

AbstractID: 13233 Title: Radiation Dose of Patient Receiving CTA and CTP Studies of Brain.

**Purpose:** As radiation injury to patients undergoing CT perfusion study of brain was reported in the media, the radiation dose delivered to our own patients receiving the same procedures was being questioned by attending radiologists, physicians and surgeons. The purpose of this paper is to investigate the radiation dose delivered to the stroke patients receiving CT angiography and CT perfusion study of brain at our institution.

**Materials and Methods:** The Landauer CT dosimeter utilizing aluminum oxide, optically stimulated luminescence (OSL) technology, was employed as the radiation detector to measure the radiation dose profile in the standard CTDI head phantom simulating the patient. We performed a CT perfusion acquisition using our clinical protocol (fixed tube current mode, no mA-modulation). Radiation dose was measured at the 12 O'clock and in the central position to simulate the retina or brain. Measurements were performed for those three component scans in the stroke study; (a) a non-contrast scan of the brain, (b) a perfusion scan with contrast (the shuttle mode), and (c) a CT angiography (CTA) scan.

**Results:** The total dose for the skin exposure (at 12 O'clock), and the retina/brain (in the center) were 85 mGy and 70 mGy for scan series (a), and 300 mGy and 230 mGy for scan series (b), and 60 mGy and 60 mGy for scan series (c), respectively. A total skin dose of 445 mGy and brain dose of 360 mGy have been obtained.

**Conclusion:** The results show it is quite possible to reach the erythema dose of 2000 mGy if the same patient had gone through more than 4 times the same procedure. While we were assured that the CTA/CTP procedure at this institution is less than 500 mGy/procedure, it is also prudent to exercise precautionary measures to minimize the radiation as a ongoing practice.