COMMENTARY

Summarizing societal guidelines regarding bronchoscopy during the COVID-19 pandemic

Key words: bronchoscopy, COVID-19, infection control.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus responsible for pandemic coronavirus disease 2019 (COVID-19), is predominately transmitted via large droplets and fomites. However, healthcare workers (HCW) participating in aerosol-generating procedures such as bronchoscopy, endotracheal intubation, upper gastrointestinal endoscopy, otolaryngological procedures involving the upper airway and tracheotomy are also at risk for aerosol-transmitted infection. Given the well-documented asymptomatic SARS-CoV-2 infection with viral shedding, infectious aerosol might also be generated from asymptomatic patients as community prevalence rises.

Several bronchology societies have issued guidelines regarding bronchoscopy during the COVID-19 pandemic. However, none are comprehensive and significant uncertainty remains regarding in whom to perform bronchoscopy and how to perform it safely in this rapidly changing clinical environment. No data specific to bronchoscopy in COVID-19 are yet available, so most recommendations are expert opinion derived from observations made during prior respiratory viral outbreaks including SARS, Middle East respiratory syndrome (MERS) and influenza.

Tables 1 and 2 summarize existing guidelines regarding bronchoscopy in patients not suspected of harbouring SARS-CoV-2 and in those known or suspected to suffer from COVID-19, respectively. All societies reviewed recommend postponing elective procedures and limiting

Table 1  Bronchoscopy in patients without known or suspected COVID-19

| Organization | CMA | AABIP | DGP | SEPAR | AABE |
|--------------|-----|-------|-----|-------|------|
| Triage Acuity | Postpone elective | Postpone elective¹ | Postpone elective | Postpone elective | Postpone elective |
| Screening | Temperature, symptoms | Travel, symptoms | — | Temperature, symptoms, contacts | Symptoms, travel, sick contacts |
| Procedure Ideal setting | — | Negative pressure room² | — | Negative pressure room | — |
| Staff Limit personnel | Limit personnel | Limit personnel | Limit personnel | Limit personnel | — |
| Mask for patient Mask | Surgical; N95 if sick contact | N95¹ | Re-used N95³ | FFP2 or FFP3 depending on risk (e.g. sick contacts) | — |
| Eyes | Glasses or eye mask | Face shield | Eye protection | Eye protection | — |
| Other Anaesthesia Gown, gloves, cap | Gown, gloves | Gown, gloves | Gown, gloves | Gown, gloves | — |
| No atomized lidocaine | — | — | — | — | — |
| Approach | — | — | Flexible better than rigid | — | — |
| Ventilation | — | — | Avoid jet ventilation | — | — |

¹Specific indications considered elective by AABIP: mild airway stenosis, mucus clearance, suspect sarcoidosis but no indication for treatment, chronic ILD, suspect MAI, chronic cough, tracheobronchomalacia evaluation, bronchial thermoplasty and bronchoscopic lung volume reduction.

²If community prevalence is high.

³If community prevalence is high and supplies are low.

AABE, Argentinean Association for Bronchology; AABIP, American Association for Bronchology and Interventional Pulmonology; CMA, Respiratory Branch, Chinese Medical Association; COVID-19, coronavirus disease 2019; DGP, German Respiratory Society; ILD, interstitial lung disease; MAI, Mycobacterium avium-intracellulare; PPE, personal protective equipment; SEPAR, Spanish Society of Pneumology and Thoracic Surgery.

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the number of staff participating in any procedure to minimize the use of personal protective equipment (PPE) and reduce known or occult exposure to infectious aerosol. All considered known or suspected COVID-19 to be a relative contraindication to bronchoscopy, given the uncertainty of its benefit and clear risks to participating staff. Table 3 represents a consolidation of existing guidelines regarding bronchoscopy in patients with and without COVID-19.

In procedures which cannot be deferred, infection of HCW may occur from any of the three transmission modes discussed above. Protective measures against infectious aerosols include use of respirator-level respiratory protection, negative pressure rooms where feasible and avoidance of devices that purposefully produce aerosols including nebulizers or atomizers which can be contaminated with virus after a cough or sneeze with subsequent aerosolization. Recommendations to avoid open tube rigid bronchoscopy, jet ventilation and interruption of an otherwise closed ventilation circuit by repeatedly removing and reintroducing the bronchoscope are intended to reduce high-flow and high-shear conditions which generate aerosol droplets.

Measures protecting against droplet transmission include covering the patient’s nose and mouth with a simple medical mask (which can be slotted to permit transmask, transnasal or transoral flexible
bronchoscopy), minimizing cough pharmacologically, and a full complement of barrier PPE (gown, gloves, cap and wrap-around eye protection). Fomite transmission may be reduced by using disposable bronchoscopes in known COVID-19 patients, sterilizing surfaces which might have been contaminated by respiratory secretions or droplets, proper removal of PPE and meticulous hand hygiene. There appears to be a particular dearth of information regarding optimal post-procedure decontamination procedures.

Data specific to bronchoscopy in the COVID-19 era are urgently needed. National and international bronchology societies should work together to rapidly develop pertinent research endeavours and strive to provide their members with the most comprehensive and up-to-date recommendations possible. More than a few lives depend on them.

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Table 3 Summary considerations

|                     | Non-COVID patient                                                                 | COVID patient (known or suspected)                          |
|---------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------|
| **Triage**          | **Acuity or indications**                                                         | **Postpone elective**                                       |
|                     | **Screening**                                                                     | **See footnote**                                            |
| **Procedure**       | **Ideal setting**                                                                 | **Negative pressure room**                                  |
|                     | **Staff**                                                                         | **Essential personnel only**                                |
|                     | **Mask for patient**                                                              | **PAPR (superior protection), N95 or FFP3**                 |
| **PPE**             | **Mask**                                                                          | **N95 or FFP3 if significant community prevalence**        |
|                     | **Eyes**                                                                          | **Gown, gloves, cap**                                      |
|                     | **Other**                                                                         | **Avoid atomized or nebulized lidocaine**                   |
|                     | **Anaesthesia**                                                                   | **Sedation to minimize cough**                              |
|                     |                                                                                   | **Consider paralysis to minimize cough in general anaesthesia** |
| **Equipment**       | **Approach**                                                                      | **Avoid rigid bronchoscopy**                                |
|                     |                                                                                   | **Avoid rigid bronchoscopy**; minimize flexible scope in/out |
| **Ventilation**     | **Closed-circuit ventilation if advanced airway; avoid jet**                     | **Closed-circuit ventilation if advanced airway; avoid jet** |
| **Post-procedure**  | **Scope disinfection**                                                            | **Standard high level**                                     |
|                     | **Room disinfection**                                                             | **Consider air circulation time per local air controls**   |
|                     |                                                                                   | **Consider sterilizing surfaces**                           |

1 Specific indications considered elective by AABIP: mild airway stenosis, mucus clearance, suspected sarcoidosis without indication for immediate treatment, chronic interstitial lung disease, suspected Mycobacterium avium-intracellulare, chronic cough, tracheobronchomalacia evaluation, bronchial thermoplasty and bronchoscopic lung volume reduction.

2 Possible indications: inconclusive non-invasive COVID-19 testing2–5; concern for an alternate aetiology of respiratory disease which would change management2–5 (especially in immunocompromised4); suspicion of superinfection4; lobar or entire lung atelectasis concerning for mucus plugging4; facilitate tracheostomy4; life-saving or emergent intervention (significant haemoptysis, severe central airway obstruction or stenosis, foreign body).2–5

3 Consider phone screening 1–2 days in advance.

4 Unless unavoidable in the clinical circumstance.

AABIP, American Association for Bronchology and Interventional Pulmonology; COVID-19, coronavirus disease 2019; PAPR, powered air-purifying respirator; PPE, personal protective equipment.
this work has been previously published nor is under consideration by any other journals. Early drafts of included tables were previously shared among a small group of airway professionals via non-public social media.

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