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Exploring new protocols in emergency radiology, and their impact on radiation and diagnosis

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AKADEMISK AVHANDLING

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ABSTRACT

Computed tomography (CT) has become the predominant radiological examination in thoracic and abdominal emergencies. The increasing use of CT, both for diagnosis and follow-up and the continued development of the CT technique demand that we improve our examination protocols constantly. The aim of this thesis has been to explore new examination protocols and to study their effect on diagnosis and on radiation dose to the patient.

Papers I and II evaluate protocol modifications of abdominal CT. In Paper I, focused abdominal and pelvic CT were assessed to find out if the examination could be limited (i.e. focused) to the area of interest based on the patients symptoms. In patients with symptoms and signs suggestive of upper abdominal disease, the results indicate that CT can be limited to this area. In patients with symptom from the lower abdomen this may, however, not be true because of the phenomenon of referred pain and CT of the whole abdomen could therefore be indicated.

In Paper II, the use of enteral contrast agent was evaluated in patients with suspected appendicitis. Enteral contrast agents administered rectally, orally or both did not differ from the diagnostic results of the protocol with CT performed without enteral contrast. Thus there is no need for delay and/or breaking the patient's fast before surgery by administration of enteral contrast.

In Papers III and IV, low dose (sometimes referred to ultra low dose) thoracic CT (LDCT) was studied. In Paper III LDCT was compared with normal dose chest CT in patients admitted to the intensive care unit and in Paper IV, LDCT was compared to bedside chest X-ray in emergency patients. Both studies demonstrated high accuracy and reliability of LDCT for diagnosis of chest disease in the emergency setting.