In the past few decades, there has been a steady increase in the detection of lung nodules. The advent of lung cancer screening, the wide-spread use of computed tomography (CT), and our aging population have played an important role in this increased incidence. During the initial assessment of these patients, based on expert clinical judgement or use of clinical risk calculator, physicians place patients in three main categories: low, intermediate, or high risk of lung cancer. These categories will help determine –among other factors– which nodules will be observed, which nodules will require a biopsy, and which ones will directly undergo surgical resection. Once we decide a biopsy is needed, we face another difficult decision: the optimal method of biopsy.

There are three main methods of obtaining a biopsy of a lung nodule: surgical biopsy (i.e. wedge biopsy), percutaneous CT-guided fine needle aspiration (CT-FNA), and bronchoscopic biopsy. Surgical biopsy has the highest yield and it is the only method to accurately rule out a malignancy in cases of benign diagnosis. However, it also has the highest morbidity and mortality, and deeply seated nodules cannot be accessed. Unless we are caring for patients who are excellent surgical candidates and have a high pre-test probability of lung cancer, this method is typically reserved as the last resort. The most commonly utilized technique to biopsy lung nodules continues to be CT-FNA. It has been practiced for decades and its yield is relatively high even with smaller lung nodules. The down-side of CT-FNA being the risk of pneumothorax, and the inability to provide staging information.

The rapid advances in the field of bronchoscopy that we have experienced in this century have given this technique an essential role in the management of lung cancer and lung nodules. A true revolution was the advent of convex-probe or linear-array endobronchial ultrasound (EBUS). This technology has allowed us to accurately and safely sample any target in contact with the major airways (where the EBUS scope can be inserted), and it has become, indeed, the main stem of mediastinal staging for lung cancer. As you will witness while reading this publication, this revolution was followed by the development of multiple bronchoscopic technologies that allow us to travel into the periphery of the lungs. Navigation bronchoscopy essentially utilizes a virtual 3-dimensional airway model created from pre-bronchoscopy CT images in synchronization with the video bronchoscope with or without electromagnetic guidance. Once navigation is deemed to be successful, real-time confirmation is typically performed with the use of radial-probe EBUS. When the target has been reached, sampling under fluoroscopic guidance can be performed with a myriad of tools. Technical aspects of multiple different navigation techniques are thoroughly reviewed for our readers in this book. These advances have allowed bronchoscopy to become a popular method to sample lung nodules because it can now provide both diagnosis and staging with a quite favorable safety profile.

This enthusiasm of bronchoscopists who now play a major role in both diagnosis and staging of lung cancer has led investigators to push the boundaries and venture into the remaining field: lung cancer therapeutics. The recent increase in diagnosis of medically inoperable early-stage lung cancer demands the use of local non-surgical ablative techniques. While the standard of care is Stereotactic Body Radiation Therapy (SBRT), this technology is costly, some patients are not candidates due to prior radiation or tumor location, and some series have reported relatively high rates of local recurrence. Percutaneous CT-guided thermal ablation has been available for decades with acceptable oncologic results, but unfortunately with relatively high morbidity. For safety, efficacy, and cost-effective purposes, multiple bronchoscopic methods for treatment of peripheral lung tumors are currently under exploration and some will be reviewed here. It is the dream of many of us, bronchoscopists, that bronchoscopy will at some point become a one-stop shop for diagnosis, staging, and treatment of lung cancer.

Roberto F. Casal, MD
Department of Pulmonary Medicine,
The University of Texas M.D. Anderson Cancer Center,
Houston, TX, USA