

# Development, Implementation, Evaluation, and Long-Term Outcome of a Program to Increase Student Interest in Anesthesia and Intensive Care Training

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## Abstract

**Objectives:** The increasing need for anesthetists has been coupled with a rising number of open training positions. Thus, there is an increased need to attract future anesthetists among students and graduates from medical universities. Using results from a questionnaire, we designed an information and training program to increase interest in anesthesia and intensive care.

**Materials and Methods:** With the use of semistructured interviews, medical students were questioned about factors influencing their decision for a speciality. We used the results to design an information and practice program for students and young doctors. This program was held 12 times at different anesthesia departments in different hospitals. Evaluation was obtained through a feedback questionnaire at the end of each sessions and with another questionnaire 2 to 4 years after the program.

**Results:** Feedback showed positive responses concerning utility for practical work, actuality, and relevance for daily practical work. There was a 22.7% response from participants for the follow-up questionnaire. Of these, 87% stated that interest in anesthesia was increased by the program, and 74% underwent practical training in an anesthesia department. Seventeen participants started a speciality training for anesthesia and intensive care medicine.

**Conclusions:** The design of this practice-oriented program was effective in eliciting, spreading, and increasing interest and attracting students to a medical speciality.

**Key words:** Anesthesiology, Human resources, Lack of personnel, Speciality training, Training program

## Introduction

The scope of speciality anesthesia and intensive care medicine has recently considerably changed. Today, the speciality includes not only core competence of treating the patient in the operating room but also, in most countries, postoperative intensive care treatment, emergency medicine and resuscitation, and pain management. In Austria, this development together with the implementation of the European Working Time Directive for Medical Doctors has led to a doubling of the number of anesthetists in the past 20 years.<sup>1</sup> However, as prognostic evaluations point out, even this increase is not sufficient to cover the future need for doctors in this speciality. In Europe, this will be further aggravated by the fact that many anesthetists are nearing retirement.

In the Kingdom of Saudi Arabia, the problem is urgent. Anesthesia is regarded as a speciality that requires hard work but provides only small rewards; this specialty has not been able to compete with specialities that allow future doctors better income and the satisfaction of a clinic for managing treatment and following patients throughout their disease course. With the rising importance of anesthesia and intensive care medicine, income levels have increased considerably; however, interest among medical students and graduates remains low. Thus, attracting new students to this speciality will require high efforts in the recruitment of graduates from medical universities so that the supply of

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specialists for anesthesia and intensive care meet the number required to allow this needed function to continue in the medical system.

In an effort to study and improve strategies to increase the interest in this speciality, we investigated the following aspects: (1) factors influencing the decision of medical students and graduates for the selection of a speciality; and (2) design and evaluation of a program to increase interest in the speciality of anesthesia and intensive care medicine.

## Materials and Methods

This study was conducted in Vienna, Austria, where the biggest medical university of Austria is located. The Vienna Hospital Service allowed and supported the study to take place in one of the hospitals. In Austria, the speciality of anesthesia automatically includes the speciality of intensive care medicine.

In a first step, we evaluated the recognition of the speciality in students and the wishes of students with regard to future working conditions by means of semistructured interviews. We used these results to design a program for the recruitment of young graduates and students. Results from this program were evaluated and compared with results from recent publications to extract common aspects and conditions in the picture of the speciality and to allow an objective communication of the pros and cons of the speciality as well as the development of practical means for the recruitment of anesthetists.

### Interviews regarding the perception of the speciality

To determine factors influencing the decision for the selection of a speciality among medical students, we used a questionnaire to conduct semistructured interviews among randomly selected students ( $n = 20$ ; median age of 23 y, 8 male and 12 female participants). We searched for factors influencing interest and attractiveness in the process of decision of a medical speciality.

### Focus:Practice Program

We used the Focus:Practice© Program (a product of Health Care Communication) in the development and implementation of a program to improve interest among medical students and graduates for speciality anesthesia and intensive care medicine; the program was based on results from the interview stage. All participants gave written consent to use of their data

in anonymized form for documentation and publication. The goal of the program was to give participants a broad view of the speciality in order to increase the attractiveness of the program and to motivate students to opt for this speciality.

Four topics were selected: (1) practical pain management, (2) perioperative anaesthesia, (3) perioperative intensive care medicine, and (4) emergency management. The duration of each Focus:Practice lecture was 4 hours and was offered at several anesthesia departments in Vienna, Austria. The number of participants was limited to 30. Each event consisted of 3 parts. In part 1, there were 3 or 4 presentations with a duration of 20 to 25 minutes and an emphasis on practical working. In part 2, there was hands-on training at 3 to 4 different locations where participants had the possibility of experiencing and training different techniques relevant to the topic (eg, airway management, intraosseous access for application of drugs, and different applications of ultrasonography). For this part, participants were divided into small groups and rotated between locations to allow optimal participation in the training. Part 3 consisted of a debriefing to allow a discussion of the contents and experiences with the referents. Referents were anesthetists from different departments of the Vienna hospitals.

Extra presentations were offered on the topics "cardiovascular anesthesia" and "mother and child, anesthesia in obstetrics and neonatal resuscitation."

All events were offered on the homepage of the student's association of the Medical University of Vienna. All participants were offered a practice turn in one of the participating anesthesia departments to further increase their knowledge of the speciality.

### Evaluation of the program

All participants received an evaluation questionnaire at the end of each event. Here, they could rate different aspects of the event on a scale from 1 (worst value) to 5 (best value). They could also add free comments on the evaluation sheet. The questionnaires were completed at the location and were immediately handed over to the organization team.

To investigate whether an evaluation from a participant was not a momentary impression and whether the program elicited a sustained value for their decision of a further career, we performed a second evaluation from March 2020 to May 2020 by E-mail, where we questioned whether any of the

participants completed a practice turn in an anesthesia department or whether they had decided on that speciality. The online questionnaire consisted of 4 questions and the possibility of free comments.

All data from participants were strictly anonymous and with their consent; no data concerning the health of the participants were noted, and no inclusion of a participant was due to a disease. In addition, none of the participants was from a vulnerable group as defined in the Helsinki Declaration. The Institutional Review Board did not classify this investigation as a clinical study and made no objections to the performance of our work.

## Results

The number of applications exceeded the possible number of participants by 4-fold. A total of 186 participants were accepted, who could apply for participation in several events, with the total number of participants in the 12 events performed between 2016 and 2018 of 331.

### Interviews with students

Practical working, the wide spectrum of the speciality, and the care of patients in emergencies were named by the students in the interviews as arguments for choosing anesthesia. Further positive aspects were the “high-tech” working field, the high number of available positions, and the interdisciplinary work, especially in the operation room. A high homogeneity was also found in answers on factors that hampered the choice of anesthesia: a lack of knowledge about possibilities of work and career in the speciality and a general lack of contact with anesthesia and intensive care during the university training. Furthermore, a lack of training positions, the dependance of work and career in a hospital, and the

lack of communication and follow-up with patients were also named.

### Results of evaluation of events

Feedback data collected at the end of the events showed very positive responses. Average satisfaction throughout all events concerning the items relevant to practical work and actuality was 4.83. Hands-on training feedback received a score of 4.80 (Table 1).

The positive results were also supported by the free comments added by the participants in the feedback protocols. A total of 118 participants added remarks, and 103 participants (87.3%) emphasized a high degree of positivity toward clinical work in the presentations and the hands-on training. The possibility for practical experience and the interdisciplinary approach were also highlighted.

### Results of the 2020 follow-up evaluation

The results of the follow-up evaluations are shown in Table 2. Of the 186 participants, 172 (92.5%) had a valid E-mail address. Of these, 39 participants (22.7%) responded to the request for follow-up at 2 to 4 years after the original events, with 97.5% responding a very positive (82%) or positive recollection of the event. Of responding participants, 87% stated that the event had influenced their interests for this speciality very positively (49%) or positively (38%). Of note, 74% of

**Table 1.** Evaluation of Events by Participants at the End of Each Event

Characteristic	Score	
Referents	Competence	4.86
	Presentation	4.71
	Practical training	4.8
Relevance for practical work	4.86	
Actuality	4.87	
Relevance for daily work	4.78	

**Abbreviations:** 118 feedback questionnaires were completed by the 186 participants (62% female participants, 83% younger than 30 years old, 91% students). Rating followed a 5-step scale with 5 as the best value.

**Table 2.** Feedback at Follow-Up From Former Participants With Valid E-mail Accounts

Question	Number (%)				
	Very Positive (yes)	Quite Positive	Neutral	Quite Negative	Very Negative (no)
What is your impression when you recall the Focus:Practice events?	32 (82.05%)	6 (15.38%)	1 (2.56%)	0	0
How did the events influence your view on a career in anesthesia and intensive care medicine?	19 (48.72%)	15 (36.46%)	5 (12.82%)	0	0
Have you applied for a practice course in anesthesia and intensive care medicine?	28		1*		10
Did you decide for a training position in a department of anesthesia and intensive care medicine?	17		8*/2 <sup>§</sup>		12

There were 186 former participants, with 172 having valid E-mail addresses at follow-up (92.5%) in which accounts were still valid and 39 (22.7%) returning responses in 2020.

\*Not yet decided. <sup>§</sup>Changed field of work.

these respondents completed a practical training in a department of anesthesia or intensive care. The final question (“Did you decide for the specialties of anaesthesia and intensive care?”) was answered with “yes” by 17 participants (43.6%), amounting to 10% of total participants (n = 172) with a still valid E-mail account. Another 20.5% had not yet taken the decision. In the area dedicated to free comments, multiple remarks were made on the value and the sustained effect of hands-on training.

## Discussion

Results of our evaluation demonstrated that interest among students and young graduates can be greatly improved by the concept of the Focus:Practice Program. Information relevant to the practical work and content of the speciality was greatly welcomed by the participants. The events that were developed with suggestions from the initial questionnaire, which included the suggestion of hands-on training, had a very positive effect on interest for the speciality among participants, which led to a number of students deciding to train in anesthesia and intensive care medicine.

To ensure a sufficient number of anesthetists for delivery of medical care, improvements in the image of anesthesia are needed, especially among graduates and medical students. Contact with this speciality is sparse in many countries, and the impression often delivered is that of dull but very hard work with few rewards. However, studies have shown that the information available to medical students is extremely important for their future decision on which speciality to choose.<sup>2</sup> Thus, it is essential to supply medical students a comprehensive view of modern anesthesia and intensive care medicine as a complex and broad field of work.

For Austria, the president of the Austrian Society for Anaesthesiology, Intensive Care Medicine, and Reanimatology (ÖGARI) addressed the importance of this problem in a presentation at the 2019 Austrian International Congress (Graz, Austria). Measures are urgently needed against the impending shortage of anesthetists and are receiving the highest priority to avoid a serious threat to medical care.<sup>3</sup> An investigation by BDO Health Care Consultancy, which was mandated by ÖGARI and presented to the directors of Austrian anesthesia departments, concluded that immediate measures are needed to

ensure continued demand for anesthetists. This was also emphasized in a position paper of the ÖGARI.<sup>4</sup>

In Saudi Arabia, the situation is almost the same. Active measures are needed to encourage new graduates to choose training in anesthesia and intensive care medicine. The shortages for these speciality are more than for any other country. More than 90% of intensivists and anesthesiologists in Saudi Arabia are not Saudi citizens.

A survey of the Austrian Board of Medical Doctors showed that young doctors who had decided upon anesthesia as a specialty were rating their training on average much higher than young doctors in other specialties.<sup>5</sup> Thus, if the training itself has this positive image, the problem must be faced earlier in the process, that is, when students are deciding upon their speciality. Students and young doctors should be given information in a timely manner on the broad possibilities and the attractiveness of anesthesia, which definitely are in contrast to the widespread image of the speciality in the public and among medical students.

This is also in accordance with many investigations from other countries and specialties.<sup>1,2,6,7</sup> With this knowledge, deficits in information can be corrected, possibilities can be highlighted, and old and wrong images of the speciality can be eliminated. The first part of our investigation in 20 students showed a deficit in knowledge on practical possibilities owned by the speciality and especially a lack of contact with anesthesia and intensive care during training at the university. This result is in accordance with a study from the University of Bochum, which investigated the image of modern anesthesia in medical students as well as their request for working conditions and their perception of the speciality.<sup>2</sup> Piontek concluded that, despite prior experiences and high satisfaction with lectures in anesthesia and intensive care medicine, the speciality is still predominantly identified with the work in the operating room and only to a lesser degree with intensive care medicine, emergency medicine, and pain management. Piontek suggested intensifying communications on the image of modern anesthesia for the further development of the speciality.<sup>2</sup>

In their investigation of emergency medicine, Chew and colleagues evaluated 800 responses to questionnaires and concluded that early contact with a speciality is important for the decision to choose a speciality.<sup>8</sup> Thus, efforts are needed toward providing

students opportunities to become acquainted with different specialities and to support their decision by practical knowledge.

During application of results obtained during the first part of our study, we found it was possible to develop a program that focused on practice and insight on broad aspects of a speciality. In our study, all presentations and teachings were performed by volunteers from participating departments. Publicity was organized by the Students Association of the Medical University of Vienna and was so successful that 4 times as many applications were received as participants could be accepted. We take this as evidence that students are deeply interested and that there is need for such events. During feedback at the end of the event and during follow-up 2 to 4 years after initial participation, participants also stated that they valued content and practice-related exercises.

Bias has to be expected with this follow-up as the call was only answered by 22.4% of participants, with answers naturally more likely given by those who kept the event in a more positive memory. However, 17 of our participants had chosen at that point (2 to 4 years following the event) to accept a training position in a department of anesthesia and intensive care medicine, accounting for almost 10% of participants. Although some may have already had interest in anesthesia before joining our program, the effect of the program was positive by either amplifying their wish or by correcting wrong expectations, which some participants may have had and which could have caused them to leave the training prematurely.

## Conclusions

We found that our program was successful in eliciting and spreading interest for anesthesia and intensive care medicine and that a considerable number of students and young doctors were supported in their decision for anesthesia and intensive care medicine.

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