

# The Rate of False Negative Rapid Cytology Interpretations (ROSE) in the Pulmonary Lab at Providence Health Center in 2014-2015

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## Research Question

What is the Rate of False Negative Rapid On-Site Evaluation (ROSE) Cytology Interpretations in the Pulmonary Lab at Providence Health Center in 2014-2015?

## Primary Objective

To determine the rate of false negative rapid cytology interpretations at Providence Health Center.

## Abstract

According to the American Cancer Society, lung cancer is the leading cause of cancer death among both men and women in the U.S. Many patients with lung lesions suspicious for malignancy undergo bronchoscopy with biopsy of the lesion to determine if the lesion is cancerous. Rapid On-Site Evaluation (ROSE) of endobronchial lesions involves sending the biopsy sample for preliminary rapid pathology results during the bronchoscopy procedure. Having reliable pathology results during the procedure allows the physician to make decisions about the need for additional biopsies. For this retrospective study, charts were reviewed on all patients who underwent bronchoscopy with ROSE biopsy during 2014-2015 at Providence Health Center. During this 2 year period, 316 ROSE samples were sent for preliminary rapid interpretation and the false negative rate was 18%.

## Background Information

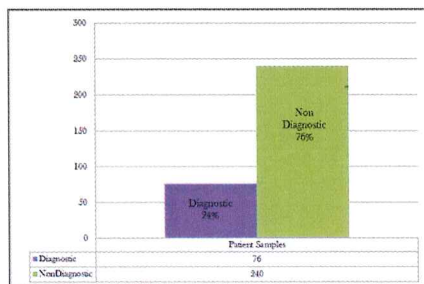
Lung cancer is the second most common cancer among men and women in the United States and is the leading cause of cancer death. Bronchoscopy with biopsy is one method for diagnosing a suspicious lesion found on x-ray or CT scan. A standard biopsy will produce a diagnosis within a few days however, a Rapid On-Site Evaluation (ROSE) biopsy will produce preliminary pathology results during the procedure. Accurate ROSE results are useful to help the physician make decisions about additional biopsies, procedures, and potential treatment options.

## Methods

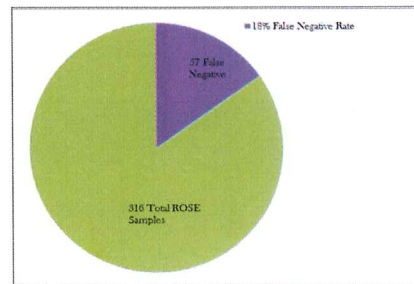
A retrospective data collection study was conducted to determine the rate of false negative interpretations for ROSE biopsies in 2014-2015 at Providence Health Center. 316 ROSE samples were sent for preliminary rapid interpretation during this 2 year period. Patients that had a bronchoscopy performed without a ROSE biopsy were excluded, as well as patients under 18 years of age. ROSE samples were sent to the pathology lab and preliminary rapid results were given to the physician by phone. Students collected basic demographic information, preliminary rapid results, final rapid results, and the preliminary rapid results dictated by the physician in the procedure notes. These results were sorted into the categories of Malignant (M), Benign (B), Suspicious (S), Atypical (A), and Indeterminate (I). Patient samples were determined to be diagnostic if a diagnosis was given through the pathology assessment, as malignant or as another disease, or non-diagnostic if no diagnosis was determined. These results were compared to see how often the preliminary and final rapid results were in concordance (see table) and how often the preliminary rapid result was not malignant but the final pathology was malignant.

## Results

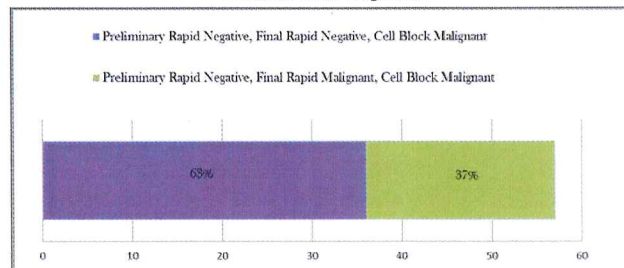
Rate of Diagnosis for ROSE



Rate of False Negatives for ROSE



Basis for False Negatives



Accuracy of the Preliminary Rapid Result to the Final Rapid Result

| Preliminary Rapid | Final Rapid |           |            |           |          |            |
|-------------------|-------------|-----------|------------|-----------|----------|------------|
|                   | B           | M         | A          | S         |          |            |
| B                 | 22          | 0         | 15         | 1         | 0        | 38         |
| M                 | 0           | 65        | 0          | 0         | 1        | 66         |
| I                 | 56          | 6         | 86         | 4         | 1        | 153        |
| A                 | 1           | 19        | 1          | 32        | 1        | 54         |
| S                 | 1           | 1         | 0          | 4         | 0        | 6          |
|                   | <b>80</b>   | <b>91</b> | <b>102</b> | <b>41</b> | <b>3</b> | <b>316</b> |

Preliminary Rapid and Final Rapid Match

B - Benign I - Indeterminate S - Suspicious  
M - Malignant A - Atypical

## Conclusion

- The study found a false negative rate of 18%
  - 24 % of the samples were diagnostic of malignancy
  - Rate of non-diagnostic samples was 76%
- These results show a substantial false negative rate in the ROSE samples processed at Providence Health Center, signifying the importance of a final pathological diagnosis.

### Limitations:

- Rapid slides were transported to the pathology/cytology lab for reading rather than reading in the bronchoscopy room.
- There was a lack of standardized nomenclature to report cytological findings.

## Citation

- "Cancer Prevention and Control." Centers for Disease Control and Prevention. <http://www.cdc.gov/cancer/kinds.htm>
- "Lung Biopsy." Lung Disease & Respiratory Health Center. <http://www.webmd.com>.
- "Lung Cancer Fact Sheet." American Lung Association. <http://www.lung.org/lung-disease/lung-cancer/resources/facts-figures/lung-cancer-fact-sheet.html>.

## Acknowledgments

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