MaHTAS
Malaysian Health Technology Assessment Section

Executive Summary
[Adapted from the report by DR JUNAINAH SABIRIN]

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Background
A good assessment of the wall structure and nearby abnormalities can be important for staging and therapeutic decision making, especially in the case of malignant airway disorders. More physicians are turning to the promising technique of endobronchial ultrasonography. By adding ultrasonic capability to a bronchoscope, this technique makes it possible to view lesions and tumour around the bronchi as well as on the luminal surfaces of the airway. EBUS guided transbronchial aspiration (EBUS-TBNA) improved the results of N-staging of lung cancer, especially in difficult lymph node levels without any clear endoscopic landmarks. The possibility of identifying N2 and N3 stages by means of a nonsurgical procedure can modify the management of lung cancer and decrease the number of unnecessary surgical interventions. EBUS can reduce the need for more invasive procedures such as thoracoscopy or mediastinoscopy. With EBUS, the delicate multilayer structure of the bronchial wall can be analyzed. This knowledge became decisive for the management of early cancer in the central airways.

Technical Features
Miniaturized probes were developed that can be inserted through the biopsy channels of regular fiberoptic bronchoscopes. The probes are constructed with balloons at the tip. By filling the balloon with water, close contact to the bronchial wall is established and water can transmit the sound waves at 360 degrees into the surrounding structures and a resolution well below 1 mm and a penetration depth of up to 4 cm can be achieved with a 20-MHz probe. This is sufficient to examine all the structures necessary for local staging. BF-UC160F-OL8 & BF-UC260F-OL8 Ultrasonic Bronchofibervideoscope which is specifically designed for ultrasound-guided TBNA procedures are able to provide clear visualisation of a dedicated echogenic aspiration needle under ultrasound imaging, confirming the position of the needle tip during TBNA procedures. Furthermore, the Power Doppler facility allows the blood flow conditions to be checked before puncturing.

Policy Question
Should EBUS be made available in Regional Respiratory Centres in Malaysia?

Objective
The objective of this report is to assess the clinical and economic implications of EBUS.

Methods
Electronic database were searched for published literatures pertaining to EBUS. The searches included PUBMED, OVID, Proquest, Cochrane databases, Food and Drug Administration (FDA) and HTA databases and related links. Google was used to search for additional web-based information. When necessary, hand search was done for articles not retrieved via the internet. The search was limited to studies from 1999 to 2007. There was no limitation to language.

Result and conclusion
In conclusion there was good level of evidence to show that:

i. EBUS is safe and minimally invasive. The complication rate is extremely low and several studies did not report any complication at all.

ii. EBUS offered more accurate information regarding the depth of the tumour invasion than did bronchoscopy or HR-CT.

iii. EBUS-guided TBNA added little time but increased the diagnostic yield significantly compared to conventional TBNA in stations other than subcarinal nodes.

iv   The detection rate of successful biopsies leading to correct prediction of lymph node staging in lung cancer is higher with EBUS-TBNA than it is with other modalities. It should be considered for staging mediastinal lymph nodes as well for diagnosis of lung cancer.

v.   The diagnostic accuracy of EBUS-guided transbronchial lung biopsy for peripheral pulmonary lesions or solitary pulmonary nodules is higher than other modalities.

vi.   It is effective for localizing and diagnosing bronchoscopic occult pulmonary masses ≥ 20 mm and for localizing and diagnosis of solitary pulmonary nodules that cannot be visualized by fluoroscopy.

vi   Diagnosis obtained by EBUS-guided TBNA / EBUS-guided TBB averted the need for more surgery.

vii   EBUS improves the safety of therapeutic procedures and can assist in decision making.

However, there is no retrievable evidence on the cost-effectiveness of EBUS.

Recommendation

It is recommended that EBUS be used for diagnosis and staging of lung cancer. It can also be used for interventional bronchoscopy. EBUS should be made available in Regional Respiratory Centres in Malaysia. However, centres utilizing this technology should have trained personnel to ensure that the available technology will not be underutilized and cost effective.