

# Experience of operating an anesthesia preoperative evaluation clinic in South Korea

## An observational study of surgeons' satisfaction

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### Abstract

The benefits of an anesthesia pre-operative evaluation clinic (APEC) based on outpatients are well described in previous literatures. In the majority of hospitals in South Korea, preoperative anesthetic evaluation for surgical patients is limited to hospitalized patients on the day before surgery. Thus, we would like to share our institutional experience of implementing an APEC based on outpatients and report on the attitudes and satisfaction of the medical staff (surgeons).

A 2-page survey was distributed to all specialists and resident physicians involved in surgery at a single university hospital during a 3-month period. A 5-point Likert scale of agreement and an open-ended question examined perceptions of APEC. A total of 123 questionnaires were distributed and 67 surveys were collected over a 3-month period with a 54.5% collection rate. The surgeons' perceptions of APEC are summarized in Figure 1. It is difficult to state the tendency of surgeons' perception of the clinic, including workload, patient satisfaction, patient safety, necessity, cost-effectiveness, and efficiency through this survey. However, many surgeons chose to comment on suggestions to improve the quality of the APEC through the open-ended question.

The surgeons' attitude and satisfaction to anesthetic services including APEC are an important component of achieving quality improvement. Although it is difficult to state the tendency of surgeons' perception of the clinic, including workload, patient satisfaction, patient safety, necessity, cost-effectiveness, and efficiency through this survey, continuous assessment and feedback may improve efficiency of the APEC and affect patient perception as well.

**Abbreviations:** APEC = anesthesia pre-operative evaluation clinic.

**Keywords:** preoperative care

## 1. Introduction

The primary role of an anesthesia pre-operative evaluation clinic (APEC) is to evaluate patients to perform risk assessment and make decisions of perioperative management before surgery. In the majority of hospitals in South Korea, preoperative anesthetic evaluation for surgical patients is performed mainly in hospitalized patients. The surgeon generally consults the anesthesiologist for pre-anesthesia evaluation and preparation on the day before surgery for patients in the ward. Despite the known advantages of

the outpatient-based APEC, it is limited in Korean hospitals due to lack of anesthesiologists and lack of awareness of the surgeons and hospital executives of the necessity for the system.<sup>[1–6]</sup>

The surgeon is an important client of the anesthesiologist, and thus, we felt it was critical to explore the level of satisfaction of surgeons of our anesthetic service (APEC) to improve quality. The surgeons' attitude and satisfaction to anesthetic services are an important component affecting patient perception as well.<sup>[7]</sup> The purpose of this study was to introduce the attitudes and satisfaction of the medical staff towards our APEC, and to share our institutional experience of implementing an APEC based on outpatients.

## 2. Methods

The institutional review board at our institution approved a waiver of consent (IRB No. 05-2018-014). A 2-page survey was emailed to 123 specialists and resident physicians involved in surgery at a single university hospital during a 3-month period. Surveys not returned within 6 weeks were mailed repeatedly. A 5-point Likert scale of agreement examined perceptions of APEC regarding workload, patient satisfaction, patient safety, necessity, cost-effectiveness, and efficiency (Table 1). The surgeons were offered the opportunity to express themselves, on topics covered or not by the Likert-type questions, through an open-ended question.

Data were analyzed with SPSS (ver. 21 for Windows; SPSS Inc., Chicago, IL). Noncontinuous data were analyzed with the chi-square test.  $P < .05$  was considered statistically significant.

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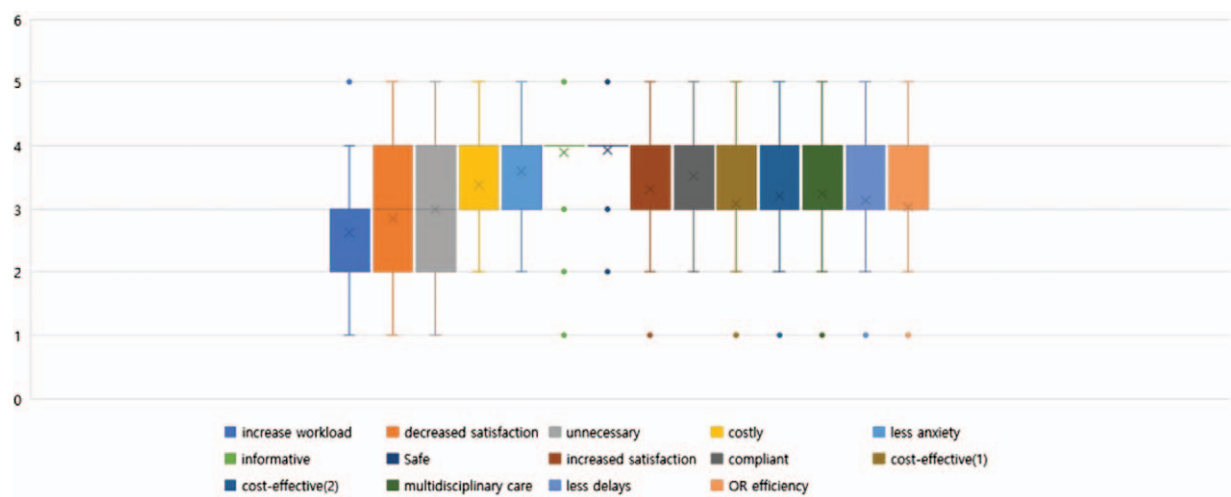
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**Figure 1.** Surgeons' perception of APEC. APEC increases workload (increase workload); increases patient complaints (decreased satisfaction); unnecessary for healthy patients (unnecessary); increases medical expenses (costly); decreases patient anxiety (less anxiety); helps obtain and understand appropriate information about anesthesia services (informative); important for patient safety (Safe); improves patient satisfaction (increased satisfaction); improves patients' compliance with pre-operative instructions (compliant); decreases unnecessary evaluations (cost-effective(1)); decreases unnecessary consults (cost-effective(2)); facilitates multidisciplinary care (multidisciplinary care); reduces delays and cancellations of surgery (less delays); and improves operating room efficiency (OR efficiency). Data are displayed as median, range, and interquartile range. APEC = anesthesia pre-operative evaluation clinic.

3. Results

A total of 123 questionnaires were distributed and 67 surveys were collected over a 3-month period with a 54.5% collection rate. Out of 14 questions, the mean number of answers was 13. Response rates for individual questions varied from 98.5% to 89.6%. The population characteristics of the respondents are shown in Table 2. The majority of respondents were in the age group of 30 to 40 years (61.2%) and 40 to 50 years (29.9%), and had 1 to 5 years of experience in practice related to surgery (52.2%).

The surgeons' perceptions of APEC are depicted in Figure 1. A 5-point Likert scale of agreement on perception of APEC demonstrated an interquartile range of: 2 to 3 on increased workload; 2 to 4 on increased patient complaints; 2 to 4 on necessity for healthy patients; 3 to 4 on increased medical expenses; 3 to 4 on decreased patient anxiety; 4 on informative aspects to obtain and understand appropriate information about

anesthesia services and importance for patient safety; 3 to 4 on improvement of patient satisfaction, improvement on patients' compliance with pre-operative instructions, decreased unnecessary evaluations, decreased unnecessary consults, facilitation of multidisciplinary care, reduction of delays and cancellations of surgery, and improvement of operating room efficiency (Fig. 1).

4. Discussions

Quality improvement is of continuous interest to anesthesiologists. Surgeons are not only coworkers but also important clients of anesthesiologists, along with patients, students, and hospital executives. Although this study did not effectively reveal a distinct tendency of surgeons' perception of the APEC, continuous assessment and feedback may improve efficiency of the APEC and affect patient perception as well. Correcting faulty conceptions or perception may lead to improvement of surgeons' satisfaction to

**Table 1**  
Anesthesia pre-operative evaluation clinic satisfaction questionnaire.

No.	Questions	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	APEC increased my workload.	1	2	3	4	5
2	APEC increased patient complaints.	1	2	3	4	5
3	It is unnecessary for healthy patients without comorbidities to visit APEC.	1	2	3	4	5
4	APEC increases medical expenses.	1	2	3	4	5
5	APEC is beneficial in decreasing patient anxiety.	1	2	3	4	5
6	APEC helps patients obtain and understand appropriate information about anesthesia services.	1	2	3	4	5
7	APEC is important for patient safety.	1	2	3	4	5
8	APEC improves patient satisfaction.	1	2	3	4	5
9	APEC improves patients' compliance with pre-operative instructions (e.g., medication, fasting, etc.).	1	2	3	4	5
10	Unnecessary evaluations were reduced with APEC.	1	2	3	4	5
11	Unnecessary consults were reduced with APEC.	1	2	3	4	5
12	APEC facilitates multidisciplinary care.	1	2	3	4	5
13	APEC reduces delays and cancellations of surgery.	1	2	3	4	5
14	APEC improves operating room efficiency.	1	2	3	4	5

APEC=anesthesia pre-operative evaluation clinic.

**Table 2**  
**The population characteristics of the respondents.**

Variable	n	%
Age (yr)		
<30	3	4.5
30–40	41	61.2
40–50	20	29.9
>50	2	3.0
No response	1	1.5
Specialty		
General surgery	17	25.4
Cardiothoracic surgery	7	10.4
Neurosurgery	12	17.9
Plastic surgery	3	4.5
Urology	5	7.5
Orthopedic surgery	5	7.5
Obstetrics and Gynecology	1	1.5
Ophthalmology	4	6.0
Otorhinolaryngology	2	3
No response	11	16.4
Position		
Professor	40	59.7
Physician in fellowship	5	7.5
Physician in residency	21	31.3
No response	1	1.5
Years in practice		
<1	6	9
1–5	35	52.2
5–10	9	13.4
>10	15	22.4
No response	2	3

anesthesia services, such as APEC and relationships among departments. We believe investigating surgeons' perception of APEC through questionnaires brought up corrective actions and an open discussion which will contribute to improvement of relationships among departments, the work environment and, ultimately, patient care.

The benefits of an outpatient-based APEC have been well reported in previous literature. It enables the anesthesiologist to meet with the patient in the earlier process of evaluation before surgery, promotes pre-operative interviews, communication between medical staff and patient, participation of anesthesiologists in clinical protocol development, and advocates post-operative care to reduce pain, complications, morbidity and mortality.<sup>[5]</sup> Operating an APEC is known to prevent unnecessary consults prior to surgery, decrease cancellation or delay of surgery due to incomplete preoperative preparation, reduce expenditure due to unnecessary evaluations, increase efficiency of standardized surgical protocols, increase patient satisfaction, and is suggested to reduce cost through reduction of surgical cancellations, decrease of hospital stay and re-hospitalization, and reduction in in-hospital mortality.<sup>[1–6]</sup> In this context, APECs are designed to identify patients' risk factors with the aim of stratifying and mitigating the effect of risk factors associated with increased perioperative morbidity and mortality. Patients should be assessed in a focused and systematic manner based on evidenced-based established guidelines with the aim of reducing the perioperative morbidity and mortality, and a clear record should be kept in the medical records for all practitioners involved. All necessary investigations and consultations should be done in a timely manner to avoid surgical delays or

cancellations. The purpose should not be just to clear the patient for surgery, and rather to prepare him or her for it.

Although advantages and clinical benefits of an APEC have been reported in previous literature, there has been no report on the attitudes and satisfaction of the medical staff towards the APEC. The anesthesiologist-led APEC of our institution is the first of its kind in South Korea to engage all patients scheduled for elective surgery in an out-patient setting. In addition to previously revealed factors that play a role in an implementation of an APEC such as financing and cooperation of the professional groups involved, underlying factors, such as perceptions of the professionals involved,<sup>[8]</sup> there are a few components which contributed to the implementation of an APEC at our institution: healthcare accreditations requiring consents for anesthetic services or surgical procedures before surgery, a legislation enacted in 2015 in Korea indicating that the working hours of resident physicians be strictly limited to 80 hours per week, and especially the increasing prevalence and popularity of same day surgery served as a catalyst for the APEC to form an established role.

Our APEC is situated in the main out-patient department block near surgical specialties. This promotes easy accessibility, convenience, and capability for the patients to be assessed at the APEC on the same day as their surgical appointments. The clinic provides adequate space demarcated into areas for registration, reception, patient interview, and examination. A senior specialist is responsible for policy administration and quality assurance. One anesthesiologist and one trainee in anesthesia is in charge of patient interviews. Resident physicians are posted to the clinic as part of their training to ensure training in pre-anesthesia evaluation and optimization. Any case found to have an American Society of Anesthesiologist (ASA) status score of >II, and any queries regarding the optimization and fitness of the patient is discussed with the senior anesthesiologist posted to the clinic, or the senior specialist responsible for quality assurance, so as to avoid last minute cancellations. In general, patients are screened at the APEC from 3 days or more, and possibly within 30 days before their scheduled date of surgery. The basic information about the patients, past medical and anesthetic history is obtained with the help of a specially designed questionnaire. This is distributed to the patients in the waiting area and filled by them with the help of guardians/staff nurses. This reduces the workload of the interviewing anesthesiologist, and hopefully will contribute to improving the overall functioning of the APEC. The details of the preanesthetic check-up of the patients are saved as electronic medical records and shared with personnel and departments involved in the patients' care. Such database allows standardization of patient information, avoid redundancy, and provide a database for research.

It is difficult to state the tendency of surgeons' perception of the clinic, including workload, patient satisfaction, patient safety, necessity, cost-effectiveness, and efficiency through this survey. However, many surgeons chose to comment on suggestions to improve the quality of the APEC through the open-ended question: clarify information regarding additional evaluations or consults after anesthesia interviews, extend working hours so that patients would not have to revisit the hospital just to be evaluated in the APEC, more thoroughly inspect the patients' medications (e.g., antiplatelet agents), perform a more intimate and personalized anesthetic interview, and limit evaluation of patients in the APEC to patients of ASA status III and up. They also expressed concerns that the shortage of anesthesia personnel

due to physicians involved in the APEC may lead to decreased efficiency in the operating rooms. This study encompasses a few additional limitations. First, the process of implementing an APEC may not be generalizable in other institutions due to the differences and flexibility in supply of finances and staff, perception of the surgeons and hospital executives towards APEC, etc. Second, the surgeons' position (specialist or resident physician), age, and the risk profiles of surgeries performed may have influenced the outcome of the study. For instance, surgeons who perform more high-risk surgeries may be more favorable towards APEC. In addition, although a 54.5% collection rate is acceptable in email-based surveys, the relatively small sample size of 67 surveys is a major limitation of the study.

While we were in preparation for implementing the APEC, we were faced with challenges such as the shortage of staff, limitation of finance, and difficulty in persuading hospital executives. However, with increasing awareness of the benefits of an APEC with growing body of evidence-based guidelines and literature, these clinics are becoming a necessity for the optimization of perioperative care. It is still at an early phase, and to promote and manage a cost-effective APEC, education of physicians with review and adaptation of current practices supported by interdepartmental cooperation are essential. Continued inspections are also required to promote optimal outcome and patient safety as well as economic assessment.

## 5. Conclusion

The surgeons' attitude and satisfaction to anesthetic services including APEC are an important component of achieving quality improvement. Although it is difficult to state the tendency of surgeons' perception of the clinic, including workload, patient satisfaction, patient safety, necessity, cost-effectiveness, and efficiency through this survey, continuous assessment and

feedback may improve efficiency of the APEC and affect patient perception as well.

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