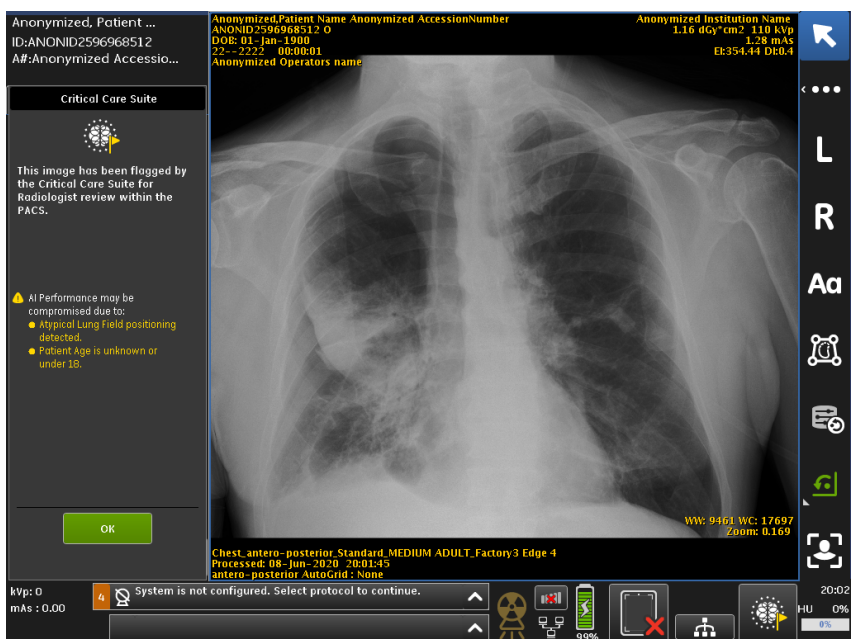
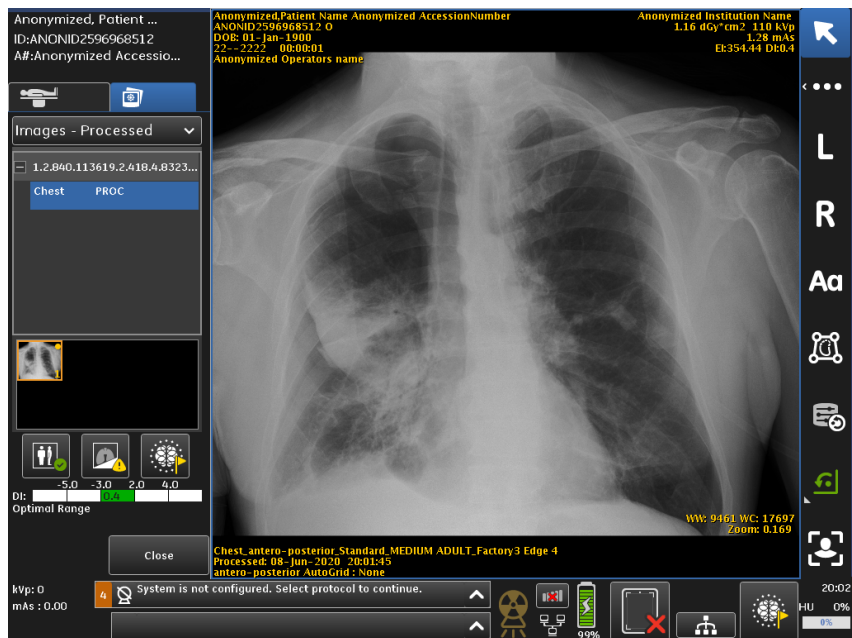




Critical Care Suite *Standard*

PRODUCT DATA SHEET*

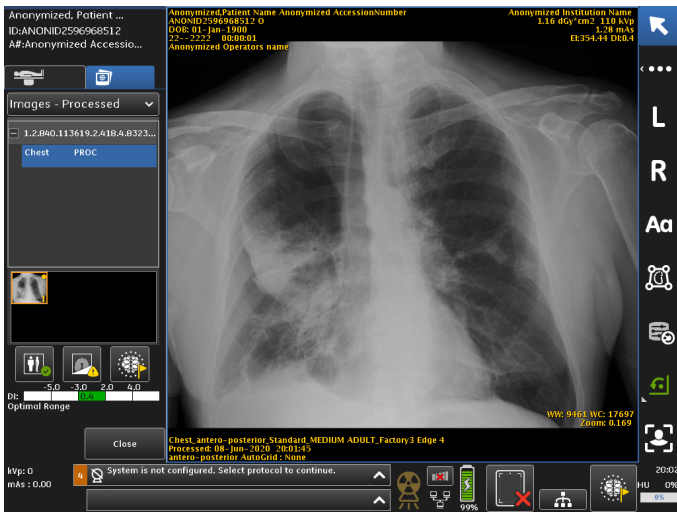


Overview

In today's clinical workflow, technologists inconsistently detect and address protocol errors and patient positioning errors, while radiologists are overburdened by long PACS worklists, cluttered with STAT exams, causing slow turnaround times for radiologist reports.

GE's Critical Care Suite (CCS) enabled with Quality Care Suite (QCS), employs a collection of AI algorithms designed to identify and flag images to technologists that are suspicious for quality issues, and to radiologists for suspicious critical findings. The system also brings AI findings in the form of a notification to the technologist and radiologist, without disrupting their workflow.

Both QCS and CCS are designed as a software upgrade to the AMX 240 mobile x-ray system as well as the Definium 646 HD and Definium 656 HD fixed x-ray systems.



Optima XR240amx with Quality Care Suite and Critical Care Suite

Quality Care Suite (QCS)¹

Comprised of three AI algorithms, QCS conducts automated quality checks to detect errors on the acquisition system, thus enabling the technologist to become immediately aware of possible errors which could be corrected before sending the image to PACS.

Intelligent Protocol Check detects if the acquired image is a frontal chest x-ray (AP/PA). The user receives a notification if a mismatch exists between the image acquisition protocol and the acquired image.

Intelligent Auto Rotate determines the rotation angle of a chest image and auto-rotates the image for proper display (head-up).

Intelligent Field of View detects whether the lung field is complete in the image. If the algorithm identifies that the lung field is incomplete, a notification is provided to the user.

Critical Care Suite (CCS)^{1,3}

Identifies images with pneumothorax (PTX) in a frontal chest x-ray (AP/PA) to enable case prioritization or triage in the PACS via a set of configurable public DICOM tags.

Mod	AI Findings (UH)	Medical ... Name	Date and time	Currently...	Residentrow (...)	M...	Body part	Referring unit	Exp
1	No Finding		1/22/2020, 9:48 AM				CR TH CHEST 1 VIEW		0
1	No Finding		1/22/2020, 9:30 AM				CT TH TH CT CHEST LOW D...		0
1	No Finding		1/22/2020, 8:38 AM				CR TH CHEST 1 VIEW		0
1	No Finding		1/22/2020, 2:31 AM				CR TH CHEST 1 VIEW		0
1	Suspicious Fin...		1/22/2020, 4:54 AM				CR TH CHEST 1 VIEW		0
1	No Finding		1/22/2020, 5:08 AM				CR TH CHEST 1 VIEW		0
1	No Finding		1/22/2020, 5:16 AM				CR TH CHEST 1 VIEW		0
2	No Finding		1/22/2020, 5:22 AM				CR TH CHEST 1 VIEW		0
1	No Finding		1/22/2020, 5:30 AM				CR TH CHEST 1 VIEW		0
3	No Finding		1/22/2020, 6:15 AM				CR TH CHEST 1 VIEW		0
1	No Finding		1/22/2020, 6:16 AM				CR TH CHEST 1 VIEW		0
1	No Finding		1/22/2020, 6:18 AM				CR TH CHEST 1 VIEW		0

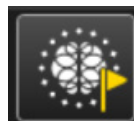
Sectra IDS7 Ver21.1 PACS Worklist with example of CCS Image Flag

- Achieves high accuracy (AUC = 96%)² in detection of PTX.
- A vendor-neutral/agnostic algorithm with similar performance on AP and PA images from mobile and fixed X-ray systems.
- In addition to the public DICOM tags, the user may also configure the system to send the Pneumothorax AI results to PACS, in the form of a secondary capture DICOM.



Critical Care Suite Secondary DICOM - AI Results Pushed to PACS

- An on-device notification⁴ indicating that Critical Care Suite has flagged a study in the PACS worklist for a prioritized radiologist review is displayed to the technologist 15 minutes after exam closure and transfer to PACS.



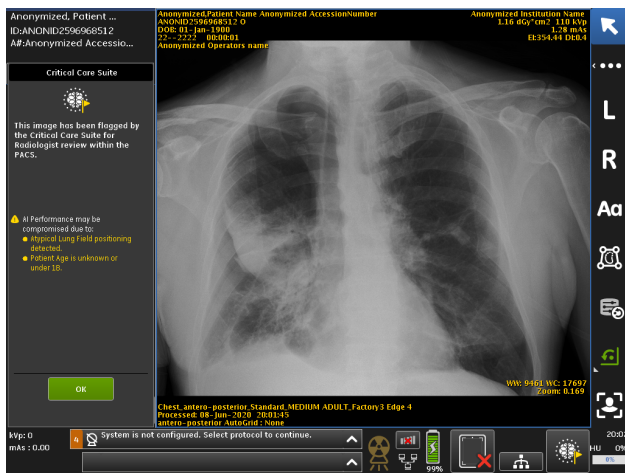
On-device notification to Technologist that exam has been flagged by Critical Care Suite (See ICON within system user interface below).

¹CCS and QCS are indicated for adult-size patients

²AUC (area under the curve) of the ROC (receiver operating curve) is an aggregate performance metric across all possible AI thresholds.

³CCS should not be used in-lieu of full patient evaluation or solely relied upon to make or confirm a diagnosis. It is not intended to replace the review of the x-ray image by a qualified physician.

⁴The technologist on-device notification is generated after a delay, post exam closure, and it does not provide any diagnostic information, nor is it intended to inform any clinical decision, prioritization, or action.



Critical Care Suite On-Device Notification - Exam Viewer (15 mins. after PACS image flag is sent)

- On-device notification⁴ of exams flagged for prioritized review also available within system image management screen (15 minutes after exam closure).

Algorithm Performance Data

Quality Care Suite (QCS)

The **Intelligent Protocol Check** has extremely high performance, ensuring ~99% of mismatches between the acquired image and the acquisition protocol for frontal (AP/PA) chest X-rays are detected. If the frontal chest image is acquired using a non-chest protocol, the algorithm will alert the technologist to the protocol mismatch through an on-device flag, however, the system will still recognize the image as a frontal chest and run Critical Care Suite.

Intelligent Protocol Check AI Algorithm Performance	
Sensitivity	98.17% (96.91%, 99.42%)
Specificity	99.79% (99.39%, 100%)
AUC	99.70% (99.35%, 100%)

The **Intelligent Field of View** has very high performance, ensuring that ~96% of frontal chest x-rays with clipped lung fields are properly flagged with an on-screen notification for the technologist to review.

Intelligent Field of View AI Algorithm Performance	
Sensitivity	96.17% (94.63%, 97.70%)
Specificity	94.83% (93.06%, 96.60%)
AUC	99.10% (98.57%, 99.63%)

The **Intelligent Auto Rotate** algorithm has very high performance, ensuring that ~99% of frontal chest x-rays are correctly rotated to an upright (head-up) orientation automatically, without requiring any manual intervention by a technologist.

Intelligent Auto Rotate AI Algorithm Performance	
Sensitivity	99.39% (99.24%, 99.52%)
Specificity	99.80% (99.75%, 99.84%)
AUC	99.70% (99.60%, 99.70%)

Critical Care Suite (CCS)

AUC (area under the curve) of the ROC (receiver operating curve) is an aggregate performance metric across all possible AI thresholds. The pneumothorax detection algorithm has strong performance with an AUC of 96%, which is for AP and PA images combined, as well as consistent performance of AUC of 96% for AP images alone or PA images alone, demonstrating the algorithm's robustness regardless of system type (mobile or fixed).

Pneumothorax AI Algorithm AUC of the ROC	
Patient Position (System Type)	AUC (95% Confidence Interval)
AP + PA (Mobile + Fixed)	96.07% (94.91%, 97.24%)
AP (Mobile)	96.18% (94.69%, 97.67%)
PA (Fixed)	95.59% (93.58%, 97.60%)

Small PTXs are detected with high AUC accuracy, while large PTXs are detected with very high AUC accuracy.

Pneumothorax AI Algorithm AUC by PTX size	
PTX Size	AUC
Small + Large	96.07% (94.91%, 97.24%)
Small Only	93.89% (92.09%, 95.70%)
Large Only	98.88% (98.10%, 99.65%)

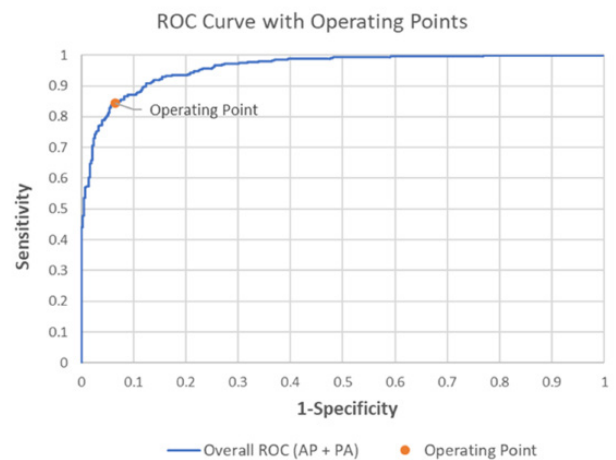
The following table describes algorithm performance for all PTXs, only small PTXs and only large PTXs.

Small and Large PTXs	Small PTX	Large PTX
Sensitivity (95% Confidence Interval)		
84.3% (80.63%, 87.98%)	93.5% (91.12%, 95.80%)	75.0% (69.17%, 80.83%)
		96.3% (93.31%, 99.19%)

Pneumothorax AI Performance by Pneumothorax Size

Critical Care Suite detects nearly all large PTXs (96%) and 3 out of 4 small PTXs (75%), with limited false alerts (95% specificity)⁵.

The ROC Curve below plots the operating point value.



Pneumothorax AI ROC Curve for Overall (AP+PA)

⁴The technologist on-device notification is generated after a delay, post exam closure, and it does not provide any diagnostic information, nor is it intended to inform any clinical decision, prioritization, or action.
⁵Based on retrospective clinical evaluation of 804 chest x-rays from two North American hospitals.



About GE Healthcare

GE Healthcare provides transformational medical technologies and services to meet the demand for increased access, enhanced quality and more affordable healthcare around the world. GE (NYSE: GE) works on things that matter - great people and technologies taking on tough challenges. From medical imaging, software & IT, patient monitoring and diagnostics to drug discovery, biopharmaceutical manufacturing technologies and performance improvement solutions, GE Healthcare helps medical professionals deliver great healthcare to their patients.

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