

## **Task-based assessment on various optimization protocols of computed tomography Pulmonary Angiography examination**

### **ABSTRACT**

This prospective study was designed to assess CT performance by using the task-based image quality assessment and to identify the influence of iterative reconstruction (IR) algorithm, tube potential and pitch factor selection on dose and image quality during Computed Tomography Pulmonary Angiography (CTPA) examination. An image quality phantom, Catphan-600 was utilized in this study for assessing the image quality of CTPA protocols under 128-multislice CT scanner (Philips Brilliance iCT, USA). The standard CTPA protocols were altered on its tube potential, pitch factor and iterative reconstruction algorithm (IR). Three different levels of iDose, an IR algorithm were measured in this study. The result was presented in term of signal to noise ratio (SNR), contrast to noise ratio (CNR), noise power spectrum (NPS) and target transfer function (TTF). A massive improvement of the CNR and distortion of noise texture were observed with increasing the IR algorithm level. Noise value reduction was significantly achieved by increasing the tube potential selection although there are no changes in TTF values. The alteration of pitch factor provides some fluctuation on both NPS and TTF values. In conclusion, the task-based measurement was performed, and this technique allow for characterizing the image quality with a different type of quantitative measurement for local CTPA protocols.

**Keyword:** CTPA; NPS; TTF; CNR; Task-based