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## **Chromoendoscopy and Magnification Endoscopy for Diagnosing Esophageal Cancer and Dysplasia**

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Michael J. Connor and Prateek Sharma

Two primary subtypes of esophageal carcinoma are commonly seen in the esophagus: squamous cell carcinoma and adenocarcinoma. Currently, the diagnosis of metaplastic and dysplastic mucosa within the esophagus requires endoscopy with biopsy of abnormal-appearing tissue. Current practices of performing standard endoscopy with random biopsies are inaccurate. Magnification and chromoendoscopy are among several tools used in the esophagus to improve detection of squamous cell dysplasia/cancer, Barrett's esophagus, and associated dysplasia. Current studies show that these techniques are promising, although the results are still preliminary. These techniques will hopefully improve detection rates, decrease the number of biopsies required, and ultimately provide a real-time diagnosis.

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Stanley J. Goldsmith, Lale A. Kostakoglu, Serge Somrov, and Christopher J. Palestro

Over the past decade a variety nuclear medicine imaging studies have become available that are of considerable value to patients who have pulmonary malignancies. By far the greatest impact on the management of patients who have thoracic malignancy has been the availability of 18-flouro-deoxyglucose (18FDG-PET) imaging. In the patient who has newly diagnosed lung carcinoma, 18FDG-PET improves the accuracy of staging the disease by identifying or excluding mediastinal disease and distant metastatic foci. 18FDG-PET is superior to anatomic methods for evaluating the response to therapy and for distinguishing recurrent disease from posttreatment changes. Studies are in progress to evaluate the role of 18FDG-PET imaging in assessing prognosis.

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Arfa Khan, Aaron Darius Cann, and Rakesh D. Shah

Pulmonary embolism (PE) is a significant cause of morbidity and mortality after surgical procedures. Early diagnosis and prompt, effective management of this condition present considerable clinical challenges to surgeons. Imaging studies form the mainstay of diagnosis of PE and include plain radiography, ventilation-perfusion scan, venography, echocardiography, catheter pulmonary angiogram, CT pulmonary angiogram, and MR pulmonary angiogram. Each imaging modality has a role in the diagnosis of PE.

## **Computer-Aided Diagnostics**

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Anthony P. Reeves and Bryan M. Kressler

This article reviews the role of the computer in assisting physicians in interpreting CT images of the lungs. Four primary computer functions are considered: visualization, detection, characterization and diagnosis, and whole-lung documentation and health

evaluation. Computer-aided methods are emerging to aid the radiologist in the tasks of disease detection and diagnosis. Such methods might also be suitable to aid the surgeon in preoperative planning, the surgical operation, and postsurgical evaluation.

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The article outlines some of the recent technological advances that will drive future CT evolution and describes the recently enabled applications and trends in thoracic imaging. Future technological developments in CT imaging will result in improvements in spatial resolution, coverage, temporal resolution, and dose reduction. The key to realizing this potential is to combine improved imaging capability with advanced computer-assisted tools, which will expand the usefulness of CT imaging in many areas. This article discusses examples of state-of-the-art and emerging clinical application using CT in the areas of lung cancer, chronic obstructive pulmonary disease, pulmonary embolism, and interventional procedures.

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