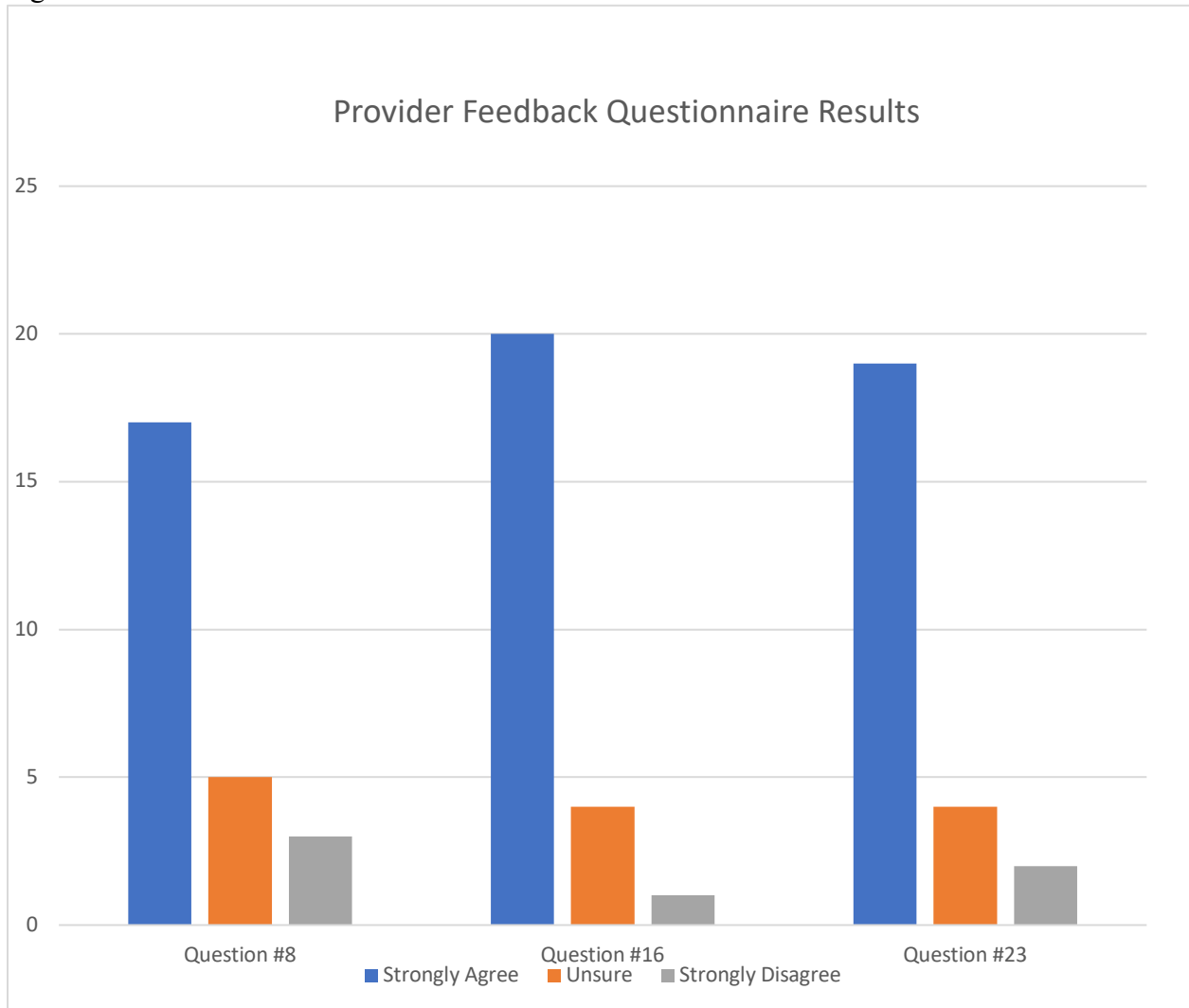
Molloy, 2010	To evaluate the effectiveness of Cosopt (an eye drop solution used to treat glaucoma) against a standard balanced eye salt solution to help decrease the occurrence of increased intraocular pressure that could lead to postoperative vision loss.	Double blind randomized controlled trial	N=90 where 42 patients were male, 48 patients were female all receiving robotic surgery requiring steep Trendelenburg.	The Cosopt and the balanced salt solution eyedrops were administered to patients at random preemptively and intraocular pressure was then measured using a tonometer for comparison purposes.	Cosopt drops significantly decrease the intraocular pressure of patients needing laproscopic procedures in steep Trendelenburg position when given preemptively in comparison with the control group as evidenced by (Control group intraocular pressure of 30.88mmHg after two hours versus the intervention group pressure of 24.11mmHg with a p value of <0.001).	2A
Molloy & Watson, 2012	Evaluating the cause and effect relationship of time spent in steep Trendelenburg on intraocular pressure that could result in decreased ocular perfusion as well as using a 5-minute supine intervention every hour in steep Trendelenburg position to help with returning intraocular pressure to baseline.	Quasi-experimental prospective design	Exclusion criteria included: free of diabetes, hypertension, or any ocular or vascular disease undergoing laparoscopic bowel or pelvic gynecological procedures greater than 120 min. Intervention group participated in the 5-minute supine intervention while the control group received the standard of care.	Intraocular pressure measurements were taken at baseline in the supine position, then re-taken 30 min into being in steep Trendelenburg, and remeasured at the end of surgery using a tonometer. Data was collected over a one-year period and an anesthesia research team analyzed data for results.	Intraocular pressure of those patients in steep Trendelenburg without the supine intervention ranged from 25-54mmHg, with an 11% return to normal baseline at the end of case. Intraocular pressure of those in the intervention group had pressures of 10-33mmHg with a 75% return to normal baseline at the end of case. Analysis proved to be statistically significant per p value of <0.001.	2A
Awad, Santilli, Ohr, Roth, & Yan (2009)	This study's aim was to quantify the changes intraocular pressure and discover the factors that contribute to these changes when patients are ST during robotic prostatectomies.	Prospective Study	N=33 patients undergoing robotic prostatectomies.	IOP measured at 7 different times: T1= supine and awake T2= anesthetized and supine T3= at the time of abdominal insufflation T4= in ST	Findings were statistically significant (P<0.0001) where intraocular pressure was 13.3 ± 0.58 higher at the T5 point compared to the T1 point. Furthermore, carbon dioxide insufflation increased intraocular pressure on average by 0.21mmHg and an increase in 0.05mmHg per minute was observed in ST.	2A

				<p>T5= in ST at the end of the procedure T6= supine before emergence T7= 1 hour after emergence in the supine position</p>		
<p>Adisa, Onakpoya, Adenekam, and Awe (2016)</p>	<p>This study investigated the changes in IOP with positioning changes during laparoscopy.</p>	<p>Comparative Study</p>	<p>N=40 patients undergoing any laparoscopic procedure requiring reverse Trendelenburg or Trendelenburg</p>	<p>Participants were divided into two groups N=20 rTr (reverse Trendelenburg) N=20 Tr (Trendelenburg)</p>	<p>Finds were statistically significant (P<0.12), with patients requiring ST having an 80% increase in intraocular pressure in comparison to the 45% increase seen in patients requiring reverse Trendelenburg. Furthermore, intraocular pressure had returned to baseline levels in all patients requiring reverse Trendelenburg (100%) and only returned to 3 patients requiring ST (15%).</p>	<p>2B</p>
<p>Gkegkes, Karydis, Tyitzis, & Iavazzo, 2014</p>	<p>To evaluate the ocular complications that can result from robotic surgeries.</p>	<p>Literature Review</p>	<p>Eight articles were used throughout this search to include 142 patients that have all undergone robotic surgeries</p>	<p>The occurrence of ocular complications such as increased intraocular pressure, corneal abrasion, ischemic optic neuropathy, and postoperative vision loss that resulted from a robotic surgery.</p>	<p>1) The most highly reported ocular complication reported was increased ocular pressure within five of the eight studies. 2) Corneal abrasion, ischemic optic neuropathy, and postop vision loss were the second highly reported occurrences in two of the studies.</p>	

Table B
Quality Score for Each AGREE II Tool Domain

	Obtained Score	Domain Score
Domain 1: Scope of Practice	57	88%
Domain 2: Stakeholder Involvement	61	96%
Domain 3: Rigor of Development	133	88%
Domain 4: Clarity of Presentation	60	94%
Domain 5: Applicability	77	91%
Domain 6: Editorial Independence	39	92%

Figure 1:



Appendix A: AGREE II Score Sheet

Domain	Item	AGREE II Rating					
		1 <i>Strongly Disagree</i>	2	3	4	5	6
Scope and purpose	1. The overall objective(s) of the guideline is (are) specifically described.						
	2. The health question(s) covered by the guideline is (are) specifically described.						
	3. The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.						
Stakeholder involvement	4. The guideline development group includes individuals from all the relevant professional groups.						
	5. The views and preferences of the target population (patients, public, etc.) have been sought.						
	6. The target users of the guideline are clearly defined.						
Rigor of development	7. Systematic methods were used to search for evidence.						
	8. The criteria for selecting the evidence are clearly described.						
	9. The strengths and limitations of the body of evidence are clearly described.						
	10. The methods for formulating the recommendations are clearly described.						
	11. The health benefits, side effects and risks have been considered in formulating the recommendations.						
	12. There is an explicit link between the recommendations and the supporting evidence.						
	13. The guideline has been externally reviewed by experts prior to its publication.						
	14. A procedure for updating the guideline is provided.						
Clarity of presentation	15. The recommendations are specific and unambiguous.						
	16. The different options for management of the condition or health issue are clearly presented.						
	17. Key recommendations are easily identifiable.						
Applicability	18. The guideline describes facilitators and barriers to its application.						
	19. The guideline provides advice and/or tools on how the recommendations can be put into practice.						
	20. The potential resource implications of applying the recommendations have been considered.						
	21. The guideline presents monitoring and/ or auditing criteria.						
Editorial independence	22. The views of the funding body have not influenced the content of the guideline.						

Appendix B: Practitioner Feedback Questionnaire

For each item, please check off the box that most adequately reflects your opinion.

1. Are you responsible for the care of patients for whom this draft guideline report is relevant? This may include the referral, diagnosis, treatment, or follow-up of patients.	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unsure <input type="checkbox"/>
If you answered “No” or “Unsure”, there is no need to answer or return this questionnaire. If you answered “Yes”, please answer the questions below and return to [enter expected destination of surveys].			
	Strongly agree	Neither agree or disagree	Strongly disagree
2. The rationale for developing a guideline is clear.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. There is a need for a guideline on this topic.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The literature search is relevant and complete (e.g., no key evidence was missed nor any included that should not have been) in this draft guideline.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I agree with the methodology used to summarize the evidence included in this draft guideline.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. The results of the evidence described in this draft guideline are interpreted according to my understanding of the evidence.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. The draft recommendations in this report are clear.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I agree with the draft recommendations as stated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. The draft recommendations are suitable for the patients for whom they are intended.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. The draft recommendations are too rigid to apply to individual patients.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. When applied, the draft recommendations will produce more benefits for patients than harms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. The draft guideline presents options that will be acceptable to patients.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. To apply the draft recommendations will require reorganization of services/care in my practice setting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. To apply the draft guideline recommendations will be technically challenging.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. The draft guideline recommendations are too expensive to apply.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. The draft guideline recommendations are likely to be supported by a majority of my colleagues.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. If I follow the draft guideline recommendations, the expected effects on patient outcomes will be obvious.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. The draft guideline recommendations reflect a more effective approach for improving patient outcomes than is current usual practice. (If they are the same as current practice, please tick NA). NA <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. When applied, the draft guideline recommendations will result in better use of resources than current usual practice. (If they are the same as current practice, please tick NA). NA <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I would feel comfortable if my patients received the care recommended in the draft guideline.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. This draft guideline should be approved as a practice guideline.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. If this draft guideline were to be approved as a practice guideline, I would use it in my own practice.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. If this draft guideline were to be approved as a practice guideline, I would apply the recommendations to my patients.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Provider feedback/comments:			

Adapted from: Brouwers, M.C., Graham, I.D., Hanna, S.E., Cameron, D.A., & Browman, G.P. (2004). Clinicians' assessments of practice guidelines in oncology: The CAPGO survey. *International Journal of Technology Assessment in Health Care*, 20(4), 421-6.