

Cytopathology and More | FNA cytology: Rapid on-site evaluation—how practice varies

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May 2014—Rapid on-site evaluation, or ROSE, is a service that pathologists and cytotechnologists commonly perform to check the cellular content and adequacy of fine-needle aspiration smears and biopsy touch imprints. ROSE can inform the operator of the need to obtain additional samples and, in this cost-conscious age, make it possible to avoid having to repeat the procedure. ROSE allows for preliminary diagnosis so that additional material can be requested for ancillary studies such as flow cytometry, microbiology cultures, or molecular studies. Numerous studies and editorials describe the advantages of ROSE; a few review articles and articles addressing cost-effectiveness are referenced here.¹⁻³

ROSE is well described for FNA samples in many clinical circumstances and from many body sites, including transbronchial,^{4,5} percutaneous lung,⁶ thyroid,⁷⁻¹⁰ pancreas,¹¹ sentinel lymph nodes in breast cancer,¹² and melanoma.¹³ It has been used in both adult and pediatric populations.^{14,15} ROSE methodology varies, especially in the type of stain used.²⁰⁻²³ Usually a selected smear slide is evaluated, but touch imprints are also widely used for the immediate evaluation of core biopsies, such as for the evaluation of breast lesions¹⁹ and other tumors.

Many studies have focused on the impact of ROSE on FNA sample adequacy. For example, when ROSE is used, fewer passes for endobronchial ultrasound (EBUS)-guided FNA are obtained,¹⁶ and fewer repeat procedures for endoscopic ultrasound (EUS) FNA of the pancreas are performed.¹¹ A recent meta-analysis of studies analyzing the impact of ROSE on adequacy found an overall improvement of 12 percent in adequacy rates when ROSE is used, but the magnitude of the change varies in relation to the initial adequacy rate without ROSE.^{17,18} The studies at sites that started with high adequacy rates before ROSE was implemented showed less improvement after ROSE was implemented, suggesting that the benefit of ROSE is operator dependent. That is, the added value of ROSE is inversely proportional to the skill of the clinician performing the procedure: The more adept the clinician operator is at hitting the target and obtaining diagnostic cells, the less impact ROSE for adequacy will have.

Who should perform ROSE is a subject of ongoing discussion and debate. Some cytopathologists have been reluctant to employ ROSE because of unreimbursed time spent in the procedure suite waiting for a radiologist or clinician to provide cellular material to examine. Pathologists often feel that ROSE is not a profitable service, and that in a busy practice their time is better spent at the microscope signing out case material. A recent study showed that compensation for ROSE is about \$42 per hour, compared with that for reading surgical biopsies, at about \$556 per hour. The authors concluded there is a steady decline in reimbursement and an increase in the time spent providing ROSE, and that although pathologists fully understand its significance and that patient care decisions should not be based on compensation alone, the affordability of ROSE is questionable from a business perspective.³²

Findings at a glance

- ◆ 37 respondents
- ◆ 35 perform ROSE on at least some FNAs, one-third for all FNAs.
- ◆ Romanowsky stain is most commonly used, followed by H&E.
- ◆ ROSE slides are generally prepared on site in clinic or procedure suite.
- ◆ Nine pathologists use telecytology; most bill for the service.
- ◆ Cytotechnologists participate in ROSE, according to two-thirds of respondents.

Telepathology increases the efficiency of ROSE through the transmission of static images, videomicroscopy, or whole scanned slides to the pathologist for remote review.²⁹⁻³¹

In some institutions, cytotechnologists and pathology trainees are the only professionals to perform ROSE despite the inadmissibility of billing for their services. Cytotechnologists may provide only a determination of adequacy, and not a preliminary diagnosis. Still, ROSE performed by cytotechnologists for the determination of adequacy is effective. At one large institution, cytotechnologists had a high rate of accuracy for determining adequacy (overall 95 percent).²⁴ In the future, cytotechnologists might take on a greater role in ROSE as the demand for ROSE increases, particularly as medical reimbursement moves away from fee-for-service payment.²⁵

A more controversial question is whether endocrinologists and other physicians can perform and bill for ROSE. ²⁶⁻²⁸ Currently, most non-pathologist physicians are not able to charge a professional fee for ROSE because the Centers for Medicare and Medicaid Services has ruled that ROSE is a laboratory test that must be performed in accordance with the mandates of the Clinical Laboratory Improvement Amendments.

As members of the CAP Cytopathology Committee, we were interested in the variations in the use of ROSE procedures in different laboratories. We conducted a small, nonrandom survey of practices at the home institutions of our colleagues on the Cytopathology Committee and other selected sites. We had 37 respondents from public and private institutions (22 academic/public hospitals, 15 private institutions). All but two perform rapid assessment for both adequate cellularity and diagnostic evaluation for a preliminary diagnosis. The clinicians who submit FNA samples to the two laboratories (one academic, one private) in which ROSE is not performed have adopted measures to obtain adequate cellularity, and the laboratories report a low unsatisfactory rate. The pathologist working in the private lab also reported offering occasional educational sessions for clinicians to demonstrate good FNA smearing techniques, thus promoting a continued high adequacy rate.

Of the laboratories that offer ROSE, about one-third do so for all FNAs performed. The vast majority use a Romanowsky stain, about one-third use hematoxylin and eosin, and very few use toluidine blue or Papanicolaou stains. Most respondents offer ROSE for all types of superficial FNA sites, including thyroid, as well as samples obtained by interventional radiology. Most offer ROSE for EBUS and EUS, but few of the respondents perform ROSE for transbronchial FNA without ultrasound guidance.

The ROSE slides are usually prepared on site in the clinic or suite where the procedure is performed. Most often the stains and microscope are kept on a cart, but more than half of the institutions also have a permanent site dedicated to ROSE. More than half of the respondents provide feedback by reviewing the ROSE slides with the operator who performed the FNA. Only nine of 35 pathologists report using telecytology, most of whom had no special technical expertise in videomicroscopic capture and transmission but did have access to technical support. Of those who perform telecytology, the majority bill for the service.

More than two-thirds of the respondents report that cytotechnologists participate in ROSE, and for about half of

those respondents, the cytotechnologist assists on all ROSE cases. Five of the eight laboratories in which only the pathologist performs ROSE are in a private practice setting.

ROSE results are reported most commonly in person, less often by phone. The ROSE result (adequacy and preliminary evaluation) appears in the final pathology report. Most respondents do not incorporate ROSE results into quality assurance data. Almost every lab requires a “time out” for FNA procedures, which consists of confirming patient identity and procedure site.

The results of this survey highlight the trends in ROSE performance among a group of cytopathologists in academic and private practice. While this sample is small and the data are preliminary, the results illustrate the variation in ROSE practice and raise a number of questions. Which anatomic sites undergoing FNA benefit most from ROSE? Are standardized, universally accepted adequacy guidelines needed? Who should perform ROSE (cytotechnologist, pathologist, radiologist, or other clinician), especially as we move away from the fee-for-service model of payment? Will ROSE be a sustainable practice even with a reduction in reimbursement rate? We hope these unresolved questions can be addressed in future studies of the CAP Cytopathology Committee.

1. Silverman JF, Finley JL, O'Brien KF, et al. Diagnostic accuracy and role of immediate interpretation of fine needle aspiration biopsy specimens from various sites. *Acta Cytol.* 1989;33:791–796.
2. Gupta PK, Baloch ZW. Intraoperative and on-site cytopathology consultation: utilization, limitations, and value. *Semin Diagn Pathol.* 2002;19:227–236.
3. Nasuti JF, Gupta PK, Baloch ZW. Diagnostic value and cost-effectiveness of on-site evaluation of fine-needle aspiration specimens: review of 5,688 cases. *Diagn Cytopathol.* 2002;27:1–4.
4. Davenport R. Rapid on-site evaluation of transbronchial aspirates. *Chest.* 1990;98:59–61.
5. Shannon JJ, Bude RO, Orens JB, et al. Endobronchial ultrasound-guided needle aspiration of mediastinal adenopathy. *Am J Respir Crit Care Med.* 1996;153:1424–1430.
6. Fassina A, Corradin M, Zardo D, et al. Role and accuracy of rapid on-site evaluation of CT-guided fine needle aspiration cytology of lung nodules. *Cytopathology.* 2011;22:306–312.
7. Baloch ZW, Tam D, Langer J, et al. Ultrasound-guided fine-needle aspiration biopsy of the thyroid: role of on-site assessment and multiple cytologic preparations. *Diagn Cytopathol.* 2000;23:425–429.
8. Ghofrani M, Beckman D, Rimm DL. The value of onsite adequacy assessment of thyroid fine-needle aspirations is a function of operator experience. *Cancer.* 2006;108:110–113.
9. Redman R, Zalaznick H, Mazzaferri EL, Massoll NA. The impact of assessing specimen adequacy and number of needle passes for fine-needle aspiration biopsy of thyroid nodules. *Thyroid.* 2006;16:55–60.
10. Witt BL, Schmidt RL. Rapid onsite evaluation improves the adequacy of fine-needle aspiration for thyroid lesions: a systematic review and meta-analysis. *Thyroid.* 2013;23:428–435.
11. Collins BT, Murad FM, Wang JF, Bernadt CT. Rapid on-site evaluation for endoscopic ultrasound-guided fine-needle biopsy of the pancreas decreases the incidence of repeat biopsy procedures. *Cancer Cytopathol.* 2013;121:518–524.
12. van Rijk MC, Deurloo EE, Nieweg OE, et al. Ultrasonography and fine-needle aspiration cytology can spare breast cancer patients unnecessary sentinel lymph node biopsy. *Ann Surg Oncol.* 2006;13:31–35.
13. van Rijk MC, Teertstra HJ, Peterse JL, et al. Ultrasonography and fine-needle aspiration cytology in the preoperative evaluation of melanoma patients eligible for sentinel node biopsy. *Ann Surg Oncol.* 2006;13:1511–1516.
14. Silverman JF, Gurley AM, Holbrook CT, Joshi VV. Pediatric fine-needle aspiration biopsy. *Am J Clin Pathol.* 1991;95:653–659.

15. Anne S, Teot LA, Mandell DL. Fine needle aspiration biopsy: role in diagnosis of pediatric head and neck masses. *Int J Pediatr Otorhinolaryngol*. 2008;72:1547–1553.
16. Collins BT, Chen AC, Wang JF, Bernadt CT, Sanati S. Improved laboratory resource utilization and patient care with the use of rapid on-site evaluation for endobronchial ultrasound fine-needle aspiration biopsy. *Cancer Cytopathol*. 2013;121:544–551.
17. Schmidt RL, Walker BS, Howard K, Layfield LJ, Adler DG. Rapid on-site evaluation reduces needle passes in endoscopic ultrasound-guided fine-needle aspiration for solid pancreatic lesions: a risk-benefit analysis. *Dig Dis Sci*. 2013;58:3280–3286.
18. Schmidt RL, Witt BL, Matynia AP, Barraza G, Layfield LJ, Adler DG. Rapid on-site evaluation increases endoscopic ultrasound-guided fine-needle aspiration adequacy for pancreatic lesions. *Dig Dis Sci*. 2013;58:872–882.
19. Klevesath MB, Godwin RJ, Bannon R, et al. Touch imprint cytology of core needle biopsy specimens: a useful method for immediate reporting of symptomatic breast lesions. *Eur J Surg Oncol*. 2005;31:490–494.
20. Silverman JF, Frable WJ. The use of the Diff-Quik stain in the immediate interpretation of fine-needle aspiration biopsies. *Diagn Cytopathol*. 1990;6:366–369.
21. Yang GC, Alvarez, II. Ultrafast Papanicolaou stain. An alternative preparation for fine needle aspiration cytology. *Acta Cytol*. 1995;39:55–60.
22. Sakuma T, Mimura A, Tanigawa N, et al. Rapid on-site cytologic examination of 1500 breast lesions using the modified Shorr's stain [published online ahead of print June 4, 2013]. *Breast Cancer*.
23. Thierry R, Marie-Christine R, Mariele M, Richard B, Anca M. Modified technique of toluidine blue staining in rapid on-site evaluation. *Diagn Cytopathol*. 2012;40:847–848.
24. Burlingame OO, Kesse KO, Silverman SG, Cibas ES. On-site adequacy evaluations performed by cytotechnologists: correlation with final interpretations of 5241 image-guided fine-needle aspiration biopsies. *Cancer Cytopathol*. 2012;120:177–184.
25. Stelow EB. Who should perform rapid or on-site assessment of thyroid fine-needle aspirations? *Am J Clin Pathol*. 2012;138:8–9.
26. Savoy AD, Raimondo M, Woodward TA, et al. Can endosonographers evaluate on-site cytologic adequacy? A comparison with cytotechnologists. *Gastrointest Endosc*. 2007;65:953–957.
27. Hikichi T, Irisawa A, Bhutani MS, et al. Endoscopic ultrasound-guided fine-needle aspiration of solid pancreatic masses with rapid on-site cytological evaluation by endosonographers without attendance of cytopathologists. *J Gastroenterol*. 2009;44:322–328.
28. Renshaw AA. 88172 is more than counting cells: ensuring the quality of immediate assessment of fine-needle aspiration material. *Am J Clin Pathol*. 2012;138:27–28.
29. Marotti JD, Johncox V, Ng D, Gonzalez JL, Padmanabhan V. Implementation of telecytology for immediate assessment of endoscopic ultrasound-guided fine-needle aspirations compared to conventional on-site evaluation: analysis of 240 consecutive cases. *Acta Cytol*. 2012;56:548–553.
30. Khurana KK, Kovalovsky A, Masrani D. Feasibility of telecytopathology for rapid preliminary diagnosis of ultrasound-guided fine needle aspiration of axillary lymph nodes in a remote breast care center. *J Pathol Inform*. 2012;3:36.
31. Pantanowitz L, Wiley CA, Demetris A, et al. Experience with multimodality telepathology at the University of Pittsburgh Medical Center. *J Pathol Inform*. 2012;3:45.
32. Mehrotra S, Barkan GA, Wafai RM, et al. Rapid on-site evaluation (ROSE)—is it affordable to provide this service? *Mod Pathol*. 2014; 27(suppl 2):112A–113A.

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