A survey of flexible bronchoscopy practices in India: The Indian bronchoscopy survey (2017)

Karan Madan, Anant Mohan, Ritesh Agarwal¹, Vijay Hadda, Gopi C Khilnani, Randeep Guleria

Department of Pulmonary Medicine and Sleep Disorders, All India Institute of Medical Sciences, New Delhi, ¹Department of Pulmonary Medicine, Postgraduate Institute of Medical Education and Research, Chandigarh, India

ABSTRACT

Background: There is a lack of contemporaneous data on the practices of flexible bronchoscopy in India. Aim: The aim of the study was to study the prevalent practices of flexible bronchoscopy across India. Methods: The "Indian Bronchoscopy Survey" was a 98-question, online survey structured into the following sections: general information, patient preparation and monitoring, sedation and topical anesthesia, procedural/technical aspects, and bronchoscope disinfection/staff protection. Results: Responses from 669 bronchoscopists (mean age: 40.2 years, 91.8% adult pulmonologists) were available for analysis. Approximately, 70,000 flexible bronchoscopy examinations had been performed over the preceding year. A majority (59%) of bronchoscopists were performing bronchoscopy without sedation. A large number (45%) of bronchoscopists had learned the procedure outside of their fellowship training. About 55% used anticholinergic premedication either as a routine or occasionally. Nebulized lignocaine was being used by 72%, while 24% utilized transtracheal administration of lignocaine. The most commonly (75%) used concentration of lignocaine was 2%. Midazolam with or without fentanyl was the preferred agent for intravenous sedation. The use of video bronchoscope was common (80.8%). The most common (94%) route for performing bronchoscopy was nasal. Conventional transbronchial needle aspiration (TBNA) was being performed by 74%, while 92% and 78% performed endobronchial and transbronchial lung biopsy, respectively. Therapeutic airway interventions (stents, electrocautery, cryotherapy, and others) were being performed by 30%, while endobronchial ultrasound guided transbronchial needle aspiration (EBUS-TBNA) and rigid bronchoscopy were performed by 27% and 19.5%, respectively. Conclusion: There is a wide national variation in the practices of performing flexible bronchoscopy. However, there has been a considerable improvement in bronchoscopy practices compared to previous national surveys.

KEY WORDS: Anesthesia, bronchoscopy, endobronchial ultrasound, lung biopsy, transbronchial needle aspiration

Address for correspondence: Dr. Karan Madan, Department of Pulmonary Medicine and Sleep Disorders, All India Institute of Medical Sciences, Ansari Nagar, New Delhi - 110 029, India. E-mail: drkaranmadan@gmail.com

INTRODUCTION

Although flexible bronchoscopy was introduced into pulmonology almost 50 years ago,^[1] its practice and procedural aspects are yet not standardized. The paucity of technical aspects of bronchoscopy in major bronchoscopy guidelines contributes to local and international differences in practice of

Access this article online				
Quick Response Code:	Website: www.lungindia.com			
	DOI: 10.4103/lungindia.lungindia_417_17			

bronchoscopy.^[2] This is highlighted by comparing the findings of a few recently published bronchoscopy surveys.^[3,4] Consequently, the practice of bronchoscopy varies, depending on the physician preferences and the availability of resources. The practice is mostly dependent on the skills being passed on from the

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Madan K, Mohan A, Agarwal R, Hadda V, Khilnani GC, Guleria R. A survey of flexible bronchoscopy practices in India: The Indian bronchoscopy survey (2017). Lung India 2018;35:98-107.

preceptor to the trainee, without any systematic teaching and learning methodology.

There exists a significant variation in the methods pertaining to performance of flexible bronchoscopy across India. This was highlighted 12 years ago in a bronchoscopy survey from India (including 149 respondents), akin to the bronchoscopy surveys conducted in other countries.^[5-11] The "Indian Bronchoscopy Survey" was planned to study the existing practices of flexible bronchoscopy across the country and compare the prevalent practices with bronchoscopy surveys conducted in other countries. Herein, we report the results of this survey.

METHODS

The "Indian Bronchoscopy Survey" was an online survey conceptualized and designed in the Department of Pulmonary Medicine and Sleep Disorders at the All India Institute of Medical Sciences, New Delhi. The survey included 98 questions [Supplemental File 1], prepared in the English language. The responses were anonymous; no names or personal details including E-mails were required from the respondents. The survey was developed on the "Google Forms" interface. Google Forms is a free-to-use data capturing interface by "Google" that allows easy conduct of surveys.^[12] The survey form was structured and divided into various sections that included general information, patient preparation and monitoring, sedation and topical anesthesia, procedural/technical aspects, and bronchoscope disinfection/staff protection. The questions were of either a descriptive response type or multiple option type. The option type questions either had a "Yes/No" response or option for multiple responses. As various procedures are not consistently performed at all the times, options for many questions were specified as "always, most of the times, sometimes, and never," wherever considered appropriate. Several questions had an option for the respondent to provide additional information if none of the options matched the operator's practice. A trial run was performed wherein the authors responded to the survey themselves and identified areas that needed refinement. The e-mail lists of the three major national bodies of pulmonologists and bronchoscopists were utilized. These included the Indian Association for Bronchology, the Indian Chest Society, and the National College of Chest Physicians of India. As many pulmonologists are members of more than one of these societies, it is likely that many participants received more than one e-mails initially. In addition, e-mails were also sent from personal e-mailing lists of the authors.

The survey protocol was finalized in mid-October 2016 and the first survey e-mail was sent on October 31, 2016. All e-mails were sent within the next 1 week and a reminder e-mail was sent a month later. It was decided to keep the survey link open for the next 3 months to gather the responses. The participation in the survey was voluntary and no financial incentive was offered to the participants for responding.

Statistical analysis

Responses were downloaded as an excel spreadsheet. Responses from only those who were performing bronchoscopy were included in the study. Descriptive statistical analysis was performed using STATA Statistical analysis package (Version 11.2), StataCorp LLC, Texas, USA. Categorical variables were presented as number (percentages) and continuous variables were presented as mean (standard deviation) or median (interquartile range [IQR]).

RESULTS

We received 701 responses, of which 669 respondents were performing flexible bronchoscopy and were included in the study. Majority (75%) of the responses were obtained within the first 3 weeks of the initiation of the survey. Approximately 66,900 bronchoscopies were performed over the preceding 1 year (median 100 procedures/ physician/year; IQR, 40–200). We received responses from 155 cities; however, nearly half (313 of the 669 [46.8%]) were from ten cities: Delhi (n = 98), Mumbai (n = 37), Bengaluru (n = 37), Hyderabad (n = 34), Kolkata (n = 22), Chandigarh (n = 19), Bhopal (n = 15), Chennai (n = 14), Jaipur (n = 14), and Coimbatore (n = 13).

General information

The respondents were predominantly adult pulmonologists (91.8%), mostly male (86.7%), with a mean age of 40.2 years [Table 1]. Most were working in nongovernmental multispecialty hospitals (38.5%) or as teaching faculty in medical colleges (31.1%). About 27.8% were performing bronchoscopy in children younger than 12 years of age. Most (80.8%) were using the video bronchoscopy equipment. A large number (45.1%) had learned bronchoscopy outside their fellowship training. Bronchoscopy was being performed for 5 years or more by 57.5%. A median of two assistants (IQR, 1-5) was available during the procedure, and a bronchoscopy suite/room was the most commonly utilized area (79.8%) for performing the procedure. Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) was being performed by 26.9%, while 19.5% and 14.2% performed rigid bronchoscopy and radial EBUS, respectively.

Patient preparation and monitoring details

The patient preparation and monitoring details are summarized in Tables 2 and 3. A written informed consent was regularly being obtained by 91.7%. A majority (97.7%) kept the patient fasting before the procedure, of which 72.7% fasted patients for 4–8 h prior. Blood pressure was recorded by 79.4% at the time of scheduling patients for bronchoscopy. An intravenous access was routinely secured by 80%, while 39.1% routinely performed electrocardiogram monitoring during flexible bronchoscopy. Almost all (99.4%) were using pulse oximetry during the procedure and 73% monitored blood pressure during the procedure. Supplemental oxygen was continuously administered during the procedure

ItemResponseTotal number or respondents (n)701Age (years), mean (SD)40.2 (9.85)Male gender (%)578 (86.7)Performing flexible bronchoscopy (n)*669Performing radial EBUS-TBNA (%)173 (26.9)Performing radial EBUS (%)89 (14.2)Performing radial EBUS (%)27.8Area of specialization (%)711Pulmonologist (adult patients)614 (91.8)Critical care physician (adult)18 (2.7)Anesthesiologist13 (1.9)Thoracic surgeon9 (1.4)Pulmonologist (pediatric)7 (1)General physician (pediatric)1 (0.15)Duration since performing bronchoscopy (%)1.0.15)Less than a year5.41-3 years19.53-5 years17.65-10 years22.4>-10 years35.1Bronchoscopy examinations performed over last 1 year, median (1QR)100 (40-200)Private practitioner (multispecialty hospital)38.5Others4.5Mode of learning bronchoscopy (%)2.9Others4.5Mode of learning bronchoscopy (%)1.0Working under someone performing bronchoscopy45.1Training program outside India Others6.8Others1.6Type of flexible bronchoscope (%)7.2Working under someone performing bronchoscopy45.1Postgraduate trainee5.3DM fellow2.9Others0.2Piber-optic bronchoscope37.2	Table 1: Baseline characteristics of the survey respondents			
Age (years), mean (SD)40.2 (9.85)Male gender (%)578 (86.7)Performing flexible bronchoscopy (n)*669Performing rigid BUS (%)173 (26.9)Performing rigid bronchoscopy (%)127 (19.5)Performing rigid bronchoscopy (%)27.8Area of specialization (%)13 (1.9)Pulmonologist (adult patients)614 (91.8)Critical care physician (adult)18 (2.7)Anesthesiologist10 (0.15)Critical care physician (pediatric)7 (1)General physician6 (0.9)Otorhinolaryngologist11 (0.15)Critical care physician (pediatric)1 (0.15)Duration since performing bronchoscopy (%)12.4Less than a year5.41-3 years19.53-5 years17.65-10 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year, low area private practitioner (multispecialty hospital)38.5Traching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (ultispecialty hospital)35.2Self-learned11.3Training program outside India6.8Others4.5Mode of learning bronchoscopy (%)45.1Working under someone performing bronchoscopy45.1Training program outside India6.8Others1.6Type of flexible bronchoscopy9.0Both43.6Nota ware of the type0.2Place of performing f				
Male gender (%)578 (86.7)Performing flexible bronchoscopy (n)*669Performing radial EBUS (%)89 (14.2)Performing rigid bronchoscopy (%)127 (19.5)Performing pediatric bronchoscopy (%)27.8Area of specialization (%)18 (2.7)Pulmonologist (adult patients)614 (91.8)Critical care physician (adult)18 (2.7)Anesthesiologist7 (1)General physician (adult)18 (2.7)Pulmonologist (pediatric)7 (1)General physician (pediatric)1 (0.15)Critical care physician (pediatric)1 (0.15)Critical care physician (pediatric)1 (0.15)Critical care physician (pediatric)1 (0.15)Duration since performing bronchoscopy (%)100 (40-200)Less than a year5.41-3 years100 (40-200)median (IQR)100 (40-200)Place of work/designation (%)7.1Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)4.5Working under someone performing bronchoscopy45.1Training program within India5.2Self-learned1.3Training program within India6.8Others0.6Nota ware of the type0.2Pilace of performing f	Total number or respondents (<i>n</i>)	701		
Performing flexible bronchoscopy (n)*669Performing EBUS-TBNA (%)173 (26.9)Performing rigid bronchoscopy (%)127 (19.5)Performing rigid bronchoscopy * (%)27.8Area of specialization (%)18 (2.7)Anes desicalization (%)18 (2.7)Anesthesiologist13 (1.9)Thoracic surgeon9 (1.4)Pulmonologist (pediatric)7 (1)General physician6 (0.9)Otorhinolaryngologist1 (0.15)Critical care physician (pediatric)1 (0.15)Duration since performing bronchoscopy (%)12.4Less than a year5.41-3 years19.53-5 years17.65-10 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year, median (IQR)100 (40-200)Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (ultispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (ultispecialty hospital)38.5Teaching bronchoscopy (%)4.5Mode of learning bronchoscopy (%)4.5Working under someone performing bronchoscopy45.1Training program outside India6.8Others0.2Place of performing flexible bronchoscopy7.2Fiber-optic bronchoscope7.2Piber-optic bronchoscope <t< td=""><td></td><td>40.2 (9.85)</td></t<>		40.2 (9.85)		
Performing EBUS-TBNA (%)173 (26.9)Performing raidal EBUS (%)89 (14.2)Performing regid bronchoscopy *(%)27.8Area of specialization (%)18 (2.7)Pulmonologist (adult patients)614 (91.8)Critical care physician (adult)18 (2.7)Anesthesiologist13 (1.9)Thoracic surgeon9 (1.4)Pulmonologist (pediatric)7 (1)General physician (adult)10.15)Critical care physician (pediatric)1 (0.15)Ottrition since performing bronchoscopy (%)10.15)Less than a year5.41-3 years19.53-5 years17.65-10 years35.1Bronchoscopy examinations performed over last 1 year, Place of work/designation (%)100 (40-200)Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training Post-MD or equivalent training Post-MD or equivalent training Training program within India 35.235.2Self-learned1.3Training program within India Araining program within India Araining norgram within India Araining norgram within India Araining norgram within India Araining program outside India Others644 (97.0)Pilace of performing flexible bronchoscopy examinations (%)72.2Bronchoscopy room0.6Others0.7Number of assistants during procedure, median (IQR) Diagnostic and thera				
Performing radial EBUS (%)89 (14.2)Performing rigid bronchoscopy (%)127 (19.5)Performing pediatric bronchoscopy (%)27.8Area of specialization (%)18 (2.7)Pulmonologist (adult patients)614 (91.8)Critical care physician (adult)18 (2.7)Anesttlesiologist7 (1)General physician6 (0.9)Otorhinolaryngologist1 (0.15)Critical care physician (pediatric)1 (0.15)Duration Since performing bronchoscopy (%)1Less than a year5.41-3 years19.53-5 years17.65-10 years22.4>10 years22.4>10 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year, median (10R)100 (40-200)Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)Working under someone performing bronchoscopyWorking under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program within India35.2Self-learned11.7Video bronchoscope37.2Fiber-optic bronchoscope (%)72.8Not aware of the type0.2Place of performing flexible bronchoscopy535 (80.5)Wideo someone performing bronchoscopy21.5	Performing flexible bronchoscopy $(n)^*$			
Performing rigid bronchoscopy (%)127 (19.5)Performing pediatric bronchoscopy* (%)27.8Area of specialization (%)27.8Pulmonologist (adult patients)614 (91.8)Critical care physician (adult)18 (2.7)Anesthesiologist13 (1.9)Thoracic surgeon9 (1.4)Pulmonologist (pediatric)7 (1)General physician6 (0.9)Otorhinolaryngologist1 (0.15)Critical care physician (pediatric)1 (0.15)Duration since performing bronchoscopy (%)Less than a yearLess than a year5.41-3 years19.53-5 years22.4>10 years22.4>10 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year,100 (40-200)median (IQR)11.1Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)4.5Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned1.6Type of flexible bronchoscope37.2Fiber-optic bronchoscope (%)72.8Video bronchoscope (%)72.8Dorters0.7Palee of performing flexible bronchoscopy72.1				
Performing pediatric bronchoscopy* (%)27.8Area of specialization (%)614 (91.8)Pulmonologist (dult patients)614 (91.8)Critical care physician (adult)13 (1.9)Thoracic surgeon9 (1.4)Pulmonologist (pediatric)7 (1)General physician (adult)10 (0.15)Critical care physician (pediatric)1 (0.15)Diration since performing bronchoscopy (%)10 (0.15)Less than a year5.41-3 years19.53-5 years17.65-10 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year, median (IQR)100 (40-200)Place of work/designation (%)7.7Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (elinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)45.1Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others0.2Place of performing flexible bronchoscopy37.2Fiber-optic bronchoscope (%)1.7Video bronchoscope37.2Fiber-optic bronchoscope (%)0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications (%)1.7 </td <td></td> <td></td>				
Area of specialization (%)614 (91.8)Pulmonologist (adult patients)614 (91.8)Critical care physician (adult)18 (2.7)Anesthesiologist13 (1.9)Thoracic surgeon9 (1.4)Pulmonologist (pediatric)7 (1)General physician6 (0.9)Otorhinolaryngologist1 (0.15)Critical care physician (pediatric)1 (0.15)Duration since performing bronchoscopy (%)1Less than a year5.41-3 years19.53-5 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year, median (IQR)100 (40-200)Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)4.5Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others0.2Place of performing flexible bronchoscopy2.2Video bronchoscope37.2Fiber-optic bronchoscope37.2Fiber-optic bronchoscope0.2Place of performing flexible bronchoscopy2.1Training program within India35.6Sold0.2Place of performing flexible bronchos				
Pulmonologist (adult patients)614 (91.8)Critical care physician (adult)18 (2.7)Anesthesiologist13 (1.9)Thoracic surgeon9 (1.4)Pulmonologist (pediatric)7 (1)General physician6 (0.9)Otorhinolaryngologist1 (0.15)Critical care physician (pediatric)1 (0.15)Duration since performing bronchoscopy (%)1Less than a year5.41-3 years19.53-5 years17.65-10 years22.4> 20 years35.1Bronchoscopy examinations performed over last 1 year, median (IQR)100 (40-200)Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)45.1Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others0.2Place of performing flexible bronchoscopy7.2Fiber-optic bronchoscope97.2Fiber-optic bronchoscope0.7Number of assistants during procedure, median (IQR)0.6Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during p		27.8		
Critical care physician (adult)18 (2.7)Anesthesiologist13 (1.9)Thoracic surgeon9 (1.4)Pulmonologist (pediatric)7 (1)General physician6 (0.9)Otorhinolaryngologist1 (0.15)Critical care physician (pediatric)1 (0.15)Duration since performing bronchoscopy (%)1Less than a year5.41-3 years19.53-5 years17.65-10 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year,100 (40-200)median (IQR)88.5Place of work/designation (%)7.7Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)45.1Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)7.2Video bronchoscope9.7.2Fiber-optic bronchoscope0.2Place of performing flexible bronchoscopy (%)0.2Bronchoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2.(1-5)Indications for flexible		(11(01))		
Anesthesiologist13 (1.9)Thoracic surgeon9 (1.4)Pulmonologist (pediatric)7 (1)General physician6 (0.9)Otorhinolaryngologist1 (0.15)Duration since performing bronchoscopy (%)1Less than a year5.41-3 years19.53-5 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year,100 (40-200)median (IQR)12.0Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)45.1Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Nye of flexible bronchoscope (%)7.2Video bronchoscope37.2Fiber-optic bronchoscope (%)0.2Place of performing flexible bronchoscopy (%)0.7Number of assistants during procedure, median (IQR)0.6Others0.7Number of assistants during procedure, median (IQR)644 (97.0)Indications for flexible bronchoscopy (%)535 (80.5)Diagnostic and therapeutic bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biop				
Thoracic surgeon9 (1.4)Pulmonologist (pediatric)7 (1)General physician6 (0.9)Otorhinolaryngologist1 (0.15)Critical care physician (pediatric)1 (0.15)Duration since performing bronchoscopy (%)1Less than a year5.41-3 years19.53-5 years17.65-10 years22.4> 20 years35.1Bronchoscopy examinations performed over last 1 year, Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (multispecialty hospital)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)4.5Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)7.2Video bronchoscope (%)7.2Piber-optic bronchoscope (%)7.2Piber-optic bronchoscope (%)7.2Endoscopy room7.8Operation theater1.7I.71.7Indications for flexible bronchoscopy (%)0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0.7Diagnostic and therapeutic bronchoscopy in outpatients644 (97.0)<				
Pulmonologist (pediatric)7 (1)General physician6 (0.9)Otorhinolaryngologist1 (0.15)Critical care physician (pediatric)1 (0.15)Duration since performing bronchoscopy (%)1Less than a year5.41-3 years19.53-5 years17.65-10 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year,100 (40-200)median (IQR)Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (multispecialty hospital)38.5Others4.5Mode of learning bronchoscopy (%)4.5Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others37.2Fiber-optic bronchoscope37.2Fiber-optic bronchoscope37.2Fiber-optic bronchoscope37.2Fiber-optic bronchoscope37.2Fiber-optic bronchoscope0.2Place of performing flexible bronchoscopy0.1Utu7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0.7Diagnostic and therapeutic bronchoscopy in outpatients (airway examination, lavage, washings, TBNA, or biopsics))535 (80.5) <td></td> <td></td>				
General physician6 (0.9) 0torhinolaryngologist1 (0.15)Ottical care physician (pediatric)1 (0.15)Duration since performing bronchoscopy (%)1 (0.15)Less than a year5.41-3 years19.53-5 years22.4>10 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year, median (IQR)100 (40-200)Place of work/designation (%)7.7Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)4.5Working under someone performing bronchoscopy45.1Training program outside India6.8Others1.6Type of flexible bronchoscope7.2Fiber-optic bronchoscope (%)7.2Video bronchoscope (%)0.2Place of performing flexible bronchoscopy2.1Parations (%)2.1Bronchoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2.1Diagnostic and therapeutic bronchoscopy in outpatients (airway examination, lavage, washings, TBNA, or biopsies)644 (97.0)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)ID agnostic and therapeutic bronchoscopy in outpatients (airway examination, lavage, washings				
Otorhinolaryngologist1 (0.15)Critical care physician (pediatric)1 (0.15)Duration since performing bronchoscopy (%)1 (0.15)Less than a year5.41-3 years19.53-5 years17.65-10 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year,100 (40-200)median (IQR)Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)Working under someone performing bronchoscopyWorking under someone performing bronchoscopy45.1Training program outside India35.2Self-learned11.3Training program outside India6.8Others1.6Not aware of the type0.2Place of performing flexible bronchoscopy43.6Not aware of the type0.2Place of performing flexible bronchoscopy79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy i outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)12 (1-5)Indications for flexible bronchoscopy i outpatients535 (80.5	General physician			
Critical care physician (pediatric)1 (0.15)Duration since performing bronchoscopy (%)1Less than a year5.41-3 years19.53-5 years17.65-10 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year,100 (40-200)median (IQR)Place of work/designation (%)100 (40-200)Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)45.1Working under someone performing bronchoscopy45.1Training program within India6.8Others1.6Type of flexible bronchoscope (%)37.2Video bronchoscope (%)43.6Not aware of the type0.2Place of performing flexible bronchoscopy7.2Endoscopy room79.8Operation theater11.7ICU7.2Endoscopy room79.8Operation theater0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)mucusTherapeutic bronchoscopy (stents, electrocautery, cours)535 (80.5)mucusTherapeutic bronchoscopy (stents, el				
Duration since performing bronchoscopy (%)Less than a year5.41-3 years19.53-5 years17.65-10 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year,100 (40-200)median (IQR)Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)45.1Working under someone performing bronchoscopy45.1Training program within India6.8Others1.6Type of flexible bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy7.2Fiber-optic bronchoscope11.7ICU7.2Endoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy in outpatients (airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)mucusTherapeutic bronchoscopy (stents, electrocautery, corytherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3) <td>Critical care physician (pediatric)</td> <td></td>	Critical care physician (pediatric)			
Less than a year5.41-3 years19.53-5 years17.65-10 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year, median (IQR)100 (40-200)Place of work/designation (%)Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope7.2Fiber-optic bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy2 (1-5)Indications for flexible bronchoscopy in outpatients (airway examination, lavage, washings, TBNA, or biopsics)0.7Number of assistants during procedure, median (IQR) Diagnostic and therapeutic bronchoscopy in outpatients (airway examination, lavage, washings, TBNA, or biopsics)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopy in ubtatients flex (24.3)416 (62.6)Confirming double lumen endotracheal tub				
3-5 years17.65-10 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year, median (IQR)100 (40-200)Place of work/designation (%)7Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)Working under someone performing bronchoscopyWorking under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy7.2Fiber-optic bronchoscope11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)100 (30.1)ICU bronchoscopy for VAP diagnosis and suctioning of535 (80.5)mucusTherapeutic bronchoscopy (sents, electrocautery, cryotherapy, etc.)535 (80.5)Bronchoscopy intubation416 (62.6)Confirming double lumen endotracheal tube placement <td></td> <td>5.4</td>		5.4		
5-10 years22.4>10 years35.1Bronchoscopy examinations performed over last 1 year, median (IQR)100 (40-200)Place of work/designation (%)7Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)Working under someone performing bronchoscopyWorking under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)7.2Video bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy7.2Endoscopy room7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of535 (80.5)mucusTherapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)535 (80.5)Bronchoscopi citubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)	1-3 years	19.5		
>10 years35.1Bronchoscopy examinations performed over last 1 year, median (IQR)100 (40-200)Place of work/designation (%)7Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)45.1Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)7.2Video bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy7.2Endoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of535 (80.5)mucusTherapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)535 (80.5)Bronchoscopi cintubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)		17.6		
Bronchoscopy examinations performed over last 1 year, median (IQR)100 (40-200)Place of work/designation (%)38.5Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)45.1Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy79.8Operation theater11.7ICU7.2Endoscopy room79.8Operation theater0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0.6Diagnostic and therapeutic bronchoscopy in outpatients (airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
median (IQR)Place of work/designation (%)Private practitioner (multispecialty hospital)Reaching faculty medical collegePost-MD or equivalent trainingPost-MD or equivalent trainingPost-MD or equivalent trainingPivate practitioner (clinic)Frivate practitioner (clinic)Private practitioner (clinic)StarPostgraduate traineeDM fellowQ.9OthersWorking under someone performing bronchoscopyWorking under someone performing bronchoscopyVideo bronchoscopeTraining program outside IndiaOthersType of flexible bronchoscope (%)Video bronchoscopeVideo bronchoscopePlace of performing flexible bronchoscopyexaminations (%)Bronchoscopy roomBronchoscopy roomOftersNumber of assistants during procedure, median (IQR)Icu bronchoscopy for VAP diagnosis and suctioning ofMuteusTherapeutic bronchoscopy (sents, electrocautery, airway examination, lavage, washings, TBNA, or biopsies)ICU bronchoscopy for VAP diagnosis and suctioning ofMucus				
Place of work/designation (%)38.5Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)Working under someone performing bronchoscopyWorking under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)1.6Video bronchoscope37.2Fiber-optic bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy2.1examinations (%)79.8Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of535 (80.5)mucusTherapeutic bronchoscopy (stents, electrocautery, cou (30.1)cryotherapy, etc.)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)		100 (40-200)		
Private practitioner (multispecialty hospital)38.5Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)Working under someone performing bronchoscopyWorking under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0.7Diagnostic and therapeutic bronchoscopy in outpatients (airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopi cintubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
Teaching faculty medical college31.1Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)Working under someone performing bronchoscopyWorking under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy72.2Endoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)Diagnostic and therapeutic bronchoscopy in outpatients (airway examination, lavage, washings, TBNA, or biopsies)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopi cintubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)		20.5		
Post-MD or equivalent training12.0Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)45.1Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope37.2Fiber-optic bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy79.8Operation theater11.7ICU7.2Endoscopy room79.8Operation theater0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
Private practitioner (clinic)5.7Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)Working under someone performing bronchoscopyWorking under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)19.0Video bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy2examinations (%)79.8Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy in outpatients (airway examination, lavage, washings, TBNA, or biopsies)644 (97.0)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
Postgraduate trainee5.3DM fellow2.9Others4.5Mode of learning bronchoscopy (%)Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)Video bronchoscope (%)Video bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy22examinations (%)79.8Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0.35 (80.5)Diagnostic and therapeutic bronchoscopy (%)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of535 (80.5)mucusTherapeutic bronchoscopy (stents, electrocautery, cou (30.1)cryotherapy, etc.)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)	Post-MD or equivalent training			
DM fellow2.9Others4.5Mode of learning bronchoscopy (%)Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)Video bronchoscopeVideo bronchoscope37.2Fiber-optic bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy20.2examinations (%)79.8Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0.35 (80.5)Diagnostic and therapeutic bronchoscopy (%)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of535 (80.5)mucusTherapeutic bronchoscopy (stents, electrocautery, cou (30.1)cryotherapy, etc.)8ronchoscopic intubationBronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
Others4.5Mode of learning bronchoscopy (%)45.1Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)72Video bronchoscope37.2Fiber-optic bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy2examinations (%)79.8Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0Diagnostic and therapeutic bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of535 (80.5)mucusTherapeutic bronchoscopy (stents, electrocautery, cu)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
Mode of learning bronchoscopy (%)45.1Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)Video bronchoscope (%)Video bronchoscope37.2Fiber-optic bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy2examinations (%)79.8Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)535 (80.5)Diagnostic and therapeutic bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy (stents, electrocautery, crudicautery, crud				
Working under someone performing bronchoscopy45.1Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)7.2Video bronchoscope37.2Fiber-optic bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopyexaminations (%)Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0.355 (80.5)Diagnostic and therapeutic bronchoscopy (%)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of tarway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)		1.0		
Training program within India35.2Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)7.2Video bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0.355 (80.5)Diagnostic and therapeutic bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)		45.1		
Self-learned11.3Training program outside India6.8Others1.6Type of flexible bronchoscope (%)7.2Video bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopyexaminations (%)Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0.7Diagnostic and therapeutic bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
Others1.6Type of flexible bronchoscope (%)37.2Video bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopyexaminations (%)Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)Diagnostic and therapeutic bronchoscopy in outpatientsDiagnostic and therapeutic bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)		11.3		
Type of flexible bronchoscope (%)37.2Video bronchoscope37.2Fiber-optic bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopyexaminations (%)Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0Diagnostic and therapeutic bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)	Training program outside India	6.8		
Video bronchoscope37.2Fiber-optic bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopyexaminations (%)Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)Diagnostic and therapeutic bronchoscopy in outpatientsOutpanotic and therapeutic bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)	Others	1.6		
Fiber-optic bronchoscope19.0Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy0.2examinations (%)79.8Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0Diagnostic and therapeutic bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
Both43.6Not aware of the type0.2Place of performing flexible bronchoscopy examinations (%)0.2Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0Diagnostic and therapeutic bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
Not aware of the type0.2Place of performing flexible bronchoscopyexaminations (%)Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0Diagnostic and therapeutic bronchoscopy (%)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
Place of performing flexible bronchoscopy examinations (%)79.8Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0Diagnostic and therapeutic bronchoscopy (%)544 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
examinations (%)79.8Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)Diagnostic and therapeutic bronchoscopy (%)Diagnostic and therapeutic bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)		0.2		
Bronchoscopy room79.8Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0Diagnostic and therapeutic bronchoscopy (%)644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
Operation theater11.7ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0Diagnostic and therapeutic bronchoscopy (%)0ICU bronchoscopy for VAP diagnosis and suctioning of535 (80.5)mucusTherapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)		70.8		
ICU7.2Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0Diagnostic and therapeutic bronchoscopy in outpatients644 (97.0)(airway examination, lavage, washings, TBNA, or biopsies)535 (80.5)ICU bronchoscopy for VAP diagnosis and suctioning of535 (80.5)mucusTherapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
Endoscopy room0.6Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)0Diagnostic and therapeutic bronchoscopy in outpatients (airway examination, lavage, washings, TBNA, or biopsies)644 (97.0)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)	-			
Others0.7Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)Diagnostic and therapeutic bronchoscopy in outpatients (airway examination, lavage, washings, TBNA, or biopsies)644 (97.0)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
Number of assistants during procedure, median (IQR)2 (1-5)Indications for flexible bronchoscopy (%)Diagnostic and therapeutic bronchoscopy in outpatients (airway examination, lavage, washings, TBNA, or biopsies)644 (97.0)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)	1 F			
Indications for flexible bronchoscopy (%)644 (97.0)Diagnostic and therapeutic bronchoscopy in outpatients (airway examination, lavage, washings, TBNA, or biopsies)644 (97.0)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
Diagnostic and therapeutic bronchoscopy in outpatients (airway examination, lavage, washings, TBNA, or biopsies)644 (97.0)ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
ICU bronchoscopy for VAP diagnosis and suctioning of mucus535 (80.5)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)		644 (97.0)		
mucus200 (30.1)Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)	(airway examination, lavage, washings, TBNA, or biopsies)			
Therapeutic bronchoscopy (stents, electrocautery, cryotherapy, etc.)200 (30.1)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)	ICU bronchoscopy for VAP diagnosis and suctioning of	535 (80.5)		
cryotherapy, etc.)Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)				
Bronchoscopic intubation416 (62.6)Confirming double lumen endotracheal tube placement162 (24.3)		200 (30.1)		
Confirming double lumen endotracheal tube placement 162 (24.3)		110 100 0		
For guidance during percutaneous tracheostomy 204 (307)				
	For guidance during percutaneous tracheostomy	. ,		
Others 17 (2.5) *Children vounger than 12 years. SD: Standard deviation.		17 (2.3)		

*Children younger than 12 years. SD: Standard deviation,

EBUS: Endobronchial ultrasound, ICU: Intensive Care Unit,

TBNA: Transbronchial needle aspiration, VAP: Ventilator-associated pneumonia, DM: Doctor of Medicine (Superspecialization)

by 54.2%, while 43.4% gave it only when desaturation occurred. Nasal cannula was the most commonly (69.6%) utilized device for administering oxygen. About 30% did not have the facility of a separate recovery room to monitor the patient following the procedure. Majority (62.6%) of the respondents observed the patient for 1–2 h or longer following bronchoscopy. Coagulation studies were routinely performed by 26.2%, while 44.5% performed them only in patients planned for either endobronchial biopsy (EBB) or transbronchial lung biopsy (TBLB). Hemoglobin and platelet counts were obtained by 52.7% and 39.5%, respectively; 35.3% obtained renal function tests as a routine in patients planned for bronchoscopy. Only 53.6% discontinued aspirin or clopidogrel before performing flexible bronchoscopic biopsy.

As part of prebronchoscopy evaluation, 61.5% obtained spirometry, while 60.7% performed arterial blood gas measurement sometimes. Majority (83.9%) would never administer prophylactic antibiotics while a fairly large number (30.9%) were routinely or occasionally administering antibiotics following bronchoscopy. Inhaled bronchodilators administered before beginning the bronchoscopy in patients with obstructive airway diseases were being used as a routine or most of the times by 73.8%.

Sedation and topical anesthesia

The details of responses are summarized in Table 4. Bronchoscopy performed only under topical anesthesia and without any conscious sedation was the most common practice (59.4%). Anticholinergic premedication was regularly or occasionally used during bronchoscopy by 55.3%. The use of a single sedative was preferred (55.6%) and midazolam alone (or in combination) was the most commonly used drug (87.0%) for sedation. Either naloxone or flumazenil was not available with 46.7% of the respondents in their bronchoscopy area. An anesthetist was available during the procedure for only 24.6% of the respondents.

Only 33.2% used nasal vasoconstrictors before nasal bronchoscopy. Lignocaine jelly (gel) was the most common method (81.2%) for nasal lignocaine administration. Nebulized lignocaine was used for topical anesthesia either routinely or occasionally by 72.4%. The most commonly (56.1%) used concentration of lignocaine for nebulization was 2%. A large number (83.6%) used 10% lignocaine spray for pharyngeal anesthesia either routinely or occasionally. Transtracheal lignocaine administration was being performed by 23.6%. The preferred method (86.1%) of delivering lignocaine to the vocal cords and the tracheobronchial tree was the spray-as-you-go technique using 2% lignocaine (75.1%). The total lignocaine dose used was documented by only 67.9%. About 68.8% had encountered one or more bronchoscopy-related complications during the previous year.

Procedural and technical aspects

The details of responses of procedural and technical aspect section are summarized in Table 5. About 80.5%

were performing Intensive Care Unit bronchoscopy and 30% of the respondents were performing therapeutic interventions including stents, electrocautery, cryotherapy, and others [Figure 1 and Table 1]. Bronchoscopic intubation for endotracheal tube placement was being performed by 62.6%. Majority (80.8%) were left-handed bronchoscopists. The nasal route was the preferred method for bronchoscope introduction by majority (94%) of the respondents. Bronchoalveolar lavage, TBNA, EBB, and TBLB were being performed by 98.8%, 74.2%, 91.6%, and 77.6%, respectively. While performing TBNA, 93.8%, 65.4%, and 7.7% were sampling the subcarinal, right paratracheal, or other stations, respectively. Only a very small number (4.5%) performed TBNA exclusively from visible endobronchial growths, while more than a half (52.8%) performed TBNA from both endobronchial growths and paratracheobronchial locations. Almost 54% would obtain bronchial brushings, while 73.6% performed bronchial washings in visible endobronchial growths, either as a routine or most of the times. Nearly 65% routinely obtained endobronchial biopsies along with TBLB in patients with sarcoidosis. Most commonly, three to four tissue pieces were obtained when performing EBB or TBLB. Only 14% were routinely using fluoroscopy while performing TBLB. Following TBLB, 85.2% routinely obtained a chest radiograph while 17.5% performed chest ultrasound to exclude pneumothorax. Almost 92.4% obtained thoracic computed tomography scan before bronchoscopy in patients with suspected lung cancer. Postbronchoscopy sputum was routinely

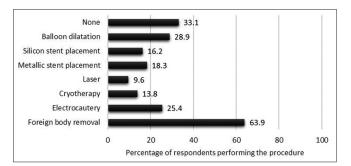


Figure 1: Details of various therapeutic bronchoscopic interventions being performed by the survey participants

Table 2: Patient preparation and monitoring details during flexible bronchoscopy

sent for mycobacterial investigations by 67.8% in a patient with suspected tuberculosis.

Bronchoscope disinfection and staff protection

The details of responses pertaining to this section are summarized in Table 6. For 78.3% of the respondents, there was a specifically designated area where bronchoscope disinfection was performed and 79% were performing manual scope disinfection exclusively. Almost 92% routinely cleaned the bronchoscope with enzymatic solution or any other detergent solution before and after bronchoscopy, while 93.2% regularly used a brush for cleaning the working channel of the bronchoscope. Complete bronchoscope immersion into the disinfectant solution was not being performed by 25.3%.

Bronchoscopes were being stored in the scope carrying case by 22.5% and 19.2% were keeping the bronchoscope valves attached during storage. Majority (92%) used 2% glutaraldehyde as the disinfectant and 85.8% were immersing the bronchoscope in the disinfectant solution for 20 min or longer. Almost 11% were unaware of the bronchoscope leak testing procedure and only 69.2% routinely performed it. 34.3% performed an alcohol rinse of the bronchoscope as the final step before storage. Patients were screened either routinely or most of the times for human immunodeficiency virus, hepatitis B, or hepatitis C status by 60.8%. The protective equipment used by the bronchoscopists during all procedures and high-risk procedures is depicted in Figures 2 and 3.

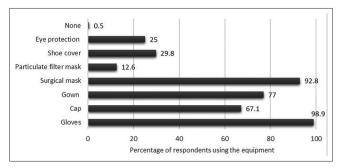


Figure 2: The protective equipment being used routinely by the survey respondents during all bronchoscopy procedures

Question	Always (%)	Most of the times (%)	Sometimes (%)	Never (%)
Obtain written informed consent before flexible bronchoscopy procedure	610 (91.7)	37 (5.5)	11 (1.7)	7 (1.1)
Perform spirometry as part of prebronchoscopy evaluation	24 (3.6)	63 (9.5)	410 (61.5)	169 (25.4)
Perform arterial blood gas analysis as part of prebronchoscopy evaluation	19 (2.8)	34 (5.1)	405 (60.7)	209 (31.3)
Record blood pressure at the time of scheduling patients for bronchoscopy	528 (79.4)	76 (11.4)	49 (7.4)	12 (1.8)
Perform ECG monitoring during flexible bronchoscopy	261 (39.1)	87 (13.0)	227 (34.0)	92 (13.8)
Secure intravenous access in patients undergoing bronchoscopy	533 (80.0)	67 (10.1)	59 (8.9)	7 (1.0)
Administer prophylactic antibiotics (before start of procedure) to patients undergoing	61 (9.3)	1 (0.15)	43 (6.6)	549 (83.9)
flexible bronchoscopy				
Administer antibiotics after completing flexible bronchoscopy	115 (17.7)	0	86 (13.2)	450 (69.1)
Administer bronchodilators (nebulized/metered dose inhalers) to patients with asthma or COPD before bronchoscopy	336 (50.7)	153 (23.1)	155 (23.4)	19 (2.9)

ECG: Electrocardiogram, COPD: Chronic obstructive pulmonary disease

Table 3: Patient preparation and monitoring detailsduring flexible bronchoscopy

Question	Responses	n (%)
Routinely fast patients before	Yes	649 (97.7)
flexible bronchoscopy Duration of fasting patients	4-8 h	480 (72.7)
before bronchoscopy	<4 h	79 (12)
before bronenoseopy	>8 h	101 (15.3)
Routinely monitor BP during	Yes	484 (73)
bronchoscopy	105	404 (75)
Routinely monitor SpO ₂	Yes	661 (99.4)
continuously during	105	001 (33.1)
bronchoscopy		
Oxygen administration during	Continuously during	360 (54.2)
flexible bronchoscopy (When?)	procedure	
	Only when desaturation	288 (43.4)
	occurs	, ,
	Do not administer	2 (0.3)
	oxygen	× /
	Others	14 (2.1)
Oxygen administration during	Nasal prongs	460 (69.6)
flexible bronchoscopy (How?)	Nasopharyngeal	121 (18.3)
15 ()	catheter/nasal cannula	, ,
	Face mask	63 (9.5)
	Others	17 (2.6)
Separate recovery room for	Yes	464 (70.1)
observation		
Duration of patient observation	<30 min	61 (9.2)
following bronchoscopy	30 min to 1 h	186 (28.2)
	1-2 h	304 (46.1)
	>2 h	109 (16.5)
Coagulation studies	Patients planned for	297 (44.5)
(PT, INR, and APTT) in	either TBLB or EBB	
patients planned for flexible	Always	175 (26.2)
bronchoscopy (When?)	Only in patients planned	92 (13.8)
	for TBLB	
	Never	44 (6.6)
	Only in patients planned	11 (1.7)
	for EBB	
	Others	48 (7.2)
BT/CT in patients planned for	Patients planned for	166 (34.2)
flexible bronchoscopy (When?)	either TBLB or EBB	120 (20 4)
	Never	138 (28.4)
	Always	102 (20.1)
	Only in patients planned	51 (10.5)
	for TBLB	7(1,4)
	Only in patients planned	7 (1.4)
	for EBB Others	22 (4 5)
Platelet count in patients	Always	22 (4.5) 264 (39.5)
planned for flexible	Patients planned for	204 (39.3) 229 (34.3)
bronchoscopy (When?)	either TBLB or EBB	229 (34.3)
bronenoscopy (when?)	Only in patients planned	65 (9.7)
	for TBLB	05 (9.7)
	Never	60 (9.0)
	Only in patients planned	11 (1.7)
	for EBB	11 (1.7)
	Others	39 (5.8)
Hemoglobin levels in	Always	350 (52.7)
patients planned for flexible	Never	133 (20.0)
bronchoscopy (When?)	Patients planned for	102 (15.4)
······································	either TBLB or EBB	(10.1)
	Only in patients planned	36 (5.4)
	for TBLB	. ()
	Only in patients planned	3 (0.5)
	for EBB	()
	Others	40 (6.0)

Contd...

Table 3: Contd...

Question	Responses	n (%)
Urea/creatinine levels in	Always	235 (35.3)
patients planned for flexible bronchoscopy (When?)	Only in patients with preexisting renal disease	211 (31.7)
	Never	105 (15.8)
	Patients planned for either TBLB or EBB	62 (9.3)
	Only in patients planned for TBLB	26 (3.9)
	Only in patients planned for EBB	4 (0.6)
	Others	22 (3.3)
If a patient planned for flexible bronchoscopic	Stop both before procedure	354 (53.6)
biopsy is receiving aspirin or	Stop Clopidogrel only	148 (22.4)
Clopidogrel, what would you	Stop aspirin only	53 (8.0)
do?	Continue both	52 (7.9)
	I don't know	17 (2.6)
	Others	36 (5.5)

 ${\rm SpO}_2{\rm :}$ Oxygen saturation, BP: Blood pressure, PT: Prothrombin time, APTT: Activated partial thromboplastin time,

INR: International normalized ratio, BT/CT: Bleeding time/clotting time, TBLB: Transbronchial lung biopsy, EBB: Endobronchial biopsy

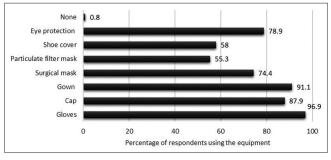


Figure 3: The protective equipment being used routinely by the survey respondents during high-risk bronchoscopy procedures

DISCUSSION

The results of the "Indian Bronchoscopy Survey" outline the bronchoscopy practices across India. The survey is large and one of the most comprehensive bronchoscopy surveys (incorporating 98 questions to assess various procedural domains) undertaken to assess the prevalent bronchoscopy practices at a national scale. The subject of bronchoscopy and interventional pulmonology has witnessed rapid developments in India over the past few years. The increasing number of publications and procedures related to bronchoscopy including therapeutic rigid bronchoscopy and EBUS-TBNA, being reported from India, has generated keen interest among pulmonologists for learning the principles and practices of bronchoscopy.^[13-15] Interestingly, a PubMed search using the search string "bronchoscopy AND India" showed that 376 of 679 (55.4%) articles had been published after 2011.

The findings of the survey reveal several interesting facts. Nearly 50% of the respondents were based in 10 of the total 155 cities from where the responses were obtained. This suggests a concentration of tertiary health-care services in

Table 4: Sedation and	topical	anesthesia	during flexible
bronchoscopy			

with our selation396 (59.4)AnticholinergicAlways95 (14.3)premedication beforeMost of the time64 (9.6)flexible bronchoscopyNever297 (44.7)Preference for single agentSingle drug370 (55.6)or combination of drugs forCombination190 (28.5)sedationPreferred agent for sedationMidazolam378 (58.3)during bronchoscopyMidazolam173 (26.7)Propofol26 (4.0)Fentanyl23 (3.6)Midazolam + pentazocine13 (2.0)Dexmedetomidine8 (1.2)Ketamine1 (0.15)Other responses26 (4)Or flumazenil in theBoth available298 (46.7)298 (46.7)bronchoscopy roomOnly flumazenil available298 (45.7)298 (46.7)Sedation administratorAnesthesiologist150 (24.6)Assisting technician74 (12.1)26 (4.0)Sedation administratorAnesthesiologist150 (24.6)Arossiting technician74 (12.1)20 (4.6)Adros (xylometazoline / uxymetazoline etc)Sometimes157 (23.7)before nasal bronchoscopyNever42 (65.8)Method of administration ofLignocaine solatowas bistick Combination jelly and solution71 (1.2)Others156 (24.4)53 (81.2)Most of the time36 (5.4)Method of administration157 (23.7)Never42 (65.8Method of administration21 (1.3)Method of administration150 (24.6)	Question	Responses	n (%)
with our selation396 (59.4)AnticholinergicAlways95 (14.3)premedication beforeMost of the time64 (9.6)flexible bronchoscopyNever297 (44.7)Preference for single agentSingle drug370 (55.6)or combination of drugs forCombination190 (28.5)sedationPreferred agent for sedationMidazolam378 (58.3)during bronchoscopyMidazolam173 (26.7)Propofol26 (4.0)Fentanyl23 (3.6)Midazolam + pentazocine13 (2.0)Dexmedetomidine8 (1.2)Ketamine1 (0.15)Other responses26 (4)Or flumazenil in theBoth available298 (46.7)298 (46.7)bronchoscopy roomOnly flumazenil available298 (45.7)298 (46.7)Sedation administratorAnesthesiologist150 (24.6)Assisting technician74 (12.1)26 (4.0)Sedation administratorAnesthesiologist150 (24.6)Arossiting technician74 (12.1)20 (4.6)Adros (xylometazoline / uxymetazoline etc)Sometimes157 (23.7)before nasal bronchoscopyNever42 (65.8)Method of administration ofLignocaine solatowas bistick Combination jelly and solution71 (1.2)Others156 (24.4)53 (81.2)Most of the time36 (5.4)Method of administration157 (23.7)Never42 (65.8Method of administration21 (1.3)Method of administration150 (24.6)	Perform most bronchoscopies	With sedation	271 (40.6)
premedication before flexible bronchoscopy Sometimes 209 (31.4 Never 297 (44.7 Ver 7) (45.7 Sometimes 209 (31.4 Never 297 (44.7 Ver 7) (45.7 Ver 7)	with or without sedation	Without sedation	396 (59.4)
Itexible bronchoscopySometimes209 (31.4Preference for single agentSingle drug370 (55.6cor combination of drugs forSingle drug370 (55.6sedationNever190 (28.5during bronchoscopyMidazolam178 (58.3during bronchoscopyMidazolam178 (58.3Midazolam173 (26.7Propofol26 (4.0)PropofolPropofol26 (4.0)20 (4.6)Availability of naloxoneNone available203 (46.7)or flumazenil in theBoth available208 (33.1)bronchoscopy roomOnly naloxone available20 (4.6)or flumazenil available209 (4.6)20 (4.6)drops (xylometazoline/Anesthesiologist150 (24.6)Assisting doctor171 (28.0)Assisting doctorvasoconstrictor nasalAlways27 (4.1)BronchoscopyNever442 (66.8Vasoconstrictor nasal bronchoscopyNever442 (66.8Use lignocaineLignocaine solution instillation15 (2.3)Method of administration of lignocaine1% (3.2)235 (81.2Nebulized lignocaine1%52 (9.2)olution for nebulization1%52 (9.2)10% lignocaine solution instillation1%52 (2.2)10% lignocaine solution for hebulization1%52 (2.2)00hers166 (24.8Never183 (27.5)00hers166 (24.8)Never183 (27.5)00hers166 (24.8)Never183 (27.5)00hers <t< td=""><td>Anticholinergic</td><td>Always</td><td>95 (14.3)</td></t<>	Anticholinergic	Always	95 (14.3)
Never297 (44.7Preference for single agent or combination of drugs for sedationSingle drug370 (55.6Sedation100 (28.5 Never use sedation106 (15.9Preferred agent for sedationMidazolam + fentanyl173 (26.7 Propofol26 (4.0) FentanylAvailability of naloxone or flumazenil in the bronchoscopy roomNone available293 (46.7 Souther responses26 (4) Ver use sedationAvailability of naloxone or flumazenil in the bronchoscopy roomNone available293 (36.7) (20.7) None available208 (33.1) (20.6)Sedation administratorAnesthesiologist150 (24.6) Assisting technician53 (8.4) (21.6)Vasoconstrictor nasal drops (xylometazoline/ oxymetazoline et)Most of the time36 (54) (23.7) Never44 (26.8) (24.1) Most of the timeNebulized lignocaine use for bronchoscopyLignocaine solution instillation Lignocaine solution instillation Prefore nasal bronchoscopy21 (33.2) (23.7) Never21 (33.2) (23.7) (24.7) Most of the time36 (54) (23.7) (24.7) Most of the time36 (54) (23.7) (23.7) Never71 (28.0) (24.6) (24.6) (25.3) (24.6) (24.6)Nebulized lignocaine use for bronchoscopyLignocaine solution instillation Lignocaine solution instillation Preferred method of pharynx21 (33.2) (24.6) (24.6)Nebulized lignocaine usolution for nebulizationYes21 (33.2) (24.6)Not of the time vocal cords and the trachea concentration of lignocaine uperferred method of preferred method of uperferre	premedication before	Most of the time	64 (9.6)
Preference for single agent or combination of drugs for solation methods of the segment of the s	flexible bronchoscopy	Sometimes	209 (31.4)
or combination of drugs for sedation Preferred agent for sedation during bronchoscopy Midazolam 378 (58.3 Midazolam 4 fentanyl 173 (26.7 Propofol 26 (4.0) Fentanyl 23 (3.6) Midazolam + pentazocine 13 (2.0) Dexmedetomidine 8 (1.2) Ketamine 1 (0.15) Other responses 26 (4) Availability of naloxone or anailable 293 (46.7) Other responses 26 (4) Availability of naloxone or flumazenil in the bronchoscopy room Only flumazenil available 293 (46.7) Sedation administrator Answissing doctor 171 (28.0) Assisting technician 74 (12.1) Bronchoscopy nurse 216 (35.3) Vasoconstrictor nasal Always 27 (4.1) drops (xylometazoline / oxymetazoline etc.,) before nasal bronchoscopy Never 442 (66.8 Use lignocaine for topical anesthesia Method of administration of nasal lignocaine is and the trane 36 (5.4) Most of the time 36 (58 (9.0) Combination jelly and solution 90 (13.7) Lignocaine solated swab stick Combination jelly and solution 90 (13.7) Lignocaine solution instillation 90 (13.7) Lignocaine solution mes 165 (24.8) Never 183 (27.5 Concentration of lignocaine Pharynx Most of the time 96 (14.4) Sometimes 168 (25.3) Never 183 (27.5 Concentration of lignocaine Preferred method of Adways 187 (28.2) Most of the time 90 (30.1) Transtracheal lignocaine Solution for "spray as you go" administration Preferred method of Grimocaine Solution for "spray as you go" administration Preferred method of Grimocaine Solution for "spray as you go" administration Preferred method of Grimocaine Encountered possible signs of lignocaine toxicity after bronchoscopy Not Solute Solution Concentration of lignocaine Encountered possible signs of lignocaine toxicity after bronchoscopy Not Solute Solution Concenter			297 (44.7)
sedation Never use sedation 106 (15.9 Preferred agent for sedation Midazolam 378 (58.3 during bronchoscopy Midazolam + fentanyl 173 (26.7 Propofol 26 (4.0) Fentanyl 23 (3.6) Midazolam + pentazocine 13 (2.0) Dexmedetomidine 8 (1.2) Ketamine 1 (0.15) Other responses 26 (4) Availability of naloxone None available 293 (46.7 or flumazenil in the Both available 293 (46.7 Sedation administrator Anesthesiologist 150 (24.6 Assisting doctor 171 (28.0 Assisting technician 74 (12.1) Bronchoscopy nurse 216 (35.3 Vasoconstrictor nasal Always 27 (4.1) Bronchoscopy nurse 157 (23.7 before nasal bronchoscopy Never 442 (66.8 Use lignocaine for topical anesthesia Method of administration of nasal lignocaine use Always 221 (33.2 Combination jelly and solution of lignocaine solated swab stick Combination jelly and solution 90 (13.7) Concentration of lignocaine solution for nebulization 2% Sometimes 165 (24.8 Never 183 (27.5) Concentration of lignocaine injection administration Preferred method of dof the time 200 (30.1 Sometimes 168 (25.3) Never 109 (16.4 Transtracheal lignocaine to the yes 156 (23.6 Never 109 (16.4 Soratimes 168 (25.3) Never 109 (16.4 Soratimes 168 (25.3) Never 109 (16.4 Soratimes 168 (25.3) Never 109 (16.4 Yes 15 (23.0 Others 6 (0.9) Most of the time 200 (30.1 Sometimes 168 (25.3) Never 109 (16.4 Soratimes 169 (21.3) Stray a you go 572 (86.1 Not aware of the signs of 18 (20.3) Not awa	Preference for single agent		370 (55.6)
Preferred agent for sedation during bronchoscopy during bronchoscopy during bronchoscopy during bronchoscopy during bronchoscopy during bronchoscopy didazolam + fentanyl Propofol Fentanyl Dexmedetomidine 8 (1.2) Ketamine (1 (0.15) Availability of naloxone or flumazenil in the bronchoscopy room or flumazenil available bronchoscopy room Only naloxone available bronchoscopy room Only naloxone available Dolly flumazenil available Stating doctor Assisting doctor Assisting technician Assisting technician Always Always Always Assoconstrictor nasal Always Assoconstrictor nasal Always Assoconstrictor Assocopy Assoconstrictor Assoconstrictor Assocopy Assoconstrictor Assoconstrictor Assocopy Assoconstrictor Assoconstrictor Assocopy Assoconstrictor Assocopy Assoconstrictor Assocopy Assoconstrictor Assocopy Assoconstrictor Assocopy Assoconstrictor Assocopy Assoconstrictor Assocopy Assoconstrictor Assocopy Assoconstrictor Assocopy Assoconstrictor Assocopy Assoconstrictor Assocopy Assoconstrictor Assocopy Assoconstrictor Assocopy Ass			190 (28.5)
during bronchoscopy Midazolam + fentanyl 173 (26.7 Propofol 26 (4.0) Fentanyl 23 (3.6) Midazolam + pentazocine 13 (2.0) Dexmedetomidine 8 (1.2) Ketamine 1 (0.15) Other responses 26 (4) Availability of naloxone None available 293 (46.7 or flumazenil in the Both available 208 (33.1 bronchoscopy room Only flumazenil available 29 (4.6) I don't know 45 (7.2) Sedation administrator Anesthesiologist 150 (24.6 Assisting doctor 171 (28.0) Avasicating doctor 171 (28.0) Avasicating doctor 171 (28.0) Assisting technician 74 (12.1) Bronchoscopy nurse 216 (35.3) Vasoconstrictor nasal Always 27 (4.1) drops (xylometazoline / Most of the time 36 (5.4) oxymetazoline etc.,) before nasal bronchoscopy Use lignocaine for topical anesthesia Method of administration of nasal lignocaine use for bronchoscopy Mise 216 (33.2) Nebulized lignocaine use for bronchoscopy Never 442 (66.8 Never 442 (66.8 Never 442 (66.8 Never 142 (66.6 Never 143 Sometimes 157 (23.7 before nasal bronchoscopy Never 442 (66.8 Never 12 (1.8) Nebulized lignocaine use for bronchoscopy Most of the time 96 (14.4) Sometimes 165 (24.8 Never 183 (27.5 Concentration of lignocaine injection administration Preferred method of daministration Preferred method of solution for rispray as you go'' administration Preferred method of Monitor and document the vocal cords and the trachea Concentration of lignocaine injection administration Preferred method of delivering lignocaine to the vocal cords and the trachea Concentration of lignocaine injection administration Preferred method of delivering lignocaine to the vocal cords and the trachea Concentration of lignocaine injection administration Preferred method of delivering lignocaine to the vocal cords and the trachea Concentration of lignocaine injection administration Preferred method of delivering lignocaine to the vocal cords and the trachea Concentration of lignocaine Encountered possible signs of lignocaine toxicly after No ta wave of the signs of lig			106 (15.9)
Propofol26 (4.0)Fentanyl23 (3.6)Midazolam + pentazocine13 (2.0)Dexmedetomidine8 (1.2)Ketamine1 (0.15)Other responses26 (4)Availability of naloxoneNone available293 (46.7)or flumazenil in theBoth available293 (46.7)bronchoscopy roomOnly flumazenil available29 (4.6)I don't know45 (7.2)Sedation administratorAnesthesiologist150 (24.6)Assisting technician74 (12.1)Bronchoscopy nurse216 (35.3)Vasoconstrictor nasal drops (xylometazoline etc)Sometimes157 (23.7)before nasal bronchoscopyNever442 (66.8)Method of administration of nasal lignocaineLignocaine isolution instillation pofict are solution instillation for bronchoscopy15 (2.3)Nebulized lignocaine use for bronchoscopyAlways221 (33.2)for bronchoscopyMost of the time96 (14.4)Onder1%52 (9.2)solution for nebulization pharynx1%52 (9.2)Never183 (27.5)24.6Concentration of lignocaine1%52 (9.2)solution for nebulization preferred method of delivering lignocaine to the togic and ministration1%15 (2.3)Preferred method of og' administrationYes156 (23.6)Preferred method of og' administration1%12 (2.0)Others1.61.6.2)13 (2.0)Outers6.10,9)10%13 (e		378 (58.3)
Fentanyl23 (3.6) Midazolam + pentazocine13 (2.0) DexmedetomidineAvailability of naloxone or flumazenil in the bronchoscopy roomNone available293 (46.7) Other responses26 (4)Availability of naloxone or flumazenil available293 (46.7) Othy naloxone available293 (46.7) Othy naloxone available293 (46.7) Othy naloxone available293 (46.7) Othy straight in the Both available293 (46.7) Othy naloxone available293 (46.7) Othy naloxone available293 (46.7) Othy straight in the Only flumazenil available29 (46.1) Castring doctor171 (28.0) Assisting doctor171 (28.0) Assisting technician74 (12.1) Bronchoscopy nurse216 (35.3) Castring doctor171 (28.0) Assisting doct	during bronchoscopy	•	173 (26.7)
Midazolam + pentazocine13 (2.0)Dexmedetomidine8 (1.2)Ketamine1 (0.15)Other responses26 (4)or flumazenil in theBoth available208 (33.1)bronchoscopy roomOnly flumazenil available29 (4.6)I don't know45 (7.2)Sedation administratorAnesthesiologist150 (24.6)Assisting doctor171 (28.0)Assisting doctor171 (28.0)Assisting technician74 (12.1)Bronchoscopy nurse216 (35.3)Vasoconstrictor nasalAlways27 (4.1)darps (xylometazoline/Most of the time36 (5.4)oxymetazoline etc.,)Sometimes157 (23.7)before nasal bronchoscopyNever442 (66.8)Use lignocaine for topical anesthesiaLignocaine solution instillation pocaine solution instillation90 (13.7)Lignocaine solution instillation potorhoscopyNever12 (1.8)Nebulized lignocaine use for bronchoscopyNever183 (24.9)Nebulized lignocaine1%52 (9.2)solution for nebulization2%317 (56.1)4%150 (26.6)I don't know46 (8.1)10% lignocaine spray to the pharynxNever183 (24.9)Most of the time200 (30.1) Sometimes168 (25.3)Never10%129 (19.7)solution for nebulization1%129 (19.7)ord of dignocaine injection administration1%129 (19.7)Preferred method of delivering lignocaine7			
Dexmedetomidine8 (1.2) KetamineAvailability of naloxoneNone available293 (46.7)or flumazenil in theBoth available208 (33.1)bronchoscopy roomOnly naloxone available29 (4.6)I don't know45 (7.2)Sedation administratorAnesthesiologist150 (24.6)Sedation administratorAnesthesiologist150 (24.6)Assisting dector171 (28.0)Assisting dector171 (28.0)Assisting dector171 (28.0)Assisting dector171 (28.0)Assisting dector171 (28.0)Assisting dector157 (23.7)before nasal bronchoscopyNever442 (66.8)Use lignocaine for topical nasal lignocaine12 (1.8)Method of administration of nasal lignocaine use for bronchoscopyLignocaine jelly535 (81.2)Concentration of lignocaine14 (30.4)15 (2.3)Concentration of lignocaine2%317 (56.1)10% lignocaine spray to the pharynxAlways187 (28.2)Most of the time200 (30.1)Sometimes168 (25.3)Never190 (16.4)Yes156 (23.6)Outror for spray as you go" administration2%Preferred method of uperferred method			
Ketamine1 (0.15) Other responses26 (4)Availability of naloxoneNone available293 (46.7)or flumazenil in theBoth available208 (33.1)bronchoscopy roomOnly naloxone available53 (8.4)Only naloxone available29 (4.6)I don't know45 (7.2)Sedation administratorAnesthesiologist150 (24.6)Assisting doctor171 (28.0)Assisting tochnician74 (12.1)Bronchoscopy nurse216 (35.3)Vasoconstrictor nasalAlways27 (4.1)drops (xylometazoline/Most of the time36 (5.4)oxymetazoline etc.,)Sometimes157 (23.7)before nasal bronchoscopyNever442 (66.8)Use lignocaine etc.,)Sometimes157 (23.7)Lignocaine solution instillationLignocaine solution instillation90 (13.7)Lignocaine solution jelly and solution7 (1.2)Others12 (1.8)Nebulized lignocaine useAlways221 (33.2)for bronchoscopyMost of the time96 (14.4)Sometimes165 (24.8)Never183 (27.5)Concentration of lignocaine2%317 (56.1)upharynxMost of the time200 (30.1)Nobultion for nebulization2%317 (56.1)pharynxMost of the time200 (30.1)Now46 (8.1)100° throw46 (8.1)10% lignocaine spray to the pharynxAlways187 (28.2)polution for "spray as you go" administration2% <td></td> <td></td> <td></td>			
Other responses26 (4)Availability of naloxoneNone available293 (46.7or flumazenil in theBoth available208 (33.1bronchoscopy roomOnly naloxone available29 (4.6)Idon't know45 (7.2)Sedation administratorAnesthesiologist150 (24.6)Sedation administratorAnesthesiologist150 (24.6)Vasoconstrictor nasalAlways27 (4.1)Bronchoscopy nurse216 (35.3)Vasoconstrictor nasalAlways27 (4.1)drops (xylometazoline/Most of the time36 (5.4)oxymetazoline etc)Sometimes157 (23.7)before nasal bronchoscopyNever442 (66.8)Use lignocaine for topical nasal lignocaineLignocaine solution instillation90 (13.7)Lignocaine solution ipelly and solution for bronchoscopy15 (2.3)Nebulized lignocaine use for bronchoscopyAlways221 (33.2)Most of the time96 (14.4)Sometimes165 (24.8)Never183 (27.5)Concentration of lignocaine1%52 (9.2)solution for nebulization2%317 (56.1)10% lignocaine spray to the pharynxAlways187 (28.2)Not of the time200 (30.1)Preferred method of of "spray as you go" administrationTranstracheal injection92 (13.9)Others6 (19.0)Most of the time200 (30.1)Outhers12 (1.9)Spray as you go572 (86.1)Ordilor and document the <br< td=""><td></td><td></td><td></td></br<>			
Availability of naloxoneNone available293 (46.7or flumazenil in theBoth available208 (33.1bronchoscopy roomOnly naloxone available29 (4.6)I don't know45 (7.2)Sedation administratorAnesthesiologist150 (24.6Assisting doctor171 (28.0Assisting doctor171 (28.0Assisting doctor74 (12.1)Bronchoscopy nurse216 (35.3Vasoconstrictor nasalAlways27 (4.1)drops (xylometazoline/Most of the time36 (5.4)vasocine for topicalanesthesi157 (23.7)before nasal bronchoscopyNever442 (66.8Use lignocaine for topicalYes658 (99.0anesthesiaLignocaine solution instillation90 (13.7)Lignocaine solution instillation90 (13.7)Lignocaine solution instillation15 (2.3)Nebulized lignocaineAlways221 (33.2for bronchoscopyMost of the time96 (14.4)Sometimes165 (24.8)Never183 (27.5)Concentration of lignocaine1%52 (9.2)solution for nebulization2%317 (56.1)10% lignocaine spray to the pharynxAlways187 (28.2)Preferred method of mijection administrationTranstracheal lignocaine1%Preferred method of mijection administrationTranstracheal lignocaine to the vocal cords and the trachea1%129 (19.7)Solution for "spray as you2%492 (75.1)go" administration </td <td></td> <td></td> <td>· · · ·</td>			· · · ·
or flumazenil in the bronchoscopy room Only naloxone available 208 (33.1 Only naloxone available 53 (8.4) Only flumazenil available 29 (4.6) I don't know 45 (7.2) Anesthesiologist 150 (24.6 Assisting doctor 171 (28.0 Assisting technician 74 (12.1)) Bronchoscopy nurse 216 (35.3 Vasoconstrictor nasal Always 27 (4.1) Bronchoscopy nurse 126 (35.3 Vasoconstrictor nasal Always 27 (4.1) Bronchoscopy Never 442 (66.8 Sometimes 157 (23.7 Ves 658 (99.0 anesthesia 120 (24.6 Sometimes 157 (23.7 Ves 658 (99.0 anesthesia 120 (24.6 Sometimes 157 (23.7 Ves 658 (99.0 anesthesia 120 (24.6 Sometimes 157 (23.7 Ves 658 (99.0 anesthesia 120 (24.6 Sometimes 157 (23.7 Ves 658 (99.0 anesthesia 120 (24.6 Sometimes 165 (24.8 Never 123 (25.2 Combination jelly and solution 7 (1.2) Others 122 (1.38 (27.5 Concentration of lignocaine use Always 221 (33.2 Gometimes 165 (24.8 Never 183 (27.5 Solution for nebulization 2% 317 (56.1 4% 150 (26.6 I don't know 46 (8.1) 10% lignocaine spray to the injection administration Preferred method of Sometimes 168 (25.3 Never 109 (16.4 Yes 156 (23.6 Never 109 (16.4 Yes			
bronchoscopy room bronchoscopy room Only naloxone available Only flumazenil available I don't know Anesthesiologist Anesthesiologist Anesthesiologist Anesthesiologist Anesthesiologist Anesthesiologist Assisting doctor Assisting technician 74 (12.1) Bronchoscopy nurse 216 (35.3 Always 27 (4.1) Bronchoscopy nurse 216 (35.3 27 (4.1) Bronchoscopy Never 442 (66.8 90.0 Assisting doctor 157 (23.7 Never 442 (66.8 90.0 157 (23.7) Never 442 (66.8 157 (23.7) Never 442 (66.8 150 (23.6 100 caine soaked swab stick 15 (2.3) Combination jelly and solution 7 (1.2) Others 12 (1.8) Nebulized lignocaine use for bronchoscopy Most of the time 96 (14.4) Sometimes 165 (24.8 Never 183 (27.5 Concentration of lignocaine 1% 10% lignocaine spray to the pharynx Most of the time 200 (30.1 Sometimes 168 (25.3 Never 109 (16.4 4% 10% 10% 10% 10% 10% 10% 10% 10			
NormalOnly flumazenil available 29 (4.6)I don't know45 (7.2)Sedation administratorAnesthesiologistSedation administratorAnesthesiologistAnesthesiologist150 (24.6)Assisting doctor171 (28.0)Assisting doctor74 (12.1)Bronchoscopy nurse216 (35.3)Vasoconstrictor nasalAlways27 (4.1)otrys (xylometazoline/Most of the time36 (5.4)yoymetazoline etc)Sometimes157 (23.7)before nasal bronchoscopyNever442 (66.8)Use lignocaine for topical anesthesiaLignocaine jelly535 (81.2)Method of administration of nasal lignocaineLignocaine solution instillation Uignocaine soaked swab stick15 (2.3)Concentration of lignocaineAlways221 (33.2)for bronchoscopyMost of the time96 (14.4)Sometimes165 (24.8)Neversolution for nebulization2%317 (56.1)4%150 (26.6)I don't know46 (8.1)10% lignocaine spray to the pharynxAlways187 (28.2)Most of the time200 (30.1)Sometimes168 (25.3)Never109 (16.4)Yes156 (23.6)10%Usingocaine to the transtracheal lignocaine1%129 (13.9)Spray as you go572 (86.1)10%13 (2.0)0015 (2.3)Uthers6 (0.9)Most of the time200 (30.1)15 (2.3)01Transtracheal injection92 (13.9)			
Sedation administratorI don't know 45 (7.2)Sedation administratorAnesthesiologist150 (24.6)Assisting doctor171 (28.0)Assisting technician74 (12.1)Bronchoscopy nurse216 (35.3)Vasoconstrictor nasalAlways27 (4.1)drops (xylometazoline etc.,)Sometimes157 (23.7)before nasal bronchoscopyNever442 (66.8)Use lignocaine for topical anesthesiaYes658 (99.0)Method of administration of nasal lignocaineLignocaine jelly535 (81.2)Nebulized lignocaine use for bronchoscopyAlways221 (33.2)Korto for nebulization12 (1.8)7 (1.2)Others165 (24.8)Never183 (27.5)Concentration of lignocaine solution for nebulization1%52 (9.2)2%317 (56.1)4%150 (26.6)I don't know46 (8.1)10% (16.4)10% lignocaine spray to the pharynxAlways187 (28.2)Most of the time200 (30.1)168 (25.3)Never109 (16.4)136 (2.0)10% cords and the tracheal concentration of lignocaine1%129 (19.7)solution for "spray as you go" administration2%492 (75.1)Monitor and document the total dose of lignocaine fol lignocaine toxicity after bronchoscopyYes109 (16.4)Monitor and document the total dose of lignocaine fol lignocaine toxicity after bronchoscopyYes109 (16.4)Monitor and document the total dose of lignocaine <b< td=""><td>bronchoscopy room</td><td>5</td><td>. ,</td></b<>	bronchoscopy room	5	. ,
Sedation administratorAnesthesiologist150 (24.6Assisting doctor171 (28.0Assisting technician74 (12.1)Bronchoscopy nurse216 (35.3)Vasoconstrictor nasalAlways27 (4.1)drops (xylometazoline etc.,)Sometimes157 (23.7)before nasal bronchoscopyNever442 (66.8)Use lignocaine for topicalYes658 (99.0)anesthesiaLignocaine jelly535 (81.2)Method of administration ofLignocaine soaked swab stick15 (2.3)nasal lignocaineLignocaine soaked swab stick15 (2.3)Others12 (1.8)Nebulized lignocaine useAlways221 (33.2)for bronchoscopyMost of the time96 (14.4)Sometimes165 (24.8)Never183 (27.5)Concentration of lignocaine1%52 (9.2)solution for nebulization2%317 (56.1)4%150 (26.6)1 don't know46 (8.1)10% lignocaine spray to the pharynxAlways187 (28.2)Never109 (16.4)Sometimes168 (25.3)Never109 (16.4)13 (2.0)10%129 (19.7)2%solution for "spray as you go" administration1%129 (19.7)Preferred method of of "spray as you go" administration1%129 (19.7)Monitor and document the total dose of lignocaine follogocaineYes449 (67.9)Monitor and document the total dose of lignocaine follogocaine toxicity after honchoscopy <t< td=""><td></td><td></td><td><pre></pre></td></t<>			<pre></pre>
Assisting doctor171 (28.0 Assisting technicianAssisting technician74 (12.1) Bronchoscopy nurse216 (35.3)Vasoconstrictor nasalAlways27 (4.1)drops (xylometazoline/ most peter nasal bronchoscopyMost of the time36 (5.4)oxymetazoline etc.,)Sometimes157 (23.7)before nasal bronchoscopyNever442 (66.8)Use lignocaine for topical anesthesiaLignocaine jelly535 (81.2)Method of administration of nasal lignocaineLignocaine solution instillation Lignocaine solution instillation Others90 (13.7)Nebulized lignocaine use for bronchoscopyAlways221 (3.2)Nebulized lignocaine use for bronchoscopyAlways213 (32.2)Nebulized lignocaine solution for nebulization1%52 (9.2)Solution for nebulization pharynx2%317 (56.1)10% lignocaine spray to the pharynxAlways187 (28.2)Preferred method of delivering lignocaine solution for "spray as you go" administrationTranstracheal injection92 (13.9)Preferred method of delivering lignocaine solution for "spray as you go" administration1%129 (19.7)Monitor and document the total dose of lignocaine for lignocaine for lignocaine solution for "spray as you go" administrationYes109 (16.4)Monitor and document the total dose of lignocaine for lignocaine for lignocaine for spray as you go" administrationYes109 (16.4)Most of the signs of lignocaine toxicity after bronchoscopyYes <td>~</td> <td></td> <td></td>	~		
Assisting technician74 (12.1) Bronchoscopy nurseVasoconstrictor nasalAlways27 (4.1)drops (xylometazoline etc.,)Most of the time36 (5.4)oxymetazoline etc.,)Sometimes157 (23.7)before nasal bronchoscopyNever442 (66.8)Use lignocaine for topical anesthesiaYes658 (99.0)Method of administration of nasal lignocaineLignocaine solution instillation Uignocaine soaked swab stick Combination jelly and solution tignocaine solution for the time90 (13.7)Nebulized lignocaine use for bronchoscopyAlways221 (33.2) Most of the time96 (14.4) SometimesSonetimes165 (24.48) NeverNever183 (27.5)Concentration of lignocaine solution for nebulization2%317 (56.1) 4%10% lignocaine spray to the injection administration Preferred method of delivering lignocaine to the vocal cords and the tracheaYes156 (23.6) NeverNonitor and document the total dose of lignocaine total dose of lignocaine for dilgnocaine solution for "spray as you go" administration2%492 (75.1) 3 (2.0) Not aware of the signs of solution for Stare as you yofYes109 (16.4) 3 (2.0)Monitor and document the total dose of lignocaine total dose of lignocaine tot	Sedation administrator		
Vasoconstrictor nasal drops (xylometazoline/ oxymetazoline etc.,)Bronchoscopy Always216 (35.3 27 (4.1) Most of the time36 (5.4) 36 (5.4)voymetazoline etc.,) before nasal bronchoscopyNever442 (66.8 (5.8)36 (5.4)Use lignocaine for topical anesthesiaVes658 (99.0Method of administration of nasal lignocaineLignocaine jelly535 (81.2 Lignocaine soaked swab stick535 (81.2 (2.3) (2.3)Nebulized lignocaineLignocaine soaked swab stick Combination jelly and solution7 (1.2) (2.3) (2.3)Nebulized lignocaine use for bronchoscopyAlways221 (33.2 (33.2) (2.4) (2.4)Nebulized lignocaineAlways221 (33.2) (2.4) (2.4)Nebulized lignocaine1%52 (9.2) (2.4) (3.4)Solution for nebulization2%317 (56.1) 4%10% lignocaine spray to the pharynxAlways187 (28.2) NeverNost of the time pharynx200 (30.1) (3.6)100't throwYes168 (25.3) Never109 (16.4) (12.2)Transtracheal lignocaine tocal cords and the trachea1%129 (19.7) (2.3) (2%Solution for "spray as you go" administration2%492 (75.1) (2.3) (2.4)Monitor and document the total dose of lignocaine encountered possible signs of lignocaine total dose of lignocaine encountered possible signs of lignocaine toxicity after bronchoscopyYes109 (16.4) (15.2.3) (2.3) (2.4)Monitor and document the total dose of lignocaine encountered possible signs 			
Vasoconstrictor nasal drops (xylometazoline / oxymetazoline etc.,)Always27 (4.1)Most of the time36 (5.4)Sometimes157 (23.7)before nasal bronchoscopyNeverUse lignocaine for topical anesthesiaYesMethod of administration of nasal lignocaineLignocaine jellyMethod of administration of nasal lignocaineLignocaine soaked swab stick Combination jelly and solution Others7 (1.2)Nebulized lignocaineAlways221 (33.2)for bronchoscopyMost of the time96 (14.4)Sometimes165 (24.8) NeverNeverSolution for nebulization2%317 (56.1)4%150 (226.6)I don't know10% lignocaine spray to the pharynxAlways187 (28.2) NeverNever109 (16.4)Transtracheal lignocaine injection administrationYes156 (23.6) NeverPreferred method of solution for "spray as you go" administrationTranstracheal injection92 (13.9) Spray as you goGorie and document the total dose of lignocaine total dose of lignocaine bronchoscopyYes109 (16.4) Store 4%Monitor and document the total dose of lignocaine bronchoscopyYes109 (19.7) Store 4%Monitor and document the bronchoscopyYes109 (16.4) Store 4%Monitor and document the bronchoscopyYes109 (16.4) Store 4%Jago" administrationYes109 (10.6) Store 4%Most of the time solution for "spray as you go" administration <t< td=""><td></td><td></td><td></td></t<>			
drops (xylometazoline/ oxymetazoline etc.,)Most of the time36 (5.4)oxymetazoline etc.,)Sometimes157 (23.7)before nasal bronchoscopyNever442 (66.8)Use lignocaine for topical anesthesiaYes658 (99.0)Method of administration of nasal lignocaineLignocaine jelly535 (81.2)Method of administration of topocaineLignocaine solution instillation Lignocaine solution instillation Others90 (13.7)Nebulized lignocaine use for bronchoscopyAlways221 (33.2)Most of the time96 (14.4) Sometimes165 (24.8)Never183 (27.5)183 (27.5)Concentration of lignocaine solution for nebulization2%317 (56.1)10% lignocaine spray to the pharynxAlways187 (28.2) NeverNever10% of the time200 (30.1) Sometimes168 (25.3) NeverTranstracheal lignocaine injection administrationYes156 (23.6) Transtracheal lignocaine toycal cords and the tracheaConcentration of lignocaine solution for "spray as you go" administration2%492 (75.1) 3 (2.0)Monitor and document the total dose of lignocaine Encountered possible signs of lignocaine toxicity after bronchoscopyYes109 (16.4) 4 (67.9)Monitor and document the toral dose of lignocaine Lignocaine toxicity after bronchoscopyYes109 (16.4) 4 (67.9)Monitor and document the toral dose of lignocaine Lignocaine Lignocaine toxicity after bronchoscopyYes109 (16.4) 4 (67.9)Lignocai	X 7 / 1	15	· · · · ·
oxymetazoline etc.,) before nasal bronchoscopySometimes157 (23.7)before nasal bronchoscopy Use lignocaine for topical anesthesiaNever442 (66.8)Method of administration of nasal lignocaineLignocaine jelly535 (81.2)Method of administration of nasal lignocaineLignocaine solution instillation Lignocaine soaked swab stick Combination jelly and solution Others90 (13.7)Nebulized lignocaine use for bronchoscopyAlways221 (33.2)Nebulized lignocaine use for bronchoscopyAlways221 (33.2)Concentration of lignocaine solution for nebulization1%52 (9.2)10% lignocaine spray to the pharynx1%22%317 (56.1)4% broch the time2%317 (56.1)4%10% lignocaine spray to the pharynxAlways187 (28.2)Never100't know46 (8.1)10% lignocaine spray to the pharynxYes156 (23.6)Never109 (16.4)129 (19.7)Sonetimes166 (24.8)Never199 (16.4)Yes190 (16.4)Sonatinistration2%Yes449 (67.9)Others6 (0.9)Yes10%10%15 (2.3)Others6 (0.9)Yes190 (16.4)Nonitor and document the total dose of lignocaineYesEncountered possible signs of lignocaine toxicity afterYesYes109 (16.4)Not aware of the signs of lignocaine toxicity547 (82.4)Not aware of			
before nasal bronchoscopy Use lignocaine for topical anesthesia Method of administration of nasal lignocaine Lignocaine solution instillation nothers Methol of administration of nasal lignocaine Lignocaine solution instillation Definition jelly and solution Others Methol of administration of the signs of the time procentration of lignocaine polution for nebulization Difference Methol of administration of the signs of the time pharynx Methol of administration Methol of administration Methol of administration Methol of administration Methol of administration Methol of administration Methol of administration Difference Methol of administration Difference Methol of administration Difference Methol of Second Most of the time pharynx Methol of the time pharynx Methol of the time Second Difference Methol of Second Difference Methol of Second Difference Methol of Second Difference Methol of Second Difference Methol of Second Difference Methol of Second Difference Difference Methol of Second Difference Difference Methol of Second Difference Difference Methol of Second Difference Di			
Use lignocaine for topical anesthesiaYes658 (99.0Method of administration of nasal lignocaineLignocaine jelly535 (81.2Method of administration of nasal lignocaineLignocaine soaked swab stick Combination jelly and solution Others15 (2.3)Nebulized lignocaine use for bronchoscopyAlways221 (33.2Nebulized lignocaine use for bronchoscopyAlways221 (33.2Nebulized lignocaine%165 (24.8 NeverNever183 (27.5Concentration of lignocaine1%52 (9.2)solution for nebulization2%317 (56.1 4%10% lignocaine spray to the pharynxAlways187 (28.2 NeverMost of the time pharynx200 (30.1 Sometimes168 (25.3 NeverTranstracheal lignocaine injection administrationYes156 (23.6 (23.6Preferred method of solution for "spray as you go" administrationTranstracheal injection 92 (13.9)92 (13.9) Spray as you goMonitor and document the Encountered possible signs of lignocaine total dose of lignocaine bronchoscopyYes109 (16.4 Not aware of the signs of solutionMonitor and document the bronchoscopyYes109 (16.4 Not aware of the signs of sol (1.2) lignocaine toxicity109 (16.4 Solution			
anesthesiaLignocaine jelly535 (81.2Method of administration of nasal lignocaineLignocaine solution instillation Lignocaine soaked swab stick Combination jelly and solution Others90 (13.7)Nebulized lignocaine use for bronchoscopyAlways221 (33.2)Nebulized normalizationAlways221 (33.2)Sometimes165 (24.8)Never183 (27.5)Concentration of lignocaine1%52 (9.2)solution for nebulization2%317 (56.1)4%150 (26.6)I don't know46 (8.1)10% lignocaine spray to the pharynxAlways187 (28.2)Most of the time200 (30.1)Sometimes168 (25.3)Never109 (16.4)Transtracheal lignocaine1%129 (19.7)solution for "spray as you go" administration1%129 (19.7)Prefered method of on for "spray as you go" administration1%129 (19.7)Monitor and document the Encountered possible signs of lignocaine toxicity after bronchoscopyYes109 (16.4)Monitor and document the Encountered possible signs of lignocaine toxicity after bronchoscopyYes109 (16.4)Not aware of the signs of lignocaine toxicity10.2)10.4			
Method of administration of nasal lignocaineLignocaine jelly535 (81.2 (90 (13.7)) Lignocaine soaked swab stick Combination jelly and solution Others535 (81.2 (90 (13.7)) (1.2) (1.2) (2.3) (2.3)Nebulized lignocaine use for bronchoscopyAlways221 (33.2 (33.2) (34.2) SometimesNebulized lignocaine use for bronchoscopyAlways221 (33.2) (34.2) (34.2)Nebulized lignocaine use for bronchoscopyAlways221 (33.2) (34.2)Neture183 (27.5) (24.4) Sometimes165 (24.8) (24.4) SometimesConcentration of lignocaine solution for nebulization2%317 (56.1) (4%10% lignocaine spray to the pharynxAlways187 (28.2) (26.6) I don't know188 (25.3) (26.6) I don't knowTranstracheal lignocaine injection administrationYes156 (23.6) (23.6) (16.4) (24.8) Never109 (16.4) (16.4) (23.6) (10.4) (24.8) NeverTranstracheal lignocaine to the vocal cords and the trachead Concentration of lignocaine go" administration1%129 (19.7) (20.3) (16.4) (20.3) (16.4) (20.3) (10%Monitor and document the Encountered possible signs of lignocaine total dose of lignocaine for lignocaine for lignocaine total dose of lignocaine for lignocaine for lignocaine total dose of lignocaine for lign		Yes	658 (99.0)
nasal lignocaineLignocaine solution instillation90 (13.7)Lignocaine soaked swab stick15 (2.3)Combination jelly and solution7 (1.2)Others12 (1.8)Nebulized lignocaine useAlways221 (33.2for bronchoscopyMost of the time96 (14.4)Sometimes165 (24.8)Never183 (27.5)Concentration of lignocaine1%solution for nebulization2%10% lignocaine spray to theAlwayspharynxAlwaysMost of the time200 (30.1)Sometimes168 (25.3)Never109 (16.4)Transtracheal lignocaineYesinjection administration1%Preferred method ofTranstracheal injectiondelivering lignocaine to theSpray as you gosolution for "spray as you2%go" administration1%Monitor and document theYesEncountered possible signsYesothers6 (0.9)Monitor and document theYesIngocaine toxicityYesMonitor and document theYesNot aware of the signs of lignocaine toxicityNot aware of the signs of lignocaine toxicity		Lignossina jelly	525 (81.2)
Lignocaine soaked swab stick Combination jelly and solution Others15 (2.3) 7 (1.2) 12 (1.8)Nebulized lignocaine use for bronchoscopyAlways221 (33.2) Most of the time Sometimes96 (14.4) 96 (14.4) SometimesConcentration of lignocaine solution for nebulization1%52 (9.2) 2%2%1150 (26.6) 10% lignocaine spray to the pharynx160 't know10% lignocaine spray to the pharynxAlways187 (28.2) NeverTranstracheal lignocaine injection administrationYes166 (23.6) 10%Preferred method of concentration of lignocaine toycal cords and the tracheaTranstracheal injection92 (13.9) 92 (13.9)Solution for "spray as you go" administration2%492 (75.1) 4%Monitor and document the total dose of lignocaine for lignocaine toxicity10%15 (2.3) (2.3) (2.4)Monitor and document the bronchoscopyYes109 (16.4) (67.9)Konitor and document the bronchoscopyYes109 (16.4) (67.9)Kost of the signs of lignocaine toxicityYes109 (16.4) (67.9)			
Combination jelly and solution7 (1.2)Others12 (1.8)Nebulized lignocaine useAlways221 (3.2)for bronchoscopyMost of the time96 (14.4)Sometimes165 (24.8)Never183 (27.5)Concentration of lignocaine1%52 (9.2)solution for nebulization2%317 (56.1)10% lignocaine spray to theAlways187 (28.2)pharynxMost of the time200 (30.1)Sometimes168 (25.3)Never109 (16.4)Transtracheal lignocaineYesinjection administrationYesPreferred method ofTranstracheal injectiondelivering lignocaine to theSpray as you gosolution for "spray as you2%go" administration1%10%129 (19.7)solution for "spray as you2%Monitor and document theYesEncountered possible signsYesof lignocaineYesIngocaine toxicityYesMonitor and document theYesEncountered possible signsYesIngocaine toxicity109 (16.4)Not aware of the signs of lignocaine toxicity	nasai ngnocame		
Nebulized lignocaine use for bronchoscopyOthers $12 (1.8)$ $AlwaysNebulized lignocaine usefor bronchoscopyAlways221 (33.2)Most of the timeMost of the timeSometimes96 (14.4)SometimesSometimes165 (24.8)NeverNever183 (27.5)2(9.2)Solution for nebulization1\%2\%317 (56.1)4\%10\% lignocaine spray to thepharynxI don't know10\% lignocaine spray to theinjection administrationAlways187 (28.2)Most of the timeSometimes168 (25.3)Never109 (16.4)Spray as yougo" administrationYes156 (23.6)10\%129 (19.7)13 (2.0)10\%Monitor and document theEncountered possible signsof lignocaine toxicity afterbronchoscopyYesNot aware of the signs oflignocaine toxicity109 (16.4)15 (2.3)$			
Nebulized lignocaine use for bronchoscopyAlways $221 (33.2)$ for bronchoscopyMost of the time $96 (14.4)$ Sometimes $165 (24.8)$ NeverConcentration of lignocaine 1% $52 (9.2)$ 2% solution for nebulization 2% $317 (56.1)$ 4% 10% lignocaine spray to the pharynxAlways $187 (28.2)$ Most of the time 10% lignocaine spray to the pharynxAlways $187 (28.2)$ Most of the time $200 (30.1)$ SometimesSometimes $168 (25.3)$ Never $109 (16.4)$ Transtracheal lignocaineYes $156 (23.6)$ Never 10% cold cords and the trachead 1% Spray as you go $572 (86.1)$ 2% 2% $492 (75.1)$ $2.3)$ Others $199 (16.4)$ $13 (2.0)$ 10% 10% $129 (19.7)$ $2.3)$ Others $109 (16.4)$ $15 (2.3)$ 0 $15 (2.3)$ 0 $15 (2.3)$ Monitor and document the total dose of lignocaineYes $449 (67.9)$ $15 (2.3)$ 0 $16.4 (59.2)$ $109 (16.4)Monitor and document thetotal dose of lignocaineYes109 (16.4)15 (2.3)0109 (16.4)for lignocaine toxicityYes109 (16.4)15 (2.3)for lignocaine toxicity afterbronchoscopyNot aware of the signs of8 (1.2)lignocaine toxicity$			
for bronchoscopyMost of the time $96 (14.4)$ Sometimes $165 (24.8)$ Never $183 (27.5)$ Concentration of lignocaine 1% solution for nebulization 2% $317 (56.1)$ 4% $150 (26.6)$ I don't know $46 (8.1)$ 10% lignocaine spray to theAlwayspharynxMost of the time $200 (30.1)$ Sometimes $168 (25.3)$ Never $109 (16.4)$ Transtracheal lignocaineYesinjection administration Yes Preferred method ofTranstracheal injectionvocal cords and the tracheatSpray as you gosolution for "spray as you 2% go" administration 4% Monitor and document the total dose of lignocaineYesEncountered possible signsYesMonitor and document the total dose of lignocaineYesIngocaine toxicityYesMonitor and document the total dose of lignocaineYesIngocaine toxicityYesIngocaine toxicityNot aware of the signs of lignocaine toxicity	Nebulized lignocaine use		
LinkSometimes165 (24.8Concentration of lignocaine1%52 (9.2)solution for nebulization2%317 (56.14%150 (26.6)I don't know46 (8.1)10% lignocaine spray to theAlways187 (28.2pharynxMost of the time200 (30.1)Sometimes168 (25.3)Never109 (16.4)Transtracheal lignocaineYesPreferred method ofTranstracheal injectionPreferred method ofSpray as you goSolution for "spray as you2%go" administration4%10%129 (19.7)solution for "spray as you2%go" administration4%13 (2.0)10%10%15 (2.3)Others6 (0.9)Monitor and document the Encountered possible signsYesIngocaine toxicityYesNot aware of the signs of lignocaine toxicity			
Never183 (27.5Concentration of lignocaine 1% 52 (9.2)solution for nebulization 2% 317 (56.1 4% 150 (26.6I don't know 46 (8.1) 10% lignocaine spray to theAlways 187 (28.2pharynxMost of the time 200 (30.1Sometimes 168 (25.3Never 109 (16.4Transtracheal lignocaineYes 156 (23.6injection administrationTranstracheal injection 92 (13.9)Preferred method ofTranstracheal injection 92 (13.9)delivering lignocaine to the vocal cords and the tracheadSpray as you go 572 (86.1go" administration 1% 129 (19.7solution for "spray as you go" administration 4% 13 (2.0) 10% 15 (2.3)Others 6 (0.9)Monitor and document the total dose of lignocaineYes 449 (67.9for lignocaine toxicity after bronchoscopyNot aware of the signs of lignocaine toxicity 8 (1.2)	for bronenoscopy		
Concentration of lignocaine 1% $52 (9.2)$ solution for nebulization 2% $317 (56.1)$ 4% $150 (26.6)$ I don't know $46 (8.1)$ 10% lignocaine spray to theAlways $187 (28.2)$ pharynxMost of the time $200 (30.1)$ Sometimes $168 (25.3)$ Never $109 (16.4)$ Transtracheal lignocaineYesinjection administrationTranstracheal injectionPreferred method ofTranstracheal injectionSoucior of spray as you 2% go" administration 2% Monitor and document the total dose of lignocaineYesEncountered possible signsYesof lignocaine toxicityYesNo $547 (82.4)$ No $547 (82.4)$ No $547 (82.4)$ No $547 (82.4)$ No $8 (1.2)$ lignocaine toxicityNot aware of the signs of lignocaine toxicity			
solution for nebulization2%317 (56.1)10% lignocaine spray to the pharynxI don't know46 (8.1)10% lignocaine spray to the pharynxAlways187 (28.2)Most of the time200 (30.1)Sometimes168 (25.3) NeverTranstracheal lignocaine injection administrationYesPrefered method of collector and the tracheal concentration of lignocaine go" administrationTranstracheal injection92 (13.9) delivering lignocaine to the solution for "spray as you go" administrationSpray as you go572 (86.1) vocal cords and the trachead concentration of lignocaine go" administration1%10% total dose of lignocaine Encountered possible signs of lignocaine toxicity after bronchoscopyYes109 (16.4) of lignocaine toxicityYes109 (16.4) solution to the total dose of lignocaine for spray after bronchoscopyYes109 (16.4) of lignocaine toxicityYes109 (16.4) solution toxicityStar (82.4) Not aware of the signs of lignocaine toxicity	Concentration of lignocaine		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			
I don't know46 (8.1)10% lignocaine spray to the pharynxAlways187 (28.2)Most of the time200 (30.1)Sometimes168 (25.3)Never109 (16.4)Transtracheal lignocaineYes156 (23.6)156 (23.6)injection administrationTranstracheal injectionPreferred method of delivering lignocaine to the vocal cords and the tracheaTranstracheal injection200 (30.1)Spray as you go200 (30.1)Spray as you go201 (19.7)Solution for "spray as you go" administration10%129 (19.7)solution for "spray as you go" administration2%4% total dose of lignocaine10%Encountered possible signs of lignocaine toxicity after bronchoscopyYesNot aware of the signs of lignocaine toxicity8 (1.2)	solution for neounzation		· · · · ·
10% lignocaine spray to the pharynxAlways187 (28.2 200 (30.1 Sometimes Never108 of the time sometimes200 (30.1 Sometimes 168 (25.3 NeverTranstracheal lignocaine injection administrationYes166 (23.6 (23.6)Prefered method of collector administrationTranstracheal injection92 (13.9) 92 (13.9)Prefered method of delivering lignocaine to the vocal cords and the tracheaTranstracheal injection92 (13.9) 92 (13.9)Concentration of lignocaine go" administration1%129 (19.7) 13 (2.0) 10%15 (2.3) 0 (16.4)Monitor and document the total dose of lignocaine of lignocaine toxicity after bronchoscopyYes109 (16.4) (16.4)NoS47 (82.4) Not aware of the signs of lignocaine toxicity12.2) (12.2)			
pharynxMost of the time200 (30.1Sometimes168 (25.3)Never109 (16.4)Transtracheal lignocaineYesInjection administrationTranstracheal injectionPreferred method ofTranstracheal injectiondelivering lignocaine to theSpray as you govocal cords and the trachea572 (86.1)Concentration of lignocaine1%go" administration2%Monitor and document theYesEncountered possible signsYesof lignocaine toxicity afterNoSolution for concentration10%10%15 (2.3)Others6 (0.9)Monitor and document theYesEncountered possible signsYesYes109 (16.4)of lignocaine toxicity afterNoNot aware of the signs of lignocaine toxicity	10% lignocaine spray to the		
Sometimes168 (25.3)Never109 (16.4)Transtracheal lignocaineYesinjection administrationTranstracheal injectionPreferred method ofTranstracheal injectiondelivering lignocaine to theSpray as you govocal cords and the tracheaSpray as you goConcentration of lignocaine1%go" administration1%Monitor and document theYesEncountered possible signsYesof lignocaine toxicity afterNosolution for concent toxicityYesMonitor and document theYesIsonchoscopyNot aware of the signs of lignocaine toxicity			
Never109 (16.4)Transtracheal lignocaineYes156 (23.6)injection administrationTranstracheal injection92 (13.9)Preferred method ofTranstracheal injection92 (13.9)delivering lignocaine to the vocal cords and the tracheaSpray as you go572 (86.1)Concentration of lignocaine1%129 (19.7)solution for "spray as you go" administration2%492 (75.1)Monitor and document the Encountered possible signsYes449 (67.9)total dose of lignocaineYes109 (16.4)of lignocaine toxicity after bronchoscopyNot aware of the signs of lignocaine toxicity8 (1.2)	pharynx		
Transtracheal lignocaine injection administrationYes156 (23.6Preferred method of delivering lignocaine to the vocal cords and the tracheaTranstracheal injection92 (13.9)delivering lignocaine to the vocal cords and the tracheaSpray as you go572 (86.1)Concentration of lignocaine solution for "spray as you go" administration1%129 (19.7)300 Monitor and document the Encountered possible signs of lignocaine total dose of lignocaine1%13 (2.0)Monitor and document the total dose of lignocaine total dose o			
injection administration Preferred method of delivering lignocaine to the vocal cords and the trachea Concentration of lignocaine go" administration Monitor and document the Encountered possible signs of lignocaine Encountered possible signs of lignocaine toxicity Monitor and counce Encountered possible signs Pressing a you go Transtracheal injection Spray as you go Spray as you	Transtracheal lignocaine		
Preferred method of delivering lignocaine to the vocal cords and the tracheaTranstracheal injection Spray as you go92 (13.9) 572 (86.1)Concentration of lignocaine solution for "spray as you go" administration1%129 (19.7) 492 (75.1)go" administration2%492 (75.1) 13 (2.0) 10%13 (2.0) 15 (2.3) OthersMonitor and document the Encountered possible signs of lignocaine toxicity after bronchoscopyYes109 (16.4) S47 (82.4)		103	150 (25.0)
delivering lignocaine to the vocal cords and the tracheaSpray as you go572 (86.1Concentration of lignocaine solution for "spray as you go" administration1%129 (19.730 administration2%492 (75.14%13 (2.0)10%15 (2.3)00%15 (2.3)0thers6 (0.9)Monitor and document the total dose of lignocaineYes449 (67.9Encountered possible signs of lignocaine toxicity after bronchoscopyYes109 (16.4)Not aware of the signs of lignocaine toxicity8 (1.2)		Transtracheal injection	92 (13.9)
vocal cords and the tracheaConcentration of lignocaine1%solution for "spray as you2%go" administration4%13 (2.0)10%15 (2.3)Others6 (0.9)Monitor and document the Encountered possible signsYes19 (16.4)of lignocaine toxicity after bronchoscopyNot aware of the signs of lignocaine toxicity			
Concentration of lignocaine1%129 (19.7)solution for "spray as you2%492 (75.1)go" administration4%13 (2.0)10%15 (2.3)Others6 (0.9)Monitor and document the total dose of lignocaineYesEncountered possible signs of lignocaine toxicity afterYesNo547 (82.4)Not aware of the signs of lignocaine toxicity8 (1.2)		Spruy us you go	572 (00.1)
solution for "spray as you go" administration2%492 (75.1 13 (2.0) 10%go" administration4%13 (2.0) 10%10%15 (2.3) Others6 (0.9)Monitor and document the total dose of lignocaineYes449 (67.9 109 (16.4)Encountered possible signs of lignocaine toxicity after bronchoscopyYes109 (16.4) 547 (82.4)Not aware of the signs of lignocaine toxicity8 (1.2)		1%	129 (197)
go" administration4%13 (2.0)10%15 (2.3)Others6 (0.9)Monitor and document the total dose of lignocaineYes449 (67.9)Encountered possible signs of lignocaine toxicity after bronchoscopyYes109 (16.4)Not aware of the signs of lignocaine toxicity8 (1.2)	•		
10%15 (2.3)Others6 (0.9)Monitor and document theYes449 (67.9)total dose of lignocaineEncountered possible signsYes109 (16.4)of lignocaine toxicity afterNobronchoscopyNot aware of the signs of lignocaine toxicity			· · · ·
Others6 (0.9)Monitor and document the total dose of lignocaineYes449 (67.9)Encountered possible signs of lignocaine toxicity after bronchoscopyYes109 (16.4)No547 (82.4)S47 (82.4)Not aware of the signs of lignocaine toxicity8 (1.2)	0		
Monitor and document the total dose of lignocaineYes449 (67.9Encountered possible signs of lignocaine toxicity after bronchoscopyYes109 (16.4No547 (82.4Not aware of the signs of lignocaine toxicity8 (1.2)			
total dose of lignocaineYes109 (16.4Encountered possible signs of lignocaine toxicity after bronchoscopyNo547 (82.4Not aware of the signs of lignocaine toxicity8 (1.2)	Monitor and document the		
Encountered possible signs of lignocaine toxicity after bronchoscopyYes109 (16.4)No547 (82.4)Not aware of the signs of lignocaine toxicity8 (1.2)			(07.7)
of lignocaine toxicity after No 547 (82.4) bronchoscopy Not aware of the signs of lignocaine toxicity 8 (1.2)		Yes	109 (16 4)
bronchoscopy Not aware of the signs of 8 (1.2) lignocaine toxicity			
lignocaine toxicity			
	1.7		
		ž ž	Contd

Table 4: Contd.

Question	Responses	n (%)
Encountered any complications during bronchoscopy in the last 1 year	Yes	453 (68.8)
Bronchoscopy	Respiratory depression	34.7
complications (%)	Pneumothorax	41.7
	Bleeding	74.3
	Pulmonary edema	7.2
	Acute coronary syndrome	3.2
	Vasovagal attack	15.5
	Arrhythmia	15.1
	Convulsions/seizure	2.8
	Fever	40.9
	Airway obstruction	8.7
	Mortality	6.8
	Other	3.4

the major metropolitan cities. Nearly 70% bronchoscopists were working in multispecialty hospitals or as teaching faculty in medical colleges, indicating the requirement of sufficient resources for performing bronchoscopy. Most of the bronchoscopists had received training outside of their fellowship program. This underscores the need for developing and upgrading bronchoscopy training facilities across the country with standardized teaching curricula to promote consistency in bronchoscopy training.

The current study also highlights the variation in performance of bronchoscopy procedures as compared to the available literature. Several deviations were seen compared to current evidence.^[16] For instance, 17.7% were routinely administering antibiotics following bronchoscopy despite lack of evidence to support this practice. Routine monitoring of blood pressure during the procedure was not being performed by 27%. Nearly 60% of the bronchoscopists were performing flexible bronchoscopy without conscious sedation despite the fact that sedation improves the tolerance of bronchoscopy.^[17] The reasons may include the lack of adequate space in the postbronchoscopy recovery room to accommodate the large number of patients, lack of adequate trained staff, and others. However, the feasibility of performing bronchoscopy without sedation using a lower concentration of lignocaine (1%) has been well described.^[18] Comparing the findings of our survey with two recently published large surveys [Table 7], bronchoscopy without sedation is also the most common practice in Japan unlike Europe and the United States where most of the bronchoscopies are performed with significant amounts of sedation. ^[3,4,9] As part of premedication, the use of anticholinergic drugs and nebulized lignocaine for airway anesthesia was high. The current evidence does not support the use of anticholinergic premedication and nebulized lignocaine for bronchoscopy.^[17,19] The evidence against the use of nebulized lignocaine stems mostly from studies that used sedation in both the arms with and without nebulized lignocaine.^[17] Thus, there is a need for more data on the utility of nebulized lignocaine in bronchoscopy performed

Question

Clean the bronchoscope with

enzymatic solution or detergent

before and after bronchoscopy

Use scope cleaning brush for

Table 5: Procedural and technical aspects of flexiblebronchoscopy

Question	Responses	n (%)
Preferred route of	Nasal	623 (94.0)
bronchoscope introduction in awake patients	Oral	40 (6.0)
Hold bronchoscope in which	Left	538 (80.8)
hand	Right	128 (19.2)
Perform bronchial washings	Yes	657 (98.8)
or bronchoalveolar lavage		
Perform conventional TBNA	Yes	488 (74.2)
Perform EBB	Yes	603 (91.6)
Perform TBLB	Yes	508 (77.6)
Obtain bronchial brushings	Always	197 (29.6)
in visible endobronchial	Most of the time	162 (24.4)
growths	Sometimes	215 (32.3)
	Never	75 (11.3)
	Not applicable	16(2.4)
Obtain bronchial washings in visible endobronchial	Always Most of the time	362 (54.7) 125 (18.9)
growths	Sometimes	123 (18.9)
growins	Never	43 (6.5)
	Not applicable	13 (2.0)
Perform TBNA in which of	Mediastinal lymphadenopathy	220 (42.8)
the following situations	or peribronchial/paratracheal masses	220 (12.0)
	TBNA from endobronchial growths	23 (4.5)
	Both	271 (52.8)
Stations sampled using	Subcarinal	93.8
conventional TBNA (%)	Right paratracheal Other	65.4 7.7
Number of biopsy samples	Fewer than three	62 (9.9)
obtained during EBB	Three to four	396 (63.1)
	Five or more	169 (27.0)
Obtain CT scan before	Always	433 (66.8)
bronchoscopy in patients	Most of the time	166 (25.6)
suspected with lung cancer	Sometimes	47 (7.3)
	Never	2 (0.3)
Obtain EBB along with TBLB in patients with sarcoidosis undergoing bronchoscopy	Yes	395 (65.4)
Number of biopsy samples	Fewer than three	109 (19.5)
obtained during TBLB	Three to four	312 (55.8)
	Five or more	138 (24.7)
Use fluoroscopy while performing TBLB	Yes	84 (13.9)
Obtain chest X-ray following TBLB to exclude pneumothorax	Yes	494 (85.2)
Perform chest ultrasound following TBLB to exclude pneumothorax	Yes	101 (17.5)
Postbronchoscopy sputum analysis in patient with suspected TB	Yes	439 (67.8)

EBB: Endobronchial biopsy, TBLB: Transbronchial lung biopsy,

CT: Computed tomography, TBNA: Transbronchial needle aspiration, TB: Tuberculosis

without sedation. Nearly one-fourth of the respondents were administering transtracheal lignocaine injection, which was far larger than we anticipated.

In the current study, only 29.6% were regularly obtaining bronchial brush specimens in visible endobronchial growths

cleaning all the bronchoscope channelsNo27 (4.1 I don't knowDesignated area for bronchoscope cleaning and disinfectionI don't know18 (2.7 (2.7 Single use)Bronchoscope suction valves usedReusable511 (77. Single use)95 (14.4 I don't knowReuse of "single-use" bronchoscopeYes171 (26. Ves)suction valvesNo390 (60. I don't know390 (60. I don't knowImmerse the "entire" bronchoscope into the disinfectantYes456 (69. (71. cabinetPlace for storing bronchoscopeHang in storage Temperature others469 (71. cabinetBronchoscope valves attached during storageYes126 (19. don't knowMethod of performing scope disinfectionManually520 (79. don't knowMater used for rinsing bronchoscopeDistilled water235 (35.Water used for rinsing bronchoscopeDistilled water235 (35.
Designated area for bronchoscope cleaning and disinfectionYes517 (78.Bronchoscope suction valves usedReusable511 (77.Bronchoscope suction valves usedReusable511 (77.Single use95 (14.4)I don't know54 (8.2)Reuse of "single-use" bronchoscopeYes171 (26.suction valvesNo390 (60.I don't know79 (12.3)Immerse the "entire" bronchoscopeYes456 (69.into the disinfectantNo167 (25.I don't know24 (3.6.Others13 (2.0)Place for storing bronchoscopeHang in storage469 (71.cabinetIn bronchoscope149 (22.carrying caseTemperature39 (5.9)controlled cabinetOthers126 (19.during storageNo470 (71.during storageManually520 (79)disinfectionAutomated scope43 (6.5)cleanerBoth71 (10.8)I don't know21 (3.2)Others3 (0.5)
cleaning and disinfection Bronchoscope suction valves used Reuse of "single-use" bronchoscope suction valves No Immerse the "entire" bronchoscope into the disinfectant Place for storing bronchoscope Place for storing bronchoscope Bronchoscope valves attached during storage Method of performing scope disinfection Method of performing scope Manually Method of performing scope Manually Method of performing scope Both Method of performing scope Manually Method Sc
Bronchoscope suction valves usedReusable511 (77. Single use95 (14.4 I don't knowReuse of "single-use" bronchoscopeYes171 (26. Suction valves90 (60. I don't know390 (60. I don't knowImmerse the "entire" bronchoscopeYes456 (69. I don't know79 (12.3) I don't know24 (3.6 OthersPlace for storing bronchoscopeHang in storage469 (71. cabinetIn bronchoscopeHang in storage469 (71. cabinetIn bronchoscopeHang in storage469 (71. cabinetIn bronchoscopeI don't know24 (3.6 OthersOthers13 (2.0Place for storing bronchoscopeHang in storage469 (71. cabinetIn bronchoscopeI don't know24 (3.6 OthersBronchoscope valves attachedYes126 (19. Othersduring storageNo470 (71. Can't knowMethod of performing scopeManually520 (79. duisinfectionMethod of performing scopeManually520 (79. CleanerBoth71 (10.8) I don't know21 (3.2) OthersOthers3 (0.5)
Single use95 (14.4I don't know54 (8.2Reuse of "single-use" bronchoscopeYessuction valvesNoJmmerse the "entire" bronchoscopeYesinto the disinfectantNoIdon't know79 (12.3)Idon't know167 (25.1)I don't know24 (3.6)Others13 (2.0)Place for storing bronchoscopeHang in storageHang in storage469 (71.1)cabinetIn bronchoscopeIn bronchoscope149 (22.1)catinetIn bronchoscopeIdon't know61 (9.3)Method of performing scopeManuallydisinfectionAutomated scopeBoth71 (10.8)I don't know21 (3.2)Others3 (0.5)
Reuse of "single-use" bronchoscope suction valvesI don't know54 (8.2Reuse of "single-use" bronchoscope suction valvesYes171 (26.No390 (60.I don't know79 (12.3)Immerse the "entire" bronchoscope into the disinfectantYes456 (69.No167 (25.I don't know24 (3.6)Others13 (2.0)Place for storing bronchoscopeHang in storage469 (71. cabinetIn bronchoscopeHang in storage469 (71. cabinetIn bronchoscopeHang in storage39 (5.9) controlled cabinetOthers126 (19.during storageNo470 (71. I don't knowMethod of performing scopeManually520 (79 disinfectionMethod of performing scopeManually520 (79 don't knowBoth71 (10.8) I don't know21 (3.2) OthersOthers3 (0.5)
Reuse of "single-use" bronchoscope suction valvesYes171 (26.suction valvesNo390 (60.I don't know79 (12.3)Immerse the "entire" bronchoscope into the disinfectantYes456 (69.No167 (25.I don't know24 (3.6)Others13 (2.0)Place for storing bronchoscopeHang in storage cabinet469 (71.cabinetIn bronchoscope149 (22.carrying caseTemperature Others39 (5.9)controlled cabinet during storageNo470 (71.I don't know61 (9.3)149 (22.Method of performing scopeManually520 (79)disinfectionAutomated scope I don't know43 (6.5)cleanerBoth71 (10.8)I don't know21 (3.2)Others3 (0.5)
suction valves No No 390 (60, I don't know 79 (12.3) Immerse the "entire" bronchoscope into the disinfectant No 167 (25, I don't know 24 (3.6) Others 13 (2.0) Place for storing bronchoscope Hang in storage 469 (71, cabinet In bronchoscope 149 (22, carrying case Temperature 39 (5.9) controlled cabinet Others 4 (0.6) Bronchoscope valves attached Yes 126 (19, during storage No 470 (71, I don't know 61 (9.3) Method of performing scope Manually 520 (79) disinfection Automated scope 43 (6.5) cleaner Both 71 (10.8) I don't know 21 (3.2) Others 3 (0.5)
Immerse the "entire" bronchoscope into the disinfectantI don't know79 (12.3Immerse the "entire" bronchoscope into the disinfectantYes456 (69.No167 (25.I don't know24 (3.6Others13 (2.0Place for storing bronchoscopeHang in storage cabinet469 (71.In bronchoscopeIn bronchoscope149 (22.carrying caseTemperature Others39 (5.9)Controlled cabinetOthers4 (0.6)Bronchoscope valves attachedYes126 (19.during storageNo470 (71.I don't know61 (9.3)Method of performing scopeManually520 (79.disinfectionAutomated scope43 (6.5)cleanerBoth71 (10.8)I don't know21 (3.2)Others3 (0.5)
Immerse the "entire" bronchoscope into the disinfectantYes456 (69.No167 (25.I don't know24 (3.6Others13 (2.0Place for storing bronchoscopeHang in storage cabinet469 (71. cabinetIn bronchoscopeHang in storage carrying case469 (71. cabinetTemperature others39 (5.9) controlled cabinet39 (5.9) controlled cabinetBronchoscope valves attached during storageYes126 (19. (19.3)Method of performing scopeManually520 (79. cleanerBoth71 (10.8) (10.2) (1 don't know21 (3.2) (3.2) OthersBoth71 (10.8) (10.5)I don't know21 (3.2) (3.5)
into the disinfectant No 167 (25. I don't know 24 (3.6 Others 13 (2.0 Place for storing bronchoscope Hang in storage 469 (71. cabinet In bronchoscope 149 (22. carrying case Temperature 39 (5.9 controlled cabinet Others 4 (0.6) Bronchoscope valves attached Yes 126 (19. during storage No 470 (71. I don't know 61 (9.3 Method of performing scope Manually 520 (79. disinfection Automated scope 43 (6.5 cleaner Both 71 (10.8 I don't know 21 (3.2 Others 3 (0.5)
I don't know24 (3.6 (3.6) OthersPlace for storing bronchoscopeHang in storage (2.2) cabinet469 (71. (2.2) cabinetIn bronchoscope149 (22. (2.2) carrying case149 (22. (2.2) carrying caseTemperature (0.6)39 (5.9) controlled cabinetOthers4 (0.6)Bronchoscope valves attached during storageYesNo470 (71. I don't knowI don't know61 (9.3)Method of performing scopeManuallydisinfectionAutomated scopeBoth71 (10.8) I don't knowI don't know21 (3.2) OthersOthers3 (0.5)
Place for storing bronchoscopeOthers13 (2.0Place for storing bronchoscopeHang in storage469 (71. cabinetIn bronchoscope149 (22. carrying caseTemperature39 (5.9 controlled cabinetOthers4 (0.6)Bronchoscope valves attachedYesduring storageNoMethod of performing scopeManuallydisinfectionAutomated scopeBoth71 (10.8 I don't knowI don't know21 (3.2 OthersOthers3 (0.5)
Place for storing bronchoscopeHang in storage cabinet469 (71. cabinetIn bronchoscope149 (22. carrying case149 (22. carrying caseTemperature39 (5.9 controlled cabinet39 (5.9 controlled cabinetOthers4 (0.6)Bronchoscope valves attachedYes126 (19. don't knowduring storageNo470 (71. I don't knowMethod of performing scopeManually520 (79 disinfectiondusinfectionAutomated scope43 (6.5) cleanerBoth71 (10.8) I don't know21 (3.2) OthersOthers3 (0.5)
Place for storing bronchoscopeHang in storage cabinet469 (71. cabinetIn bronchoscope149 (22. carrying case149 (22. carrying caseTemperature39 (5.9 controlled cabinet39 (5.9 controlled cabinetOthers4 (0.6)Bronchoscope valves attachedYes126 (19. don't knowduring storageNo470 (71. I don't knowMethod of performing scopeManually520 (79 disinfectiondusinfectionAutomated scope43 (6.5) cleanerBoth71 (10.8) I don't know21 (3.2) OthersOthers3 (0.5)
cabinet In bronchoscope 149 (22. carrying case Temperature 39 (5.9 controlled cabinet Others 4 (0.6) Bronchoscope valves attached Yes 126 (19. during storage No 470 (71. I don't know 61 (9.3 Method of performing scope Manually 520 (79 disinfection Automated scope 43 (6.5 cleaner Both 71 (10.8 I don't know 21 (3.2 Others 3 (0.5)
carrying case Temperature39 (5.9 controlled cabinetOthers4 (0.6)Bronchoscope valves attachedYes126 (19.during storageNo470 (71.I don't know61 (9.3)Method of performing scopeManually520 (79disinfectionAutomated scope43 (6.5)cleanerBoth71 (10.6)I don't know21 (3.2)Others3 (0.5)
carrying case Temperature39 (5.9 controlled cabinetOthers4 (0.6)Bronchoscope valves attachedYes126 (19.during storageNo470 (71.I don't know61 (9.3)Method of performing scopeManually520 (79disinfectionAutomated scope43 (6.5)cleanerBoth71 (10.6)I don't know21 (3.2)Others3 (0.5)
Temperature controlled cabinet39 (5.9 controlled cabinetOthers4 (0.6)Bronchoscope valves attachedYes126 (19.during storageNo470 (71.I don't know61 (9.3)Method of performing scopeManually520 (79disinfectionAutomated scope43 (6.5)cleanerBoth71 (10.6)I don't know21 (3.2)Others3 (0.5)
controlled cabinet Otherscontrolled cabinet OthersBronchoscope valves attached during storageYes126 (19.during storageNo470 (71.I don't know61 (9.3Method of performing scopeManually520 (79disinfectionAutomated scope43 (6.5cleanerBoth71 (10.6I don't know21 (3.2Others3 (0.5)
Others4 (0.6)Bronchoscope valves attachedYes126 (19.during storageNo470 (71.I don't know61 (9.3)Method of performing scopeManually520 (79disinfectionAutomated scope43 (6.5)cleanerBoth71 (10.6)I don't know21 (3.2)Others3 (0.5)
Bronchoscope valves attached during storageYes126 (19.during storageNo470 (71.I don't know61 (9.3Method of performing scope disinfectionManually520 (79Automated scope cleaner43 (6.5Both71 (10.6I don't know21 (3.2Others3 (0.5)
during storageNo470 (71.I don't know61 (9.3)Method of performing scopeManually520 (79)disinfectionAutomated scope43 (6.5)cleanerBoth71 (10.6)I don't know21 (3.2)Others3 (0.5)
I don't know61 (9.3)Method of performing scopeManually520 (79)disinfectionAutomated scope43 (6.5)cleanerBoth71 (10.6)I don't know21 (3.2)Others3 (0.5)
Method of performing scope disinfectionManually Automated scope cleaner520 (79 43 (6.5 cleanerBoth71 (10.6 I don't know Others71 (10.6 3 (0.5)
disinfection Automated scope 43 (6.5 cleaner Both 71 (10.6 I don't know 21 (3.2 Others 3 (0.5)
cleaner Both 71 (10.8 I don't know 21 (3.2 Others 3 (0.5)
Both 71 (10.8 I don't know 21 (3.2 Others 3 (0.5)
I don't know 21 (3.2 Others 3 (0.5)
Others 3 (0.5)
water used for finising pronenoscope Distinct water 255 (55.
RO water 200 (30.
Tap water149 (22.Normal saline22 (3.4
Others $6(1.2)$
Agent for bronchoscope disinfection Glutaraldehyde 603 (91.
Other aldehyde based 41 (6.2
solution
I don't know 13 (2.0
Duration of bronchoscope <20 min 76 (11.5
immersion in the disinfectant 20 min or more 566 (85.
solution I don't know 18 (2.7
Awareness about bronchoscopeYes583 (89.
"leak testing" procedure
Bronchoscope "leak testing" Yes 457 (69.
performance as routine No 175 (26.
I don't know 28 (4.2
Alcohol rinse of the bronchoscope Yes 225 (34.
as the final step before storage No 348 (53.
I don't know 83 (12.6
HIV/hepatitis B/hepatitis C Always 215 (44.
screening for patients planned for Most of the time 78 (16.2
bronchoscopy Sometimes 141 (29.
Never 45 (9.3
Other responses 3 (0.6)

Table 6: Bronchoscope disinfection and staff protection

Responses

I don't know

Yes

No

Yes

n (%)

605 (92.1) 39 (5.9)

13 (2.0)

618 (93.2)

HIV: Human immunodeficiency virus, RO: Reverse osmosis

despite evidence that a combination of brush, biopsy, and needle aspiration provides the highest yields.^[20] This might indicate either a lack of awareness or an attempt to keep the procedural cost low. Most bronchoscopists have

Table 7: Comparison of the Indian Bronchoscopy Survey 2017 with other major bronchoscopy surveys

	ACCP survey	Japanese survey	German survey	Indian survey 2017 (current study)
Author/publication year	Prakash et al./1991	Asano et al./2013	Hautmann et al./2016	Madan et al./2017
Number of questionnaires responded	871 individuals	511 facilities	627 facilities/ individuals	669 individuals
Pulmonary physicians	98.2%	94.5%	100%	92.8%
Number of questions	39	NA	29	98
Perform rigid bronchoscopy	8.4%	18.5%	35%	19.5%
Performing bronchoscopy >10 years	58.0%	NA	71.3%	35.1%
Average number of annual procedures/ operator	115	NA	140	100
Most common mode of learning bronchoscopy		NA	In hospital by experienced	By experienced colleagues
			colleagues	
Perform pediatric bronchoscopy	13.2%	NA	NA	27.8%
Written informed consent before FB		96.8%	NA	91.7%
Routine prebronchoscopy spirometry	26.8%	18.3%	NA	3.6%
Routine prebronchoscopy arterial blood gas analysis	38.7%	9.3%	NA	2.8%
Routine prebronchoscopy coagulation	70.3%	64.5%	NA	26.2%
parameters Routine prebronchoscopy viral markers	NA	Hepatitis B, C: 77%	NA	44.6% for either
Routine prebionenoscopy vitar markers	INA	HIV: 13.8%	INA	hepatitis B, C or HIV
Antichalinargia promodication	83.2%	67.5%	15.4%	55.3% [#]
Anticholinergic premedication Prebronchoscopy bronchodilators in asthma				
patients	NA	76.2%	NA	97.2%#
Use of local anesthetics	NA	NA	79.4%	99.0%
Nebulized lignocaine	NA	51.2%	NA	72.4%
Most commonly used lignocaine	NA	2%	NA	2%
concentration	1 17 1	270	147 1	270
Intravenous sedation	73.9%#	36.1%	88%	40.6%
Preferred sedation regimen	Midazolam	Midazolam	Propofol and Midazolam	Midazolam with/without Fentany
Most common route of bronchoscope	Both oral and	Oral (>70%)	NA	Nasal (94.0%)
introduction	nasal (42.6%), nasal only (33.8%)	0101 (27070)	INA	14dSd1 ()+.070)
Pulse oximetry routinely	84.2%	99.0%	100%	99.4%
Oxygen administration routinely	88.9%	40.4%	95.2%	54.2%
Secure IV access routinely	76.7%	40.4% 66.1%	93.9%	34.2% 80%
	74.6%	59.9%	93.9% 76.3%	52.1%*
ECG monitoring		87.5%		
Noninvasive BP monitoring Routine antibiotic prophylaxis	NA NA	87.3% 20.5%	84.1% NA	73% 27%+
1 1 1			98.7%	
Perform BAL Perform EBB	76.8%	NA	98.7% 89.3%	98.8% 91.6%
	NA	NA		
Perform TBLB	68.8%	NA	71.8%	77.6%
Perform TBNA	11.8%	NA 28.50/	57.8%	74.2%
Perform EBUS-TBNA	NA	28.5%	36.3%	26.9%
Perform radial EBUS	NA	19.6%	10.1%	14.2%
Laser	11.3%	22.4%	16.8%	9.6%
APC	NA	25.4%	59.3%	NA
Cryotherapy	NA	NA	28.2%	13.8%
Stents	NA	NA	34.8%	16.2%-18.3%
Foreign body removal	NA	NA	79.6%	63.9%
Electrocautery	NA	31.5%	NA	25.4%
Perform chest radiograph as routine after TBLB	79%			
Fluoroscopy availability	20.9% had dedicated bronchoscopy fluoroscopy facility, 75.3% used it routinely during TBLB	99.8% centers with availability and regular use	NA	13.9% used fluoroscopy during TBLB
	,			
Routine wearing of protective clothing during				
all procedures	N A	20 00/	NI A	77 00/
	NA NA	38.9% 94.9%	NA NA	77.0% 92.8%

Contd...

Madan, et al.: Indian bronchoscopy survey (2017)

Table 7: Contd...

	ACCP survey	Japanese survey	German survey	Indian survey 2017 (current study)
Eye protection	NA	11.0%	NA	25%
Caps	NA	33.9%	NA	67.1%
Glutaraldehyde as primary disinfectant	NA	42.2%	NA	91.8%
Automated disinfectors for scope cleaning	NA	98.6%	NA	17.3%

*Either as a routine or most of the times, [#]Either as a routine or sometimes, ⁺Either before or after completing the procedure. NA: Information not available, IV: Intravenous, ECG: Electrocardiographic, BP: Blood pressure, BAL: Bronchoalveolar lavage, EBB: Endobronchial biopsy, TBLB: Transbronchial lung biopsy, TBNA: Transbronchial needle aspiration, EBUS: Endobronchial ultrasound, APC: Argon plasma coagulation, HIV: Human immunodeficiency virus, FB: Flexible bronchoscopy, ACCP: American college of chest physicians

Table 8: Comparison of the three bronchoscopy surveys conducted in India till 2017

	1994 survey, Nanjundiah S <i>et al</i> .	1999 survey, Nanjundiah <i>et al</i> .	2017 survey, Madan <i>et al.</i> (current study)
Number of questions	42	NA	98
Number of respondents	69	90	669
Population	Members of ICS and NCCP	Members of ICS and NCCP, associations of cardiothoracic and ENT surgeons	Members of ICS, NCCP and IAB
Area of specialization	Physicians 79.7% Surgeons 17.4%	Physicians 54.5% Surgeons 22.2%	Physicians 96.5%
Training outside India	Physicians 38.2% Surgeons 33.3%	NA	6.8%
Performing bronchoscopy >10 years	21.7%	44.4%	35.1%
Video bronchoscopy	4.3%	17.8%	80.8%
Performed rigid bronchoscopy	31.9%	50.6%	19.5%
Performed pediatric bronchoscopy	36.2%	NA	27.8%
Commonest area for performing FB	Hospital operation theater 68.1%	Hospital operation theater 53.3%	Bronchoscopy room 79.8%
Used anticholinergic premedication	79.7%	64.4%	55.3%
Routinely used intravenous sedation	8.6%	14.4%	40.6%
Routine intravenous access	18.8%	37.8%	80%
Routine ECG monitoring	10.2%	25.6%	39.1%
Transtracheal lignocaine administration	49.3%	46.7%	23.6%
Routine supplemental oxygen	24.6%	28.9%	54.2%
Routine pulse oximetry	14.5%	45.6%	99.4%
Routinely used fluoroscopy during TBLB	7.3%	8.9%	13.9%
Routine chest radiograph following TBLB	20.3%	30%	85.2%
Performed TBNA routinely	17.3%	26.7%	74.2%
Performed bronchoscopic biopsy	59.9%	86.7%	77.6%-91.6%
Average number of procedures per year	197	245	100
Laser bronchoscopy	1.4%	10%	9.6%
Stents	NA	2.2%	16.2%-18.3%
EBUS	NA	NA	26.9%
Electrocautery	NA	3.3%	25.4%
Cryotherapy	NA	3.3%	13.8%
Foreign body removal	26.1%	36.7%-46.7%	63.9%

NA: Information not available, EBUS: Endobronchial ultrasound, ICS: Indian chest society, NCCP: National College of Chest Physicians, IAB: Indian Association for Bronchology, ECG: Electrocardiographic, TBLB: Transbronchial lung biopsy, TBNA: Transbronchial needle aspiration, ENT: Ear, nose, and throat, FB: Flexible bronchoscopy

the perception that a biopsy alone would be sufficient in visible endobronchial growths. About 35% were not obtaining endobronchial biopsies routinely along with TBLB in patients with suspected sarcoidosis. Recent studies have demonstrated that a combination of TBNA (EBUS or conventional), TBLB, and EBB provides the best diagnostic yield in patients with sarcoidosis.^[21,22] Nearly three-fourth of the respondents were performing conventional TBNA which is an encouraging observation. Studies have demonstrated that conventional TBNA has a reasonable sensitivity,^[23] and when combined with rapid on-site cytological evaluation can provide diagnostic yields similar to EBUS-TBNA.^[24] The performance of chest radiograph following TBLB was very common (85.2%). British Thoracic Society guidelines recommend a chest radiograph following TBLB only if the patient is symptomatic or there is a clinical suspicion of pneumothorax. Only one-third of the respondents were performing therapeutic airway interventions such as thermoablative procedures and airway stents; fewer were performing EBUS-TBNA, rigid bronchoscopy, and radial EBUS. This indicates that there is an unmet need in training bronchoscopists in these advanced airway procedures.

The detailed questions regarding the disinfection protocol also provided important observations. Nearly one-fourth respondents were not practicing complete bronchoscope immersion into the disinfectant solution following bronchoscopy and a similar proportion were storing the bronchoscopes in the scope carrying case which is not a recommended practice and carries infection hazards.

We also compared the findings of our survey with the two previously published bronchoscopy surveys from India [Table 8] and other international surveys [Table 7]. The findings indicated that improvements have occurred as compared to the previous national surveys. The major improvements include the increased use of video bronchoscopy, routine securing of intravenous access, reduced anticholinergic premedication use, increased performance of TBNA, near always use of pulse oximetry, and increased performance of various therapeutic airway interventions.

Finally, our study is not without limitations. Although we had many respondents, the use of electronic survey might have precluded certain respondents since they may not be using the electronic media and possibility of a selection bias. Areas that were not covered in the survey included the opinion regarding training and competency requirements, details of the assisting staff, complication rates, and practices of management of various bronchoscopy complications. An even detailed survey questionnaire than the current one might have reduced the response rate; therefore, we focused only the key areas.

CONCLUSION

The results of this bronchoscopy survey suggest that there is an urgent need for standardizing the training curriculum to provide uniform training to the pulmonologists and trainee physicians pursuing the field of bronchology.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Ikeda S, Yanai N, Ishikawa S. Flexible bronchofiberscope. Keio J Med 1968;17:1-6.
- Du Rand IA, Blaikley J, Booton R, Chaudhuri N, Gupta V, Khalid S, et al. British Thoracic Society guideline for diagnostic flexible bronchoscopy in adults: Accredited by NICE. Thorax 2013;68 Suppl 1:i1-i44.
- Asano F, Aoe M, Ohsaki Y, Okada Y, Sasada S, Sato S, et al. Bronchoscopic practice in Japan: A survey by the Japan Society for Respiratory Endoscopy in 2010. Respirology 2013;18:284-90.
- Hautmann H, Hetzel J, Eberhardt R, Stanzel F, Wagner M, Schneider A, et al. Cross-sectional survey on bronchoscopy in Germany – The current status of clinical practice. Pneumologie 2016;70:110-6.

- 5. Nanjundiah S. Bronchoscopy in India 2005: A survey. J Bronchology Interv Pulmonol 2006;13:194-200.
- Zamboni M, Monteiro AS. Bronchoscopy in Brazil. J Bras Pneumol 2004;30:419-25.
- Madkour A, Al Halfawy A, Sharkawy S, Zakzouk Z. Survey of adult flexible bronchoscopy practice in Cairo. J Bronchology Interv Pulmonol 2008;15:27-32.
- Facciolongo N, Piro R, Menzella F, Lusuardi M, Salio M, Agli LL, et al. Training and practice in bronchoscopy a national survey in Italy. Monaldi Arch Chest Dis 2013;79:128-33.
- 9. Prakash UB, Offord KP, Stubbs SE. Bronchoscopy in North America: The ACCP survey. Chest 1991;100:1668-75.
- Honeybourne D, Neumann CS. An audit of bronchoscopy practice in the United Kingdom: A survey of adherence to national guidelines. Thorax 1997;52:709-13.
- 11. Smyth CM, Stead RJ. Survey of flexible fibreoptic bronchoscopy in the United Kingdom. Eur Respir J 2002;19:458-63.
- 12. Mansor AZ. Managing student's grades and attendance records using google forms and google spreadsheets. Procedia Soc Behav Sci 2012;59:420-8.
- Madan K, Agarwal R, Aggarwal AN, Gupta D. Therapeutic rigid bronchoscopy at a tertiary care center in North India: Initial experience and systematic review of Indian literature. Lung India 2014;31:9-15.
- Madan K, Mohan A, Ayub II, Jain D, Hadda V, Khilnani GC, et al. Initial experience with endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) from a tuberculosis endemic population. J Bronchology Interv Pulmonol 2014;21:208-14.
- Madan K, Dhooria S, Sehgal IS, Mohan A, Mehta R, Pattabhiraman V, et al. A multicenter experience with the placement of self-expanding metallic tracheobronchial Y stents. J Bronchology Interv Pulmonol 2016;23:29-38.
- Du Rand IA, Blaikley J, Booton R, Chaudhuri N, Gupta V, Khalid S, et al. Summary of the British Thoracic Society guideline for diagnostic flexible bronchoscopy in adults. Thorax 2013;68:786-7.
- Stolz D, Chhajed PN, Leuppi J, Pflimlin E, Tamm M. Nebulized lidocaine for flexible bronchoscopy: A randomized, double-blind, placebo-controlled trial. Chest 2005;128:1756-60.
- 18. Kaur H, Dhooria S, Aggarwal AN, Gupta D, Behera D, Agarwal R, *et al.* A randomized trial of 1% vs 2% lignocaine by the spray-as-you-go technique for topical anesthesia during flexible bronchoscopy. Chest 2015;148:739-45.
- 19. Malik JA, Gupta D, Agarwal AN, Jindal SK. Anticholinergic premedication for flexible bronchoscopy: A randomized, double-blind, placebo-controlled study of atropine and glycopyrrolate. Chest 2009;136:347-54.
- 20. Dasgupta A, Jain P, Minai OA, Sandur S, Meli Y, Arroliga AC, *et al.* Utility of transbronchial needle aspiration in the diagnosis of endobronchial lesions. Chest 1999;115:1237-41.
- 21. Madan K, Dhungana A, Mohan A, Hadda V, Jain D, Arava S, et al. Conventional transbronchial needle aspiration versus endobronchial ultrasound-guided transbronchial needle aspiration, with or without rapid on-site evaluation, for the diagnosis of sarcoidosis: A Randomized controlled trial. J Bronchology Interv Pulmonol 2017;24:48-58.
- Gupta D, Dadhwal DS, Agarwal R, Gupta N, Bal A, Aggarwal AN, et al. Endobronchial ultrasound-guided transbronchial needle aspiration vs. conventional transbronchial needle aspiration in the diagnosis of sarcoidosis. Chest 2014;146:547-56.
- 23. Sehgal IS, Dhooria S, Gupta N, Bal A, Ram B, Aggarwal AN, et al. Impact of endobronchial ultrasound (EBUS) training on the diagnostic yield of conventional transbronchial needle aspiration for lymph node stations 4R and 7. PLoS One 2016;11:e0153793.
- 24. Madan NK, Madan K, Jain D, Walia R, Mohan A, Hadda V, et al. Utility of conventional transbronchial needle aspiration with rapid on-site evaluation (c-TBNA-ROSE) at a tertiary care center with endobronchial ultrasound (EBUS) facility. J Cytol 2016;33:22-6.