The Journal of Education in Perioperative Medicine

Original Research

A Program Director Survey of the Clinical Base Year in Anesthesiology Residency Programs

AGATHE STREIFF, MD
BARBARA ORLANDO, MD
BRYAN MAHONEY, MD

Introduction

Anesthesiology training is in continuous evolution to keep pace with a dynamic profession shaped by advances in technology, medical knowledge, and the demands of the healthcare environment. Many residency programs have moved away from the traditional "one-plus-three" advanced model of training in which trainees receive intern training externally or within the same institution prior to their anesthesiology training and towards a four-year curriculum that integrates the clinical base year (CBY).[2,3] While some guidance is provided by the Accreditation Council for Graduate Medical Education (ACGME) regarding the CBY structure, programs are given great latitude in the specific clinical rotations they choose to incorporate. According to the ACGME program requirements:

At least six months of the CBY rotations must include experience in caring for inpatients in internal medicine, pediatrics, surgery, or any of the surgical specialties, obstetrics and gynecology, neurology, family medicine, or any combination of these. In addition, there should be rotations in critical care and emergency medicine, with at least one month, but no more than two months, devoted to each.

As programs develop or redesign CBYs with the goal of optimizing educational utility, many concerns remain, such as the adequacy of preparation for the latter years, prevention of failure and burnout, and whether an ideal curriculum has been achieved. For many, while the CBY can be seen as having secondary importance relative to the three clinical anesthesia training years, it can serve as the base for the formation of the perioperative consultant anesthesiologist given its primacy as an introduction to clinical practice. The required months served as a primary care team member in the inpatient setting, intensive care unit (ICU), and emergency department impart create a foundation exceeding mere clinical competence, as well as providing an introduction to ownership and responsibility in patient care and an understanding of the roles of consultants, the challenges of hospital-based care, health care economics, and the impact of this interplay on patient care. Traits such as accountability, error reporting, and compliance with national quality measures can and should be established as part of the culture of training during this first year.[4] Clinical skills directly relevant to anesthesiology practice, such as ultrasound use, have also been successfully integrated into CBY curricula with evidence of retention into the senior year of anesthesia training.[5]

Given the latitude provided by the ACGME, great heterogeneity exists regarding CBY structure and design across programs nationally. Potential reasons for this heterogeneity may be a result of institutional staffing needs, the existing rotations structures preceding CBY development within each program, feedback from house staff, and changes in department leadership. To facilitate an effective CBY evolution, some programs have created specific curricula for assessment of intern readiness for the clinical anesthesia years.[6] However, it is unclear what impact CBY has on performance measures compared to those who only completed their intern training as part of an advanced program in the same institution.[7] Furthermore, the curricular structure, design, and feedback mechanisms of CBYs nationally have not been well defined. To better understand existing rotation options, we have surveyed US residency program directors about their clinical base years.

Methods

Following Institutional Review Board committee review and approval, program directors from 130 ACGME-accredited programs in the United States received an anonymous and confidential survey via electronic email utilizing the web-based Survey Monkey application for data collection and storage (Appendix, Table 1). Email addresses were obtained from the ACGME website (https://apps.acgme.org/ads/Public/Programs/Search, accessed in March 2016). Survey questions consisted of a combination of multiple selection and open-ended questions with data collected from March 1 to June 16, 2016. An initial email was sent in March 2016 with a reminder email sent in June 2016. Survey questions were derived from informally obtained verbal feedback from former interns and current anesthesiology residents regarding the role of mentorship, department orientations, and rotations. Additionally, survey questions on the rotations were shaped by ACGME requirements and feedback from the Intern Year Improvement Committee on intern experiences.

Results

During the three-month survey period, 39 of 130 US anesthesiology residency program directors responded (30%). Of these, five (13%) reported hosting exclusively advanced positions and 34 (87%) reported the inclusion of a categorical base year within the same institution for some or all residents. Fifteen (39%)

continued on next page

continued from previous page

programs offered only categorical programs, and 18 (47%) provided a combination of categorical and advanced positions (Figure 1.1). Programs that offered both categorical and advanced positions contained 67% categorical and 33% advanced positions on average (Figure 1.2) with a wide degree of variation between programs.

The ACGME stipulates in Section IV.A.6b of the anesthesiology residency program requirements including no more than 2 months of critical care and emergency medicine and at least 6 months of inpatient care.[8] These requirements are applicable to intern years spent as part of either advanced or categorical programs. Emergency medicine and anesthesiology (94%) were the most frequently offered CBY rotations among respondents, medical ICU (68%), general surgery (65%), pulmonary medicine (62%), cardiac ICU (62%), medical subspecialty clinics (56%), and surgical ICU (56%) with specific surgical subspecialties were included in less than half (Table 1). Interestingly, one program stated that they did not offer emergency medicine during the intern year, reflecting either an error in selection of rotations or the fact that this rotation may be offered in subsequent years. The ICU requirement for anesthesiology residency training consists of at least 4 months of progressive rotations in critical care, and this is reflected in the emphasis of both surgical and medical ICU rotations in our survey results. Every program listed at least one ICU month in their intern year, whether it was surgical, general medical, or cardiac ICU. Respondents also offered general and anesthesiology-specific rotations in their curriculum that were not specifically queried (Tables 2 and 3).

One of the primary goals of the CBY is to provide rotations that prepare interns for the subsequent years, and the survey queried which rotations addressed this competency. Respondents cited the importance of critical care experience for intraoperative anesthetic management skills and the utility of inpatient medicine wards for the perioperative management of surgical patients with complex medical comorbidities (Table 4). Beyond serving to meet a requirement of anesthesiology residency training, many program directors feel that the critical care exposure in particular has contributed to the residents' preparation for the advanced anesthesiology years,

Many respondents described major changes to the rotations and curriculum of the CBY year (Table 5). These changes have included the addition of nontraditional electives such as a blood bank elective, quality improvement, perioperative surgical home, simulation, pre-anesthetic evaluation clinic, best practices, research projects, and practice management. Several respondents reported moving interns away from general medicine or surgical rotations to medical or surgical subspecialties such as pulmonary medicine or otolaryngology (ENT). Two respondents reported delaying anesthesiology rotations until later in the CBY to avoid poor retention for the start of their formal PGY-2 anesthesiology training.

The survey queried about educational materials provided to interns, which were frequently provided by their residency programs. Examples of materials provided through open-ended comments included introductory anesthesiology textbooks, online and paper preparatory materials, or question banks.

Additionally, the presence of mentorship was asked in the survey. Sixty-five percent of respondents reported that interns received a "one-on-one" or designated faculty preceptor during their anesthesiology rotation. Of those respondents who answered "no," many reported the designation of an assigned senior resident instead of a faculty member. As this was stated in the free-text section and not a survey point, it is difficult to estimate how many respondents had a similar arrangement. One respondent stated that interns were paired with other members of the anesthesiology care team, such as certified registered nurse anesthetists (CRNA), and anesthesia technicians to learn their roles in the operating rooms.

The survey queried about department-specific orientation to the interns, who may not otherwise come in contact with the department or receive a formal introduction and welcome to the administration. Seventy-two percent of respondents reported providing a departmental orientation session. Some of the respondents who answered both "yes" and "no" stated that their interns received a Graduate Medical Education (GME) orientation and hospital orientation upon starting. Again, since this was stated in the free-text section, it is unclear how many respondents had a similar structure. Eighty-nine percent of respondents reported employing a simulation-based curriculum for categorical interns.

Without adequate feedback mechanisms from interns, it is challenging to assess problems regarding the intern year experience. Eighty-five percent of respondents engaged in meetings with their interns, and 65% employed online surveys. Other techniques used included focus groups, interns meeting informally with residents, and intern evaluations of faculty members. Respondents received feedback about interns most commonly through hosting departments' program directors (91%) and much less commonly from chief residents (12%) or online evaluations from faculty working with their interns.

Discussion

This survey provides a glimpse of the relative distribution of categorical and advanced spots offered as part of anesthesiology residency programs in the United States. Limitations of this study include the response rate of 30%, which casts doubt on whether it is representative of the 130 US anesthesiology residency programs. Future work should, in addition to achieving a greater response rate, explore the factors influencing the CBY training structure, including the types of spots offered. With this sample, we have shown some heterogeneity among programs and hope to open the conversation about strategies and barriers to implementation of new strategies.

As mentioned, the ACGME requires no more than 2 months of critical care and emergency medicine and at least 6 months of inpatient care,[8] requirements applicable to intern years spent as part of either advanced or categorical programs. This work has shown that programs have designed CBYs that are often unique to their institutions. It remains unclear why certain structures exist and whether there is a significant impact in long-term educational outcomes. Short-term educational outcomes are important to address, including duty hours, burnout, and work-life balance.[9,10]

The representation of rotations across programs as revealed by this survey reflects both ACGME requirements as well as prioritization of experiences anticipated as meaningful to anesthesiology training and practice. General surgical inpatient rotations were identified by respondents as providing residents with perioperative experience and preparation for the anesthetic management of com-

continued on next page

continued from previous page

plex surgical patients, an additional insight that begs further study. These authors were pleased to see the inclusion of rotations and experiences involving exposure to quality, safety, systems-based practices, the perioperative surgical home, and research. The potential influence of early exposure to such anesthesiology-related issues on the professional trajectory of trainees could yield valuable information to the profession as we look to mold the future leaders of our profession.

Respondents reported a wide array of creating a CBY anesthesiology rotation, including strategies for providing or creating rotation materials, educational offerings, and mentorship. While it may come as no surprise that most programs provide printed or electronic resources such as textbooks, these authors were pleased to see that the majority offered one-on-one mentorship structures and simulation-based educational experiences. A more detailed description of these programs along with data on resident response to them and their potential impact on knowledge and skill acquisition would be beneficial to other programs looking to initiate or improve their CBY anesthesiology experience.

While most respondents reported that interns receive an orientation from their department or the GME staff upon residency training, future surveys could address more specifically the role of an anesthesiology department provided orientation and rationales or benefits for such an orientation in addition to that provided by GME. Furthermore, outcome measures of success during intern year could be measures as a function of exposure to an anesthesiology department's initiated orientation. These authors have introduced an intern orientation delivered by anesthesiology department leadership, chief and junior anesthesiology residents focusing on practical skills, professionalism, and mentorship with the intention of enhancing interns' success over the year. A standardized model could be introduced and its effectiveness as defined by clinical ability, ratings of professionalism, and burnout could be investigated.

Finally, no ideal has been identified regarding feedback mechanisms for and of interns over the course of their initial year of training. While many programs utilize meetings with the anesthesiology residency program director, no clarification was made between individual and group meetings, or scheduled compared to spontaneous meetings. Furthermore, if effective surveys have been identified—or other mechanisms, such as senior resident-led intern year improvement committee meetings—this information would yield great value to program directors nationwide. Again, more objective measures of utility would best address this area of inquiry.

Conclusion

This survey aimed to characterize the prevalence and characteristics of CBYs across US residency training programs with an attempt to better identify rotation structures, characteristics of anesthesiology exposure, strategies for intern orientation, and methods of eliciting feedback. Most of the survey respondents provided categorical or mixed advanced and categorical positions. Almost all survey respondents included the required CBY rotations, including emergency medicine, inpatient floor months, and ICUs. Respondents expressed that rotations such as intensive care, anesthesia month, and pediatric clinics best prepared their interns for the subsequent years. Changes made by respondents to the CBY included more perioperative clinic, simulation, and medical specialty rotations. Additionally, timing of anesthesia month was a factor, with respondents moving it later in the intern year to coincide with the start of CA1. The majority of respondents offered an anesthesia month, mentorship, and a department-specific orientation. Most respondents also provided educational materials and sought feedback from the interns. Future directions include objective assessment of specific interventions in the intern year curriculum and exploring both opportunities and solutions to challenges inherent in the increasing prevalence of the CBY in US anesthesiology residency training programs.

Abbreviations

ACGME: Accreditation Council for Graduate Medical Education

CRNA: Certified Registered Nurse Anesthetist

ENT: Ear, Nose, Throat Surgery

GME: Graduate Medical Education

ICU: Intensive Care Unit

References

1. Woodworth G, Miller Juve A, Swide CE, Maniker R. An innovative approach to avoid reinventing the wheel: the anesthesia education toolbox. *J Grad Med Educ* 2015;7(2):270-271.
2. Alem N, Cohen N, Cannesson M, Kain Z. Transforming perioperative care: the case for a novel curriculum for anesthesiology resident training. *A A Case Rep*. 2016;6(12):373-379.
3. Fraser AB, Stodel EJ, Chaput AJ. Curriculum reform for residency training: competence, change, and opportunities for leadership. *Can J Anaesth* 2016;63(7):875-884.
4. Flanagan MR, Foster CC, Schleyer A, et al. Aligning institutional priorities: engaging house staff in a quality improvement and safety initiative to fulfill Clinical Learning Environment Review objectives and electronic medical record Meaningful Use requirements. *Am J Surg* 2016;211(2):390-397.
5. Mitchell JD, Montealegre-Gallegos M, Mahmood F, et al. Multimodal perioperative ultrasound course for interns allows for enhanced acquisition and retention of skills and knowledge. *A A Case Rep* 2015;5(7):119-123.
6. Chu LF, Ngai LK, Young CA, et al. preparing interns for anesthesiology residency training: development and assessment of the Successful Transition to Anesthesia Residency Training (START) E-learning curriculum. *J Grad Med Educ* 2013;5(1):125-129.
7. Younker TD, Conlay LA, Searle NS, et al. Performance outcomes in anesthesiology residents completing categorical (anesthesia) or advanced (nonspecific) internship training. *Teach Learn Med* 2009;21(1):20-23.
8. ACGME program requirements for graduate medical education in anesthesiology. http://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/040_anesthesiology_2016.pdf. Accessed December 11, 2016.
9. Doolittle BR, Windish DM. Correlation of burnout syndrome with specific coping strategies, behaviors, and spiritual attitudes among interns at Yale University, New Haven, USA. *J Educ Eval Health Prof* 2015;12:41.
10. Campbell J, Prochazka AV, Yamashita T, Gopal R. Predictors of persistent burnout in internal medicine residents: a prospective cohort study. *Acad Med* 2010;85(10):1630-1634.

continued on next page

continued from previous page

Agathe Streiff is a Pediatric Anesthesiology Fellow at the Boston Children's Hospital, 300 Longwood Avenue, Boston, MA, 02115.

Barbara Orlando is Assistant Professor of Anesthesiology in the Department of Anesthesiology, Perioperative Medicine and Pain, Mount Sinai St. Luke's and Mount Sinai West, New York, NY, 10019.

Bryan Mahoney is an Assistant Professor of Anesthesiology and Residency Program Director in the Department of Anesthesiology, Perioperative Medicine and Pain, Mount Sinai St. Luke's and Mount Sinai West, New York, NY, 10019.

Corresponding author: Barbara Orlando, MD, Department of Anesthesiology, Perioperative Medicine and Pain, Mount Sinai St. Luke's and Mount Sinai West, 1000 10th Ave, New York, NY, 10019, Telephone: (212) 523-3975, Fax: (212) 523-3930. Email address: barbara.orlando@mountsinai.org.

Disclosures: In keeping with the policies of the Journal of Education in Perioperative Medicine, this manuscript has not been published or submitted for publication in any part. All listed authors have participated in the planning, implementation, or analysis phases of the work presented including drafting the manuscript. All persons involved in data collection or processing have been listed as authors. The authors hereby transfer, assign, or otherwise convey all copyright ownership to the Journal of Education in Perioperative Medicine effective if and when the submission is accepted for publication.

Conflicts of Interest: None of the above authors have any commercial associations that represent a conflict of interest in connection with the work submitted including consultancies, equity interests, or patent licensing.

Funding Source: No funding was used in supporting this work.

Abstract

Background: To maintain compliance with the current shift towards competency-based milestone assessment in graduate medical education, residency training programs must reflect this emphasis in their curricula starting with the intern year of training.1 In working towards collaborative efforts in curricular development between Accreditation Council for Graduate Medical Education (ACGME) anesthesiology residency programs, understanding the structure and design of the clinical base year for anesthesiology residency programs nationwide will serve as a valuable initial step.

Methods: Anonymous online surveys were sent to anesthesiology residency program directors to collect data regarding their program's anesthesiology clinical base year (CBY) required, elective, and novel rotations. The survey was also designed to characterize the educational resources provided by the department, changes in the design of the clinical base year, and the feedback received from interns or other rotation department heads.

Results: Thirty-nine out of 130 US anesthesiology residency program directors responded (30%). The majority of respondents (87%) provide an in-house categorical intern CBY with a majority of those (94%) including a month dedicated to anesthesiology, during which some form of mentorship by anesthesiology faculty or senior house staff was provided. The majority of respondents with anesthesiology exposure stated that they provide educational resources such as textbook materials (82%) or simulation sessions (89%) to their residents.

Conclusions: With the evolution of the role of the anesthesiologist, advancements in biotechnology, and newly created board examinations, it is imperative that the CBY prepares rising anesthesiology residents to meet these demands. Results from this survey study can serve as the initial step in improving the clinical base year structure for anesthesiology residents nationally. Collaborative efforts can be undertaken to better incorporate clinical competency, feedback mechanisms, and educational tools through the collection of experiential evidence of successful strategies as well as challenges faced by program directors nationwide.

Key Words: graduate medical education, program director, anesthesiology residency, categorical year, intern year, mentorship, curriculum.

continued on next page

Appendix

Survey Sent to Participants

Question 1.
Do you have an internship year/categorical clinical base year set up as part of your anesthesia residency at your institution?

(Yes/No) If you are an advanced-only program, please end the survey.

Question 2. (For programs with categorical years)
How many positions of each categorical and advanced do you have?

(Categorical:__ Advanced:__)

Question 3.
Which of the following rotations are the interns exposed to?

(Select any or all of the following: colorectal surgery, vascular surgery, trauma surgery, ear nose throat surgery, surgical intensive care unit, medicine subspecialty clinics, cardiac intensive care unit, pulmonary elective, general surgery, medical intensive care unit, anesthesiology elective, emergency medicine rotation)

Question 4.
In your opinion and experience, which rotations above prepare your residents well for their advanced years?

Please describe. (open-ended response)

Question 5.
Over the past five years, what novel and useful changes to your categorical intern year have been made?

(open-ended response)

Question 6.
Does your program offer an anesthesia month during the CA0 year?

(Yes/No)

Question 7.
If yes, do you provide materials (readings, workbooks, etc.) for interns rotating in anesthesia?

(open-ended response)

Question 8.
Do you provide 1:1 faculty preceptorship during this month? If no, please describe below.

(Yes/No/free text)

Question 9.
Do you provide orientation for the interns? Please describe.

(Yes/No/free text)

Question 10.
Which of the following mechanisms do you use to solicit feedback from your interns regarding the intern year?

(Select any or all of the following: online surveys, meetings with program leadership, none, other)

Question 11.
Do you provide simulation-based educational activities for your interns? If yes, please describe.

(Yes/No/free text)

Question 12.
How do you communicate with the other departments through which your interns rotate to discuss matters such as providing intern feedback of rotations or receiving feedback regarding interns?

(Select any or all of the following: outside department program directors, outside department chief residents, other)

continued on next page

Figures

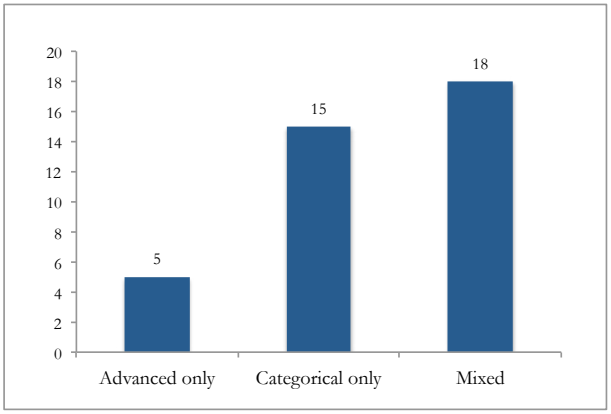

Figure 1.1. *Percentage of Advanced only, Categorical only, and Mixed programs amongst respondents.*

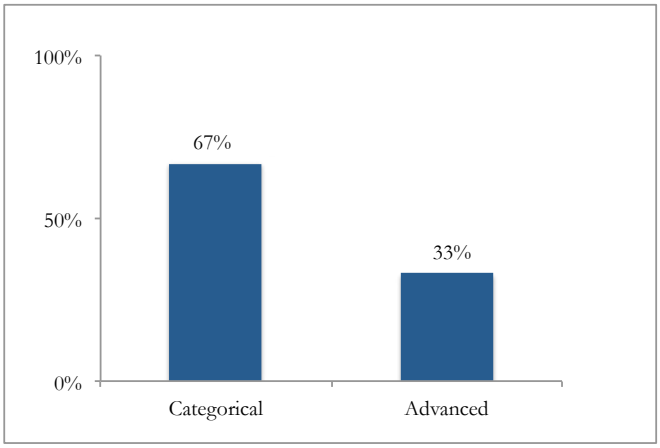

Figure 1.2. *Percentage of categorical and advanced positions among the mixed residency programs.*

Tables

Table 1. Representation of CBY Rotations Among Survey Respondents During Their Intern Year

Rotation	Programs that offered the rotation (%)
Anesthesiology	94
Emergency Medicine	94
Medical Intensive Care Unit (MICU)	68
General Surgery	65
Cardiac Intensive Care Unit (CICU)	62
Pulmonary	62
Medical Subspecialty Clinics	56
Surgical Intensive Care Unit (SICU)	56
Ear, Nose, Throat Surgery (ENT)	44
Trauma Surgery	29
Vascular Surgery	26
Colorectal Surgery	21

continued on next page

Tables *continued*

Table 2. General Rotations Described by Survey Respondents Not Specifically Queried as Part of the Survey

General Rotations Offered by Respondents Not Specifically Queried
Cardiology
Dermatology
Neurosurgical Intensive Care Unit (NSICU)
Palliative Care Medicine
Pediatric Intensive Care Unit (PICU)
Pediatric Medicine
Radiology
Transfusion Medicine
Urology

Table 3. Anesthesiology-Specfic Rotations Described by Survey Respondents Not Specifically Queried as Part of the Survey

Anesthesiology-Specific Rotations Offered by Respondents Not Specifically Queried
Acute Pain Management
Anesthesiology Research
Perioperative Surgical Home
Practice Management
Preadmission Testing Clinic
Quality and Safety Teaching

continued on next page

Tables *continued*

Table 4: Selected Responses of Program Directors Regarding the Rotations That Prepared CBY Residents Well for the Later Years

"In your opinion and experience, which rotations above prepare your residents well for their advanced years? Please describe." – A selection of open-ended responses
"Critical care naturally has direct impact on a new anesthesia resident. I also feel that the pediatric urgent clinic is a good chance to evaluate young children with respiratory problems before being exposed in the OR to it."
"IM, CCU. They come in with a solid foundation of medicine and cardiology. This is essential for the comprehensive care and management of our increasingly sick patient population."
"We believe that all of the rotations prepare our residents for their advanced years."
"The critical care and anesthesia months best prepare our residents."
"[The] extensive pediatric experience helps with peds anesthesia rotations, medical floors provides good basic medical background knowledge."
"Definitely our ICU months. [CBY interns] . . . work with anesthesia personnel and get some procedural exposure as well."

continued on next page

Tables *continued*

1

Table 5: Selected Responses of Program Directors Regarding the Changes Made to the Intern Year Curriculum

"Over the past five years, what novel and useful changes to your categorical intern year have been made?" – A selection of open-ended responses
"An intern year with half surgery/half medicine time. They get to know all departments within the hospital well. "
"Incorporating time in the Blood Bank as well as introduction to QI."
"PSH/US, practice management."
"Required monthly education session of all interns with Intern Anesthesiology Program Director and Chief residents. Various topics and learning activities."
"Added an ENT and Infectious Disease rotations; this past year replaced the ID rotation with a Nephrology rotation; in addition, we have moved our one month of Anesthesia to the last 2 months of the intern year to optimize its educational value towards the pending CA1 year."
"Adding anesthesia lectures two times a week. Adding medical subspecialty rotations like pulmonology, cardiology, neurology, and research rotation."
"We will begin a practice management month the 2016–17 year that will include simulation, quality, best-practice, and management lectures and projects."
"Simulation, Preanesthetic evaluation."
"Buddy program with senior Anesthesia residents; invite interns to Anesthesia department events."
"Ultrasound and blood bank rotation. Currently adding Perioperative Surgical Home components."
"The medicine department functions on a 'plus-one' system, meaning that rotations are 4 weeks, but the year is divided into 5-week blocks. The 5th week is for the categorical IM residents to go to clinic; our anesthesia interns come to us to do anesthesia for a week. This works very well."
"Pediatric floor rotation (heme/onc) which has wonderful teachers."
"QRST . . . airway workshop, bronch workshop, simulation."

2