

## Retrospective estimation of patient dose-area product in thoracic spine tomosynthesis performed using VolumeRAD

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**Purpose:** For a tomosynthesis examination performed using the VolumeRAD system (GE Healthcare, Chalfont St. Giles, UK), the scout image is normally the only image stored in the picture archiving and communication system (PACS) that contains dose data in the digital imaging and communications in medicine (DICOM) header. Recently, a method of retrospectively estimating the patient dose-area product (DAP) of a chest tomosynthesis examination performed using the VolumeRAD system from DICOM data available in the scout image was presented (Båth et al, Med Phys 2014). The purpose of the present work was to evaluate the application of the method to thoracic spine tomosynthesis.

**Material and Methods:** DICOM data for the projection radiographs acquired during the examination were retrieved directly from the modality for 17 patients undergoing thoracic spine tomosynthesis with VolumeRAD. Using information about how the exposure parameters for the tomosynthesis examination are determined by the scout image, an estimated DAP for the tomosynthesis examination was determined from DICOM data in the scout image. Based on comparing the estimated DAP with the actual DAP registered for the projection radiographs acquired during the tomosynthesis examination, a correction factor for the adjustment in field size with projection angle was determined.

**Results:** The field-size correction factor for thoracic spine tomosynthesis was determined to 0.92. Applying this factor to the DAP estimated retrospectively from the scout image, the maximum difference between the estimated DAP and the actual DAP was smaller than 3% for all patients.

**Conclusions:** The previously developed method of retrospectively estimating the DAP of a chest tomosynthesis examination performed using the VolumeRAD system from DICOM data in the scout image can be applied also to thoracic spine tomosynthesis. The method may thus be of value for retrospectively estimating patient dose in clinical use of thoracic spine tomosynthesis.