

### **Radiation Exposure Reduction Using 128 VS 64 MDCT for Coronary Evaluation in A Chest Pain Unit Setup**

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#### **Introduction:**

Coronary CT angiography (CCTA) is used daily in the triage of patients (pts) in the chest pain unit (CPU). However, the radiation entailed in CCTA is not negligible. CCTA using prospective ECG gating ("Step and shoot"- S&S) enables significant radiation reduction. The 128 multi-detector CT (MDCT) opens new scanning possibilities. The purpose of this work is to determine whether the routine use of 128 VS 64 MDCT can reduce the radiation exposure entailed with CCTA in the CPU.

#### **Subjects and methods:**

S&S was performed whenever possible. 128 MDCT inclusion criteria: stable heart rate (HR) < 70/min and weight < 140 Kg. 64 MDCT inclusion criteria: stable heart rate (HR) < 60/min and weight < 110 Kg.

The study comprised 232 consecutive patients; 116 pts scanned using 128 MDCT (mean age 49; 80 males; mean HR 57; mean weight 83 Kg) and a cohort of 116 consecutive patients; scanned using 64 MDCT, during the period immediately preceding the installation of the 128 MDCT scanner (mean age 50; 76 males; mean HR 59; mean weight 82 Kg); All 15 coronary segments were evaluated for image quality using a visual scale of 1-5. An estimated radiation dose was recorded.

#### **Results**

"Step and shoot" was performed in 84% of the 128 MDCT group as compared with 49% in the 64 MDCT group ( $p < 0.0001$ ). The mean radiation dose exposure using 128 MDCT was  $6.2 \pm 4.8$  mSv compared with  $10.4 \pm 7.5$  mSv using 64 MDCT;  $P$  value = 0.008. The radiation exposure for each scanning technique including: "step and shoot", "step and shoot" with 5% tolerance, retrospective ECG gating and dose modulation, were lower for the 128 MDCT group. No significant differences were found in image quality scores (average score  $4.6 \pm 0.3$  and  $4.7 \pm 0.1$  for 128 and 64 MDCT, respectively,)

#### **Conclusion**

128 MDCT CCTA allows significant radiation dose reduction, without hampering image quality. This noteworthy exposure decrease is of major importance especially in the relatively young CPU population.