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ORIGINAL ARTICLE

# Utilization review and reimbursement of cytology services in endobronchial ultrasound-guided procedures: challenge and opportunity

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**Introduction** The roles of pathologists and cytotechnologists (CTs) continually evolve to optimize patient care, particularly with regard to rapid on-site evaluation (ROSE). Having ROSE performed helps ensure sufficient material is obtained for diagnosis and permits appropriate specimen triage for ancillary studies. At our institution, both on-site and telecytology evaluations are increasingly utilized, particularly in endobronchial ultrasound-guided procedures (EBUS). Consequently, time demands placed on the pathologist and CT staff has significantly increased, creating workload management challenges.

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Endobronchial ultrasound-guided procedures (EBUS)

**Material and methods** A consecutive number of ROSE procedures were documented for a 3-month time period at our institution. Case type and time spent for travel, adequacy assessment, processing, screening, and sign-out was recorded in order to assess time demands placed on staff by different procedures.

**Results** Average travel/processing time by CTs was variable among ROSE procedures (72.9 minutes), as was adequacy assessment time by pathologists (16.9 minutes). EBUS posed the greatest time challenges with the longest CT travel/processing time as EBUS took almost 40% longer and adequacy assessment took the pathologist 3-4 times longer when compared with other procedures because of the targeting of multiple sites during EBUS with associated procedural delays. Using telecytology, average pathologist adequacy assessment time was reduced from 44.8 minutes to 24.6 minutes for EBUS. The provision of ROSE for EBUS is more challenging from a workload management perspective than for other procedures.

**Conclusions** ROSE reimbursement is low, and no greater for EBUS than for other procedures. Use of telecytology can save time for pathologists and make the service more cost-effective if the number of procedures is sufficient to justify investment in the technology.



## Introduction

Technological advancement continually redefines the roles of physicians and support staff. One such example in cytopathology has been the changing role of pathologists and cytotechnologists (CTs) in adequacy assessment since the implementation of rapid on-site evaluation (ROSE) for fine needle aspiration (FNA) procedures.[1] FNA performance rests on specimen adequacy,[2] and some studies have shown up to one-third are nondiagnostic when ROSE is not utilized[3,4]; an unfortunate and costly consequence requiring repeat procedures for appropriate diagnostic work-up.

ROSE provides an advantage over the non-ROSE FNA procedure by permitting "real-time" evaluation of procured material during the procedure. It can be determined if the desired target is being adequately sampled, enabling the physician performing the FNA to make additional passes if necessary.[5] ROSE also allows for preliminary information to be relayed to the physician/clinical team and specimen triage for ancillary testing when appropriate.[5] Ancillary tests can include flow cytometry, microbiology studies, molecular testing, and cell block preparations when immunocytochemical or special stains are desired. Clinical studies have validated these advantages.[2,6] Furthermore, mathematical models and large meta-analyses have indicated ROSE procedures require fewer passes and yield a superior per-case adequacy rate across all targeted sites. As such, ROSE is frequently implemented to improve patient care and efficacy by optimizing procedural adequacy rates.[2,7-10]

Although ROSE has been shown to be accurate and cost-effective when performed by experienced pathologists,[9-11] the overall cost-effectiveness does not translate to reduced cost to the cytopathology department, as sending staff to the procedure takes time away from other obligations. It has been recognized that the significant time commitment required is not suitably compensated,[12,13] which escalates departmental cost as less staff time is available for other responsibilities, including direct patient care.

The current economics of health care require hospitals and their departments to increase efficiency. The pathologist has a recognized role in driving and developing high-value, cost-effective care in the clinical laboratory.[14] Clearly, a similar role exists in the cytopathology department. One possible way to improve efficiency is by implementing telecytology (TC).[13,15] Doing so enables the pathologist to provide ROSE while remaining in their office or sign-out area during adequacy assessment,[16] minimizing time away from other duties[13] while maintaining high diagnostic accuracy.[1,16-19] Taking these issues into consideration, we evaluated time demands placed on our cytopathology staff and looked at departmental cost and reimbursement associated with ROSE in an effort to develop the most efficient means of providing the service at our institution while maintaining quality.

## Materials and methods

In our institution, ROSE has been performed in two different ways. The first entails the CT and pathologist traveling to the procedure suite and the second is performed via TC where either two CTs or a CT and a cytopathology fellow travel to the procedure. When TC is used, the CT prepares slides while the cytopathology fellow or second CT transmits real-time video images to the cytopathology department for the pathologist to simultaneously review. This is done using an Olympus BX41 microscope (Tokyo, Japan) mounted on a cart and outfitted with a Leica DFC495 model camera (Wetzlar, Germany) with 8-megapixel resolution; live video images are transmitted via a laptop with an Internet connection using Google Chrome (Mountain View, Calif) Remote Desktop viewing software and a Microsoft Windows 7 (Redmond, Wash), 32-bit operating system. The approximate cost of the entire cart set-up including the microscope, camera, and computer is $5000. The pathologist is in direct communication with the cytopathology fellow or second CT via telephone so microscopic findings can be discussed. Protected health information is transmitted by telephone only, not through the Internet connection, to protect patient confidentiality. When specimen adequacy and a preliminary diagnosis are