



# AI FOR PNEUMOTHORAX (PTX) DETECTION & IMPROVED WORKFLOW PRODUCTIVITY

## MEDICAL FIELD, OR MEDICAL METHOD

Radiology / Trauma & ER / Surgery

## TYPE

Decision support  Autonomous decision making

## CATEGORY

Prevention  Detection  Diagnosis  Treatment  
 Other

## DESCRIPTION

The Critical Care Suite (CCS) and Quality Care Suite (QCS) are optional computer-aided triage and notification software from GE Healthcare.

The CCS Suite is a suite of algorithms that analyses frontal chest X-Ray images to identify those cases with a critical finding (pneumothorax) and enables case prioritisation at PACS.

The QCS includes a set of algorithms to determine whether the acquired X-ray image is a frontal chest image and whether lung coverage is adequate. It will automatically rotate the frontal chest image where the image found to be tilted (i.e. not heads up).

The CCS employs on-device Artificial Intelligence (AI), which brings awareness to the technologist on the user interface of cases that are flagged for review by the radiologist.

The CCS notifies radiologists of cases with a suspected critical finding – Pneumothorax via PACS worklist image flag and secondary capture DICOM image.

## AIM / PURPOSE

AI-based algorithm embedded on-device and the point of

care, which analyses frontal chest X-Ray images to identify those cases with a critical finding (pneumothorax) and enables case prioritisation at PACS for the Radiologist.

## OUTPUT / RESULTS

The CCS can detect almost all large PTXs (96%) and 3 out of 4 small PTXs (75%), with limited false alerts (94% specificity).<sup>2</sup>

The CCS's overall accuracy for detecting a pneumothorax with AP patient positioning is 0.96 (Area Under Curve).<sup>2</sup>

- Large PTXs are detected with extremely high accuracy (AUC = 0.99).<sup>2</sup>
- Small PTXs are detected with high accuracy (AUC = 0.94).<sup>2</sup>

## AI METHODOLOGY

Convolutional Neural Network

## INPUT / SIZE OF THE DATA

CCS's PTX AI Algorithm was trained on >12,000 unique patient images, from 6 data sources, in 3 countries using 11 different x-ray detector manufacturers, including CR and DR with an even split between fixed (PA) vs. portable (AP) systems – using the strongest form of annotation (pixel level and image level).

## REFERENCE DOCUMENTS / LINKS / PUBLICATIONS

[www.gehealthcare.com/criticalcaresuite](http://www.gehealthcare.com/criticalcaresuite)

## SOURCE

GE Healthcare