

# Adult interventional pulmonary practice in Portugal before and after COVID

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### ABSTRACT

Information on the use of bronchoscopy in adults in Portugal is lacking. Our goal was to gain a general understanding of the traits, resources, methods, and behaviors in national interventional pulmonology (IP) facilities both before and after the SARS-CoV-2 outbreak. An expert panel created an online survey that included

information on each unit's physical space, equipment, personnel, procedure planning, monitoring, technical differentiation, and numbers before and after COVID. To take part, interventional pulmonology centers were contacted.

**Key Words:** *Bronchoscopy; pleural disease; interventional pulmonology; Covid.*

### INTRODUCTION

With the advancement of technologies and procedures over the past 20 years, bronchoscopy and interventional pulmonary medicine (IP) have undergone tremendous change. Despite the fact that there are a number of guidelines from international associations and institutions, the majority are recommendations made by experts in this field and are more concerned with safety and functionality than they are with solid scientific evidence, which means that procedures are frequently not standardized. Numerous nations conducted nationwide surveys to assess the accessibility of resources, the clinical application of techniques, and their particularities in light of the current variety of approaches and the limited knowledge regarding bronchoscopy practices. An evaluation of the usage of pleuroscopy in Portuguese pulmonology departments, specifically, was published at the national level, taking into account the procedure's availability, experts' training, experience, and number of procedures, as well as the procedures' specifics. The Portuguese Pulmonology Society recently released a consensus statement about the safety of patients, medical professionals, and other healthcare workers during bronchoscopy and pleural procedures in response to the Coronavirus Disease 2019 (COVID-19) pandemic outbreak. The severe acute respiratory syndrome coronavirus-2 should be assumed to be present in all patients, so specific precautions must be taken, including addressing organizational issues, preparing the physical environment and materials, and ensuring that all professionals involved are wearing

personal protection equipment (PPE). The Committee on Endoscopic Techniques of the Portuguese Pulmonology Society designated a working group to carry out a national survey in order to accurately characterize the Portuguese landscape because it was anticipated that these recent developments in the field of Bronchology would have a significant impact on national interventional pulmonology units. With regard to the Portuguese Pulmonology Departments' technological and human resources, the particulars of the bronchoscopy operations carried out, and a comparison of the situation before and after the COVID-19 pandemic, this survey's objectives were more focused. The Bronchology Units or Pulmonology Departments of all Portuguese public hospitals as well as some private institutions/hospitals were emailed the link to the structured questionnaire that the expert panel created in Google Forms. One reminder was issued to everyone who responded, and those who did not respond were subsequently contacted by phone. Respondents had one month to respond and deliver the full form. The survey included questions with either quantitative or multiple choice answers that took into account the following aspects. Identification of the respondent and the hospital; description of the Interventional Pulmonology Unit; staff experience in bronchoscopy; nursing and anesthesiology support; characterization of the equipment

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-ment planning and monitoring of the bronchoscopy procedures, including procedure specifications (e.g., complementary diagnostic tests before bronchoscopy, sedation techniques, and patient monitoring); endoscopist personal protective equipment (PPE) prior to and following the emergence of the COVID-19 pandemic; Excel spreadsheets with the responses were downloaded.

The statistical package SPSSv24 was used to conduct descriptive analysis the majority of participants said that when the primary goal is to examine the airways and collect samples without the need for biopsies, they often request at least one pre-procedural evaluation to assess each patient who would be subjected to a standard flexible bronchoscopy. Similarly to this, when sedation or biopsies are anticipated, most proceduralists demand many complimentary pre-procedure exams. Explains the additional tests that were asked in each circumstance. Responders confirmed that supplemental oxygen has been given on a regular basis ever since the start of each flexible bronchoscopy. As a result of peripheral oxygen desaturation during the surgery, the eight remaining participants preferred to only provide supplemental oxygen when necessary.

All participants mentioned monitoring heart rate and pulse oximetry throughout flexible bronchoscopy without severe sedation when questioned about the patient's care. Respondents were asked to measure their non-invasive blood pressure, and participants were asked to keep an eye on their ECGs. When deep sedation was intended, participants evaluated end-tidal CO<sub>2</sub>, performed monitor ECGs, took non-invasive blood pressure readings, and directed all replies to monitor heart rate and pulse oximetry. One respondent added clinical observation in one instance and external pacemaker monitoring in the other. All participant units used biopsy forceps as well as bronchial brushings and needle aspiration for the flexible bronchoscopy diagnosis of central/tracheobronchial lesions. Seven individuals noted bronchial cry biopsies. Six respondents reported using cry biopsies, which were the least often reported method for diagnosing peripheral lung abnormalities. Participants in both cases reported that peripheral biopsy forceps and brushing were two of the most popular methods for diagnosing peripheral lesions. The guidance for distant procedures and centers was provided by radial EBUS and fluoroscopy, respectively. According to all centers, Broncho alveolar lavage was the technique of choice for diffuse lung disorders. The subjects underwent Tran's bronchial forceps biopsies, and eight sites reported Tran's bronchial lung cry biopsies. Seven centers (18.9%) used fluoroscopy to direct supplementary procedures for the diagnosis of diffuse lung disorders. Non-guided Transbronchial needle aspiration (TBNA) was employed by centers for the diagnosis of mediastinal lesions. Centers, however, utilized EUS-B-FNA and EBUS-TBNA, respectively. Regarding therapeutic methods, hospitals said they used flexible bronchoscopy to remove foreign objects. Centers attempted to control hemoptysis using balloon tamponade, whereas units used some type of thermal energy, of which LASER was preferred, followed by argon plasma coagulation, which was used by centers. Centers have documented the permeabilization of airways caused by self-expandable stents implanted using flexible bronchoscopy. No center reported the use of another end bronchial therapeutic techniques such as bronchial

thermoplastic or bronchoscopy lung volume reduction (with one-way valves, coils, or thermal ablation). All units acknowledged using single-use face masks (four in addition to a surgical face mask), some type of eye protection, a single-use gown, and single-use waterproof gloves when questioned about the PPE they currently employ during interventional bronchoscopy. Outlines the common PPE that was reportedly utilized both before and after the outbreak. According to this survey, bronchoscopy procedures and resources vary noticeably among adult IP units in the mainland of Portugal. This was a thorough and extensive questionnaire that allowed for the evaluation of COVID-19's nationwide influence and the prevalence of the practice in the nation. Since the 1990s, surveys in IP have been released. When compared to earlier questionnaires that may describe the clinical landscape of bronchoscopy in North America and several European nations, a lot has changed in terms of practice and technological advancements. The frequency and rationale for hard bronchoscopies have decreased, new procedures (such as EBUS and cry biopsies) have been developed, and sedation and anesthesia are now expected in most units and requested by patients.

The survey's response rate was very high, and the results show the national landscape, which is dominated by the metropolitan areas of Lisbon and Porto and the coastline region, where more than half of Portugal's population resides. More than two or more trained pulmonologists work in the majority of bronchoscopy-only units, and in some situations, at least one of them has at least ten years of IP experience. In contrast, most units only have two nurses or fewer, and the majority of them do not exclusively focus on bronchoscopy. It is important to note that there is no post-graduate IP education specifically for nurses in this nation. We might surmise that the exam quality may be impacted by the lack of nurses who are trained in and dedicated to this field. The British Thoracic Society recommended having at least two licensed nurses present when having a bronchoscopy. While a third nurse is required to assist the anesthesiologist during procedures carried out under deep sedation or general anesthesia, the European Respiratory Society and the American Thoracic Society instruct on the need for one to two dedicated nurses during interventional pulmonology procedures performed without anesthesia. In order to comply with worldwide norms and demand the regular presence of an acceptable number of trained nurses, efforts should be taken to ensure that nursing staff obtains adequate standard IP training. Depending on how many units are involved in the workflow, this figure may change. But in low-volume units, it should not be fewer than two (perhaps rotating), and in high-volume units that perform sophisticated interventional bronchoscopy, it should be at least three (non-rotating). The technological capabilities and equipment used by IP units vary greatly, with more than half conducting only the most fundamental tests. According to the population, a third uses rigid bronchoscopy, which is adequate for the needs of the nation. According to the Survey of Pulmonology Services, which was created as part of the evaluation of the Pulmonology Referral Network, centers performed linear EBUS, whereas just six did it. Since EBUS is a crucial tool for identifying benign or malignant lesions close to the tracheobronchial tree or the esophagus, as well as for mediastinal staging in patients with lung cancer, its expansion follows the natural progression of IP units around the world. Radial EBUS, 10 fluoroscopies, and two electromagnetic navigation systems are available for the identification

of peripheral pulmonary nodules, increasing diagnostic precision. One-use bronchoscopes, which were not frequently used, are now available in some of the units because to the COVID-19 outbreak. The advantages of this equipment in terms of the risk of contamination, availability, and preserved efficacy in the majority of emergent clinical circumstances will undoubtedly lead to an increase in its use in the near future. In terms of annual procedures, the current data clearly demonstrates the detrimental effects of the COVID-19 pandemic period, with a decline in both the average number of flexible and rigid bronchoscopies. This is consistent with other studies that have been reported, where the workload for IP procedures significantly lowered or was even eliminated during the COVID-19 era. It is necessary to use some form of anesthetic or sedation to lessen patient discomfort, increase operation safety, shorten process time, and improve diagnostic precision. For bronchoscopy diagnostic procedures, conscious sedation with anti-anxiety and/or analgesic drugs, along with local anesthetic, titrated by bronchoscopy- and monitored by the team, is preferred. Since it lessens cough and pain, increases patients' tolerance, and lowers the overall dose of sedative medications, most guidelines advise combining a sedative agent with an opioid. More IP units in the nation than ever before confirmed the use of midazolam in the present assessment. However, only an opioid was associated, most likely because of limited expertise with this drug and concern for consequences in individuals with a history of respiratory disorders. Conscious sedation has its limitations, and prolonged, intricate, and technically challenging bronchoscopies or therapeutic operations typically call for general anesthesia and deeper sedation with the assistance of an anesthesiologist who is not involved in the intervention itself. The survey noted the scarcity of anesthesiologists as a potential issue, with only and of the units regularly or consistently interacting with this specialty. Even when there is no history of bad coagulation or cardiac risk, almost all responders typically request a full blood count, coagulation testing, renal function, and an electrocardiogram as pre-procedural prerequisites. If we compare these figures to other published surveys, they are far higher.