Lung cancer, the leading cause of death due to malignancy worldwide, is often diagnosed by exfoliative and aspiration cytologic specimens. This presentation will discuss different selected topics on this subject including our abilities to distinguish among the different cell types of carcinomas. This will emphasize cytomorphologic attributes that permit the separation of small cell carcinoma from nonsmall cell tumors, and between adenocarcinoma and squamous cell carcinoma. The cytologic attributes of the neuroendocrine neoplasms will be presented. A systematic exam of the levels of diagnostic sensitivity and specificity for different types of respiratory cytologic samples will be discussed; the value of rapid onsite evaluation will be incorporated into this discussion. A nuclear grading system for adenocarcinoma in fine needle aspiration biopsies will be offered. Finally, the application of molecular analyses of cytologic specimens for driver mutations will be introduced.