annalise

Annalise Enterprise

User Guide

English

Annalise Enterprise

OPT-PRM-027 v6

This guide is applicable to:

Component	Release
Annalise Enterprise	3.7 which includes: • Annalise Viewer version 3.5 • Annalise Backend version 3.7 • Annalise Integration Adapter version 3.7

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CE 2797

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Product overview

Product use

Intended purpose

Annalise Enterprise is a medical device intended to assist clinicians with the interpretation of radiological imaging studies and provide notification of suspected findings.

Indications for use

Annalise Enterprise identifies suspected findings in:

- digitised (CR) or digital (DX) chest X-ray studies taken in the anterior-posterior (AP) or posterior-anterior (PA) and optionally lateral (LAT) orientations of adult patients
- non-contrast brain CT scans (brain kernel) of adult patients

For chest X-ray (CXR), the device improves the detection of radiological findings visible on chest X-rays. For CT Brain (CTB), the device improves the detection of radiological findings visible on non-contrast CT brain scans.

The device identifies 124 CXR findings and 130 CTB findings (as defined in the *Findings list* on page 59).

The device is used on a PC workstation in conjunction with a medical imaging viewer (i.e. PACS).

The device may also be configured to provide input to worklist software to assist with notification and triaging. The device identifies studies with selected findings and communicates these studies to the worklist software which enables triaging of the worklist and notification.

Intended user

The device is intended to be used by trained clinicians who are qualified to interpret chest X-rays and/or brain CT scans as part of their scope of practice.

Intended patient population

The intended population is:

- CXR: Patients who are 16 years or older
- CTB: Patients who are 18 years or older

Contraindications

The device:

- is not intended to provide direct diagnosis
- is not to be used on patients under the age of 16 years for CXR and under the age of 18 years for CTB
- does not enable an increase in the clinician's scope of practice

WARNING

Qualified clinicians who interpret chest X-rays and/or brain CT scans as part of their scope of practice hold ultimate responsibility for interpreting studies.

The clinician must review the Annalise Enterprise output concurrently with the original chest X-ray images or brain CT scans and all other relevant clinical information before making a clinical decision.

Annalise product compatibility

Annalise Enterprise Backend Services compatibility is as follows:

Release	Component	Version
v3.7	Annalise Viewer	3.5, 3.4, 3.2, 3.1
	Annalise Integration Adapter	3.7, 3.6, 3.4, 3.3, 3.2, 3.1

Installation and system requirements

Refer to the *Annalise Enterprise Administration Guide* for details about system requirements and installation.

About Annalise Enterprise

Product description

Annalise Enterprise is a clinical decision support application which uses artificial intelligence (AI) algorithms to assist clinicians with the interpretation of radiological imaging studies. It is compatible with image and order management systems such as picture archiving and communication systems (PACS) and radiological information systems (RIS).

The suspected findings are communicated to the clinician viewing the study by displaying the findings and associated localisation information to the clinician as they view the study in the PACS viewer.

Additionally, the device may be configured to provide input to worklist software to assist with notification and triaging. The device identifies studies with selected findings (as defined by the customer) and communicates these studies to the worklist software which enables triaging of the worklist and notification.

The output of Annalise Enterprise may be used in other products and/or modules to provide information to the intended users as specified in the Annalise Enterprise findings list.

Annalise Enterprise contains the following:

- Annalise Viewer
- Annalise Secondary Capture
- Worklist Triage

Note: Annalise Secondary Capture is an additional product option.

Annalise Viewer

The Annalise Viewer displays the AI results of adult chest X-ray studies and non-contrast CT brain studies (including findings and localisation information).

Annalise Secondary Capture

The Annalise Secondary Capture DICOM series is inserted into your PACS. When opened, the series displays the AI results of adult chest X-ray studies (including findings and localisation information).

Annalise Secondary Capture is available for CXR only.

Worklist Triage

Annalise Enterprise uses an AI algorithm to provide notification of selected findings for worklist prioritisation and triage.

Configuration options

Each organisation can specify the findings that will result in triage and the priority of each finding. The exact functionality available depends on the worklist software used.

Depending on the columns available in your worklist you can receive and display a study's AI priority in the worklist in either:

- a single 'Priority' column

  Annalise Enterprise will only triage findings with the highest rank. This ensures that it will never decrease a study's existing priority in the worklist.

- a dedicated 'AI priority' column

  Annalise Enterprise can triage findings with all ranks in the dedicated AI priority column. This ensures that any existing priorities are not changed.

Note: Contact the Annalise.ai Professional Services Team for assistance with your preferred configuration.

Artificial intelligence (AI) algorithms

The Artificial Intelligence (AI) algorithms used in the device are convolutional neural networks trained on over 750,000 CXR and 200,000 CTB imaging studies.

These algorithms use deep-learning techniques to:

- identify suspected radiological findings
- highlight the relevant areas of interest (display localisation) for a subset of findings, and
- identify laterality.

The images used to train these algorithms were sourced from datasets with a range of patient demographics and technical characteristics, including different X-ray and CT manufacturers and machines.

Supported scan types

Annalise Enterprise supports the following scan types:

CXR	CTB
• minimum one frontal (AP/PA) • up to three images in total Note: If a study contains more than three CXR images, the AI model will select a combination of the best three frontal/lateral images.	• axial (coronal and sagittal views are generated by the axial view) • slice thickness up to and including 1.5mm • non-contrast brain CT scans • brain reconstruction kernel • up to 1,000 images

Operating points

Operating points for each finding are defined by your organisation during deployment (with assistance from Annalise.ai).

If you need to adjust an operating point for your organisation, contact your internal IT support team who can then request adjustments from Annalise.ai.

Security features

Annalise Enterprise includes security features which protect against unauthorised access and data modification.

These features ensure the secure authentication and encryption of sensitive data when transmitted between:

- the Annalise Integration Adapter and the Annalise Backend
- the Annalise Viewer and the Annalise Backend
- the PACS Image Viewer and the Annalise Viewer (available when using the HTTPS interface)

It also includes the encryption of sensitive data stored in the Annalise Backend.

Annalise Viewer

Annalise Viewer functions

Overview

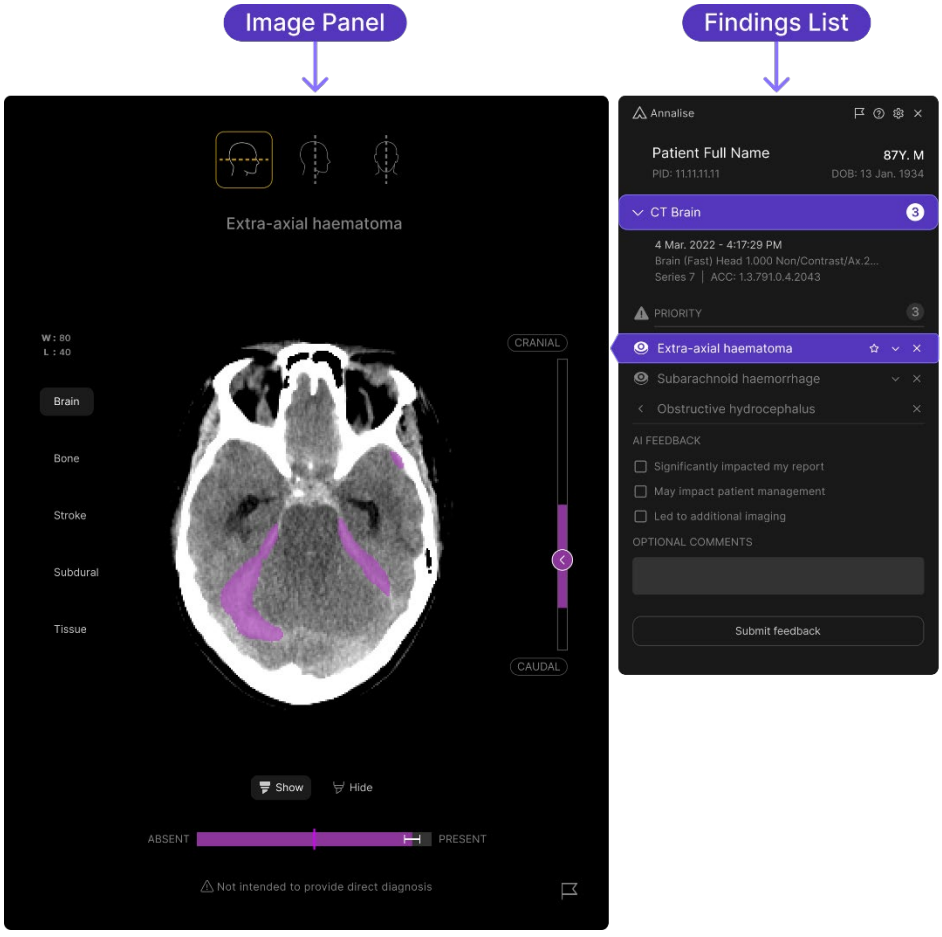
The following section outlines the functions available on the Annalise Viewer for both CXR and CTB studies.

If your organisation has enabled the feedback function, extra functions will display when you are in 'feedback mode'.

See *Feedback mode* on page 16.

Main components

The Annalise Viewer includes the Image Panel and the Findings List.



For further details see:

- *Image Panel: CTB* on page 13
- *Image Panel: CXR* on page 14
- *Findings List* on page 15
- *Study Details Panel (CXR only)* on page 15

Image Panel: CTB

Components and functions of the Image Panel (for CTB studies) are shown below.

Depending on the study's findings, the study may display localisation or laterality. The study in this example includes localisation.

See *Image Panel functions* on page 18.

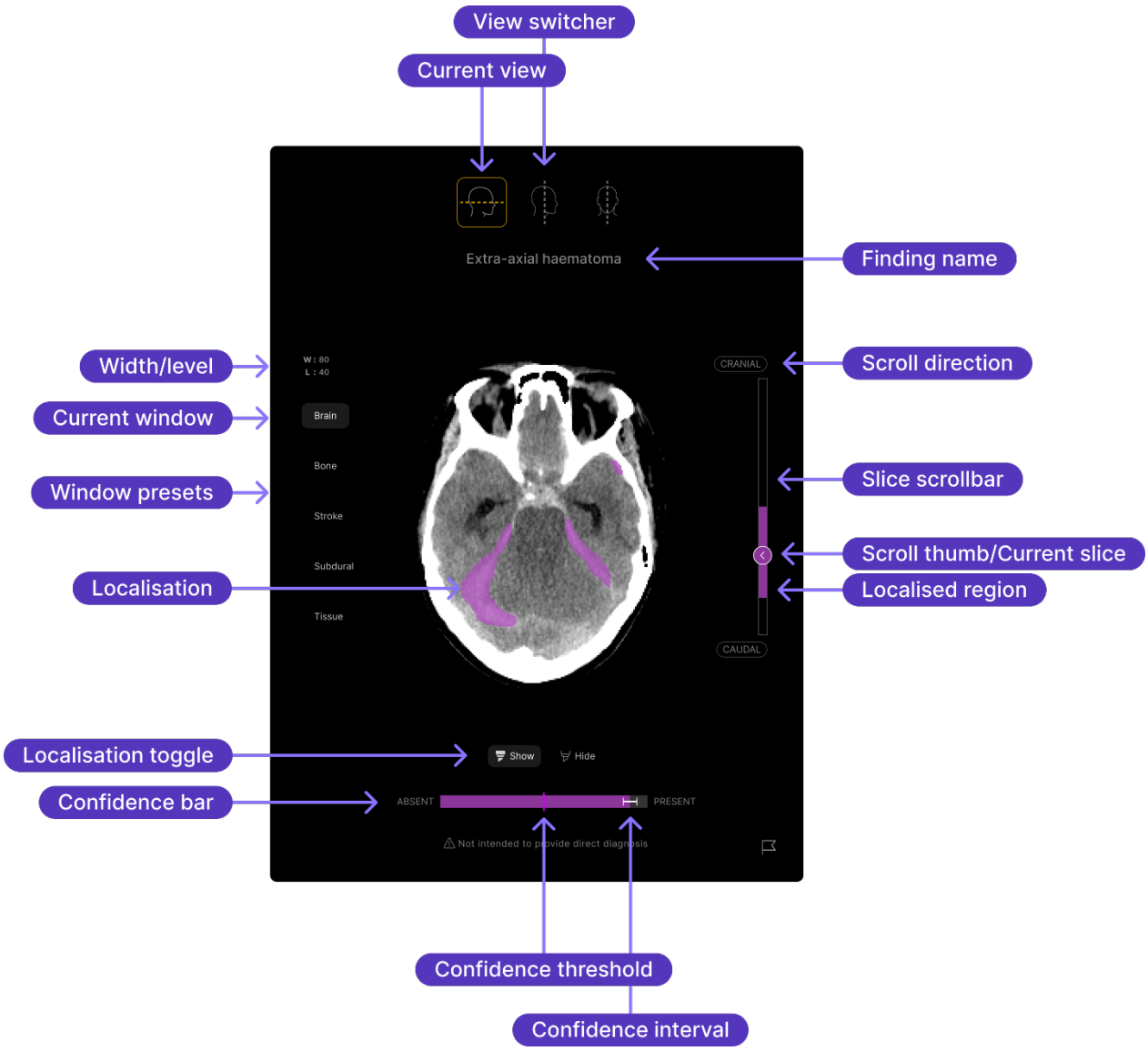
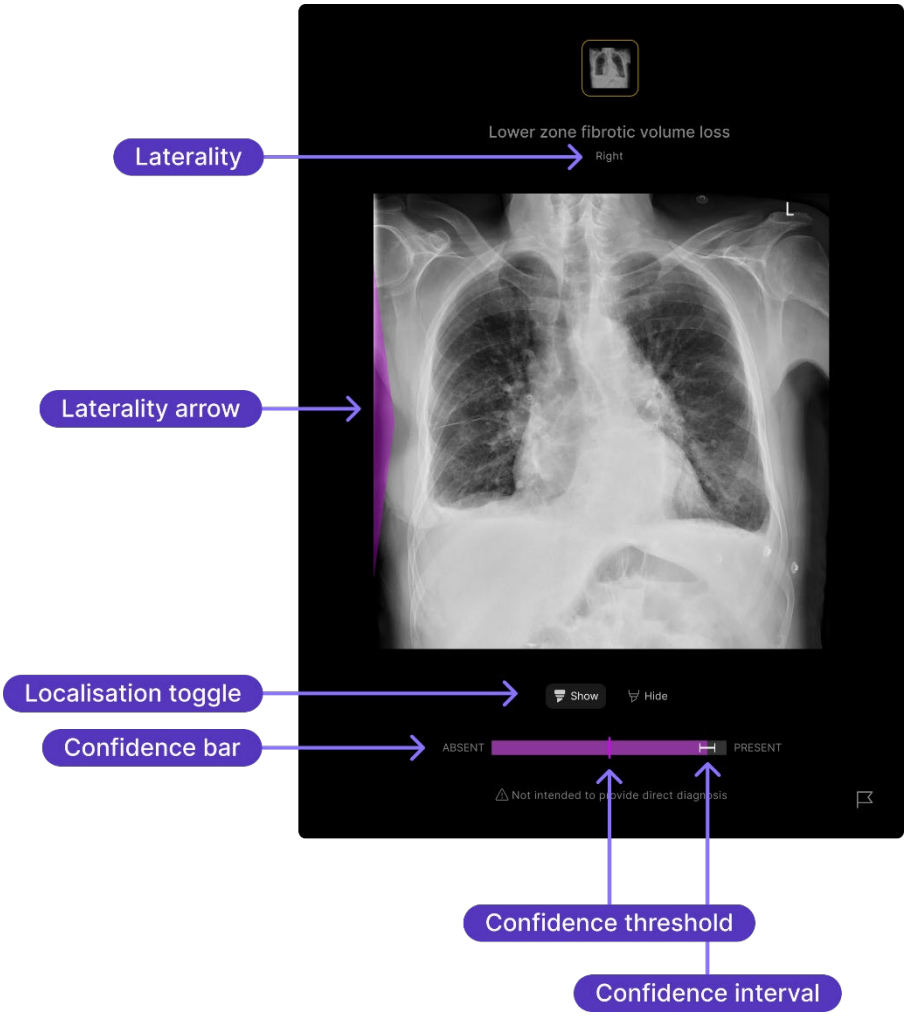


Image Panel: CXR

Components and functions of the Image Panel (for CXR studies) are shown below.

Depending on the study's findings, the study may display localisation or laterality. The study in this example includes laterality.

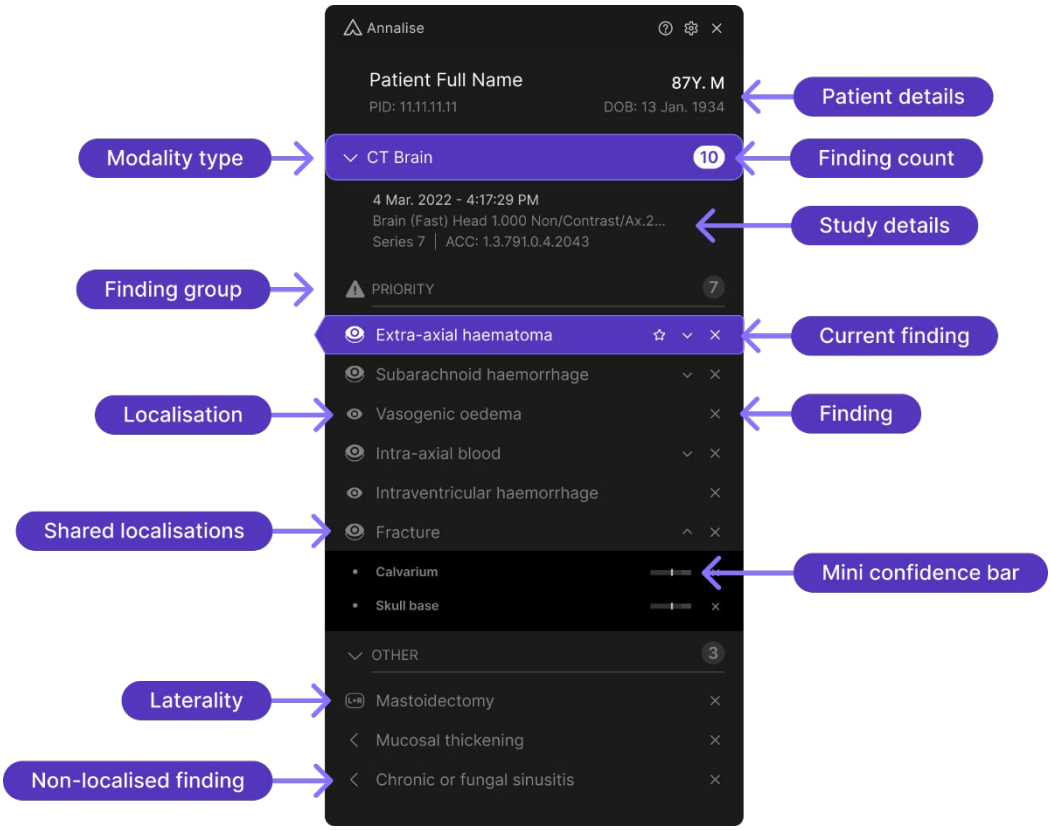
See *Image Panel functions* on page 18.



Findings List

Components and functions of the Findings List are shown below.

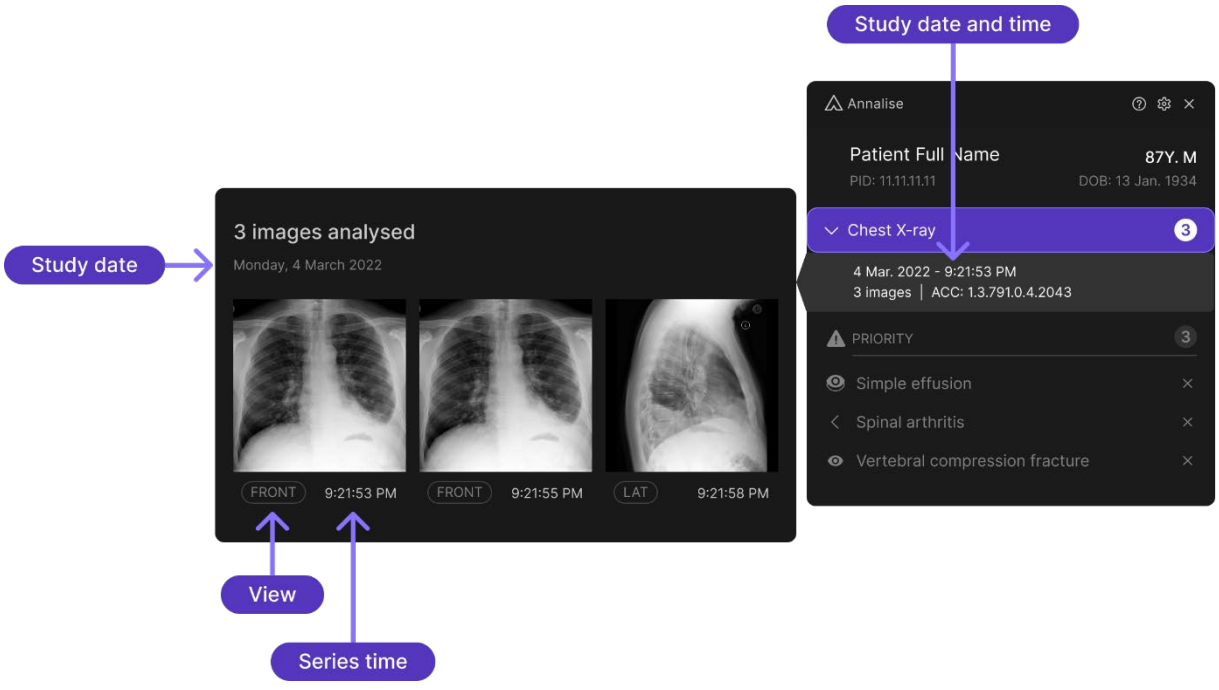
See *Findings List functions* on page 20.



Study Details Panel (CXR only)

Components and functions of the Study Details Panel are shown below.

See *Study Details Panel functions (CXR only)* on page 22.

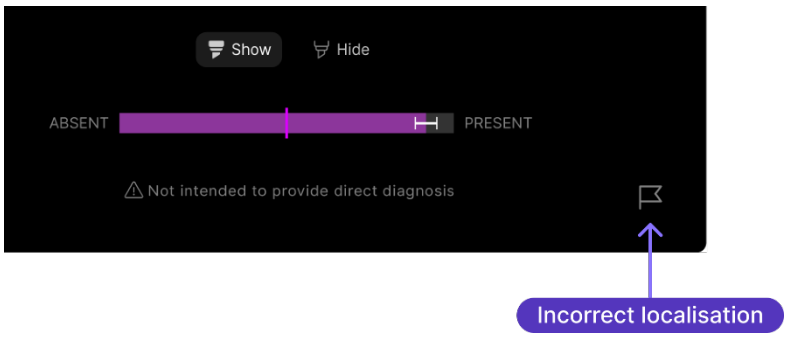


Feedback mode

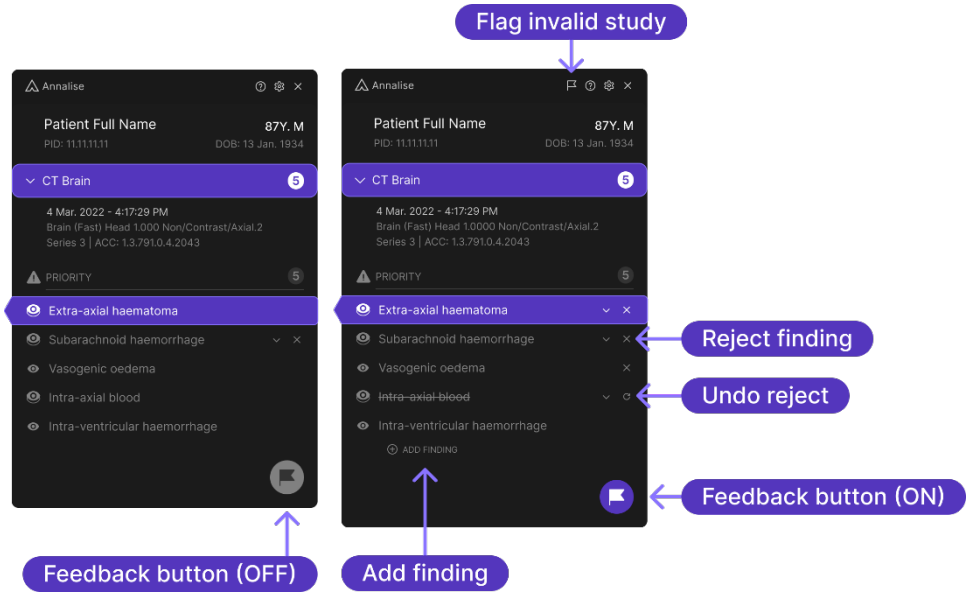
If the feedback function has been enabled by your organisation, some or all of the following options will display, depending on the type of feedback enabled.

See *Feedback mode functions* on page 23.

Feedback mode: Image Panel



Feedback mode: Findings List (AI model feedback)



Feedback mode: Findings List (Trial feedback)

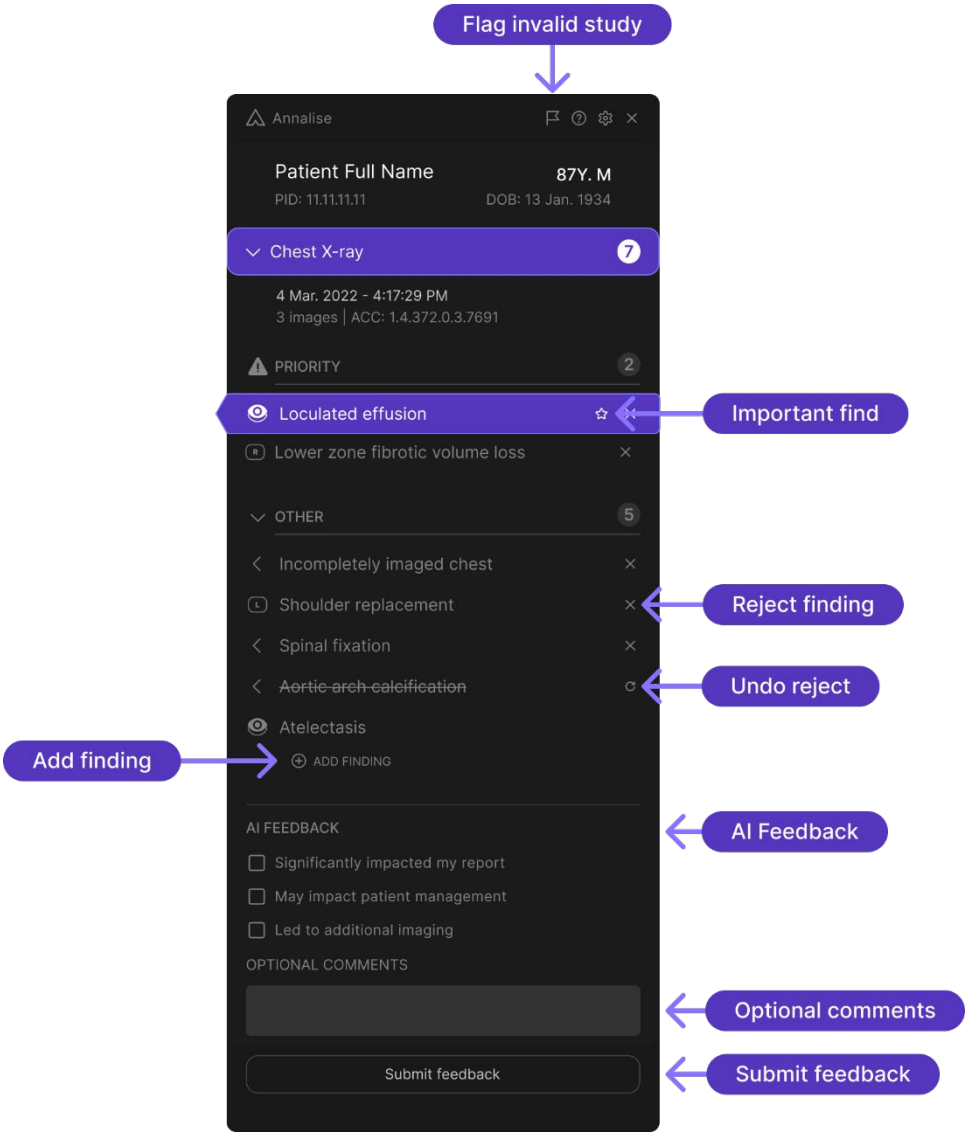


Image Panel functions

The Image Panel is located on the left of the Findings List.

It displays the current image associated with the selected finding, including any localisation or laterality related to the finding (and its confidence level). It also enables you to access different views of the study.

The following functions display on the Image Panel:

Function	Details
View switcher	The **View switcher** icons enable you to switch between image views. The following views are available for CXR studies: • Frontal • Lateral (may not be present if not processed) The following views are available for CTB studies: • Axial • Sagittal • Coronal The active view is highlighted.
Finding name	The **Finding name** displays the name of the finding selected in the Findings List.
Width/level *(CTB only)*	The **Width/level** indicates the predetermined width and level of the selected greyscale spectrum: • **W** – indicates window width • **L** – indicates window level
Window presets *(CTB only)*	**Window presets** enable you to view the following pre-configured options (for CTB studies): • **Brain** • **Bone** • **Stroke** • **Subdural** • **Tissue** When you select an option, the associated width/level values display (see *Width/level*). The active window is highlighted.
Slice scrollbar *(CTB only)*	The **Slice scrollbar** enables you to scroll though all available slices for the current CTB study (see *Scroll thumb/Current slice* on page 19). If localisation is associated with the finding, the purple areas in the scrollbar indicate the areas of localisation in the study.

continued

Function	Details
Scroll thumb/Current slice (*CTB only)*	The **Scroll thumb/Current slice** enables you to scroll through the images. It also indicates the current slice position in the **Slice scrollbar**.
Scroll direction *(CTB only)*	The **Scroll direction** displays at both ends of the **Slice scrollbar**. These indicators show the direction you are moving in as you scroll through the images.
Localisation	If localisation is associated with the finding, it will display as a purple overlay over the relevant area in the image.
Laterality	If localisation cannot be localised to a specific area, a purple **Laterality arrow** will indicate laterality on the left, right (or bilateral) sides of the image.
Localisation toggle	The **Localisation toggle** enables you to show or hide localisation for the current study. Note: If you switch this option off, it will automatically switch on again as soon as you hover over either a **Localisation** or **Laterality** icon.
Confidence bar	The **Confidence bar** provides a visual indication of the likelihood that a particular finding is present. It enables you to see the relationship between the **Confidence threshold** and the 95% **Confidence interval**.
Confidence threshold	The **Confidence threshold** is the score below which the AI model is no longer confident that a finding is present.
Confidence Interval	The 95% **Confidence Interval** is a fixed number that's added to or subtracted from the calculated confidence score. It indicates the probability of the AI model reporting a false positive (i.e. not actually present in the image).

Findings List functions

The Findings List is located on the right of the Image Panel.

It displays details about the patient and the modality as well as information about the current study and its associated findings.

By default, the findings display in order of clinical severity (as determined by Annalise.ai expert radiologists), but you can configure this order to meet your requirements.

The Findings List enables you to access:

- the **Help** and **Settings** functions, and
- other analysed images (for CXR studies).

See *Study Details Panel (CXR only)* on page 15.

The following functions display on the Findings List:

Function	Details
Patient details	The following patient details display for the current study: • Name • Age • Gender • Patient ID • Date of birth (**DOB**) Note: You can choose how you would like the patient's name to display (see *Set user preferences* on page 30). Your organisation may have also configured the patient ID label and/or date format used in the Annalise Viewer. If so, the details you see may not match the images in this guide.
Modality type	The **Modality type** indicates the current modality (i.e. 'Chest X-ray' or 'CT Brain'). It also displays the total number of findings for the current study.
Study details	The **Study details** display the following: • study date* and time *The date and time the X-ray/CT machine recorded the study.* • study description: - CTB: The series number within the current study and the series description - CXR: The number of other analysed images for the study *If the description is more than 64 characters, an ellipsis ('...') will display at the end, indicating that there is further information in this field. If this occurs, hover your mouse over the ellipsis to see the full description.* • accession number *A unique number used to identify a diagnostic report. All images within a study will have the same accession number.* *Note: Your organisation may have configured the date format used in the Annalise Viewer. If so, the details you see may not match the images in this guide.

continued

Function	Details
Findings	The suspected radiological findings detected by the AI model. If you hover over a finding in the Findings List: • it will be highlighted purple in the Findings List, and • this finding will display on the Image Panel. If the model detects that no findings are present, the Annalise Viewer will not contain any results (and the '*No AI findings detected'* message will display).
Finding count	The **Finding count** that displays beside each finding group indicates the number of findings in that group.
Finding groups	**Finding groups** are located on the Findings List. All findings are grouped according to status or type. Each finding has both a pre-defined display order and a group to which it belongs. The following default groups* display: • Priority *Findings in this group always display.* • Other • User added *This group displays if a user adds any additional findings.* • Technical *This group displays if one or more findings are classified as 'technical' (i.e. non-anatomical artefacts which occurred during the X-ray or scan).* *Your organisation can request to configure the following: • group names • displaying certain findings only • adding another group, and/or • determining the findings that display within each group. Note: As the first group will always contain findings that are more clinically relevant (regardless of whether it is called 'Priority' or has another name), it cannot be collapsed.
Localisation	The **Localisation** icon displays when localisation is associated with the finding. See *Localisation* on page 19.
Shared localisations *(CTB only)*	The **Shared localisation** icon displays when more than one finding shares the same localisation. These findings are grouped together to make it easier for the radiologist to interpret the study. Each group includes a shared localisation 'title' and the associated findings displayed underneath (each with their own confidence levels – see *Mini confidence bar* on page 22). When you click this title, the shared localisation displays on the Image Panel. By default, each shared localisation group will be collapsed. Click the down arrow next to the title to display the associated findings or click the up arrow to collapse them.

continued

Function	Details
Mini confidence bar *(CTB only)*	The **Mini confidence bar** indicates the confidence level for a finding. It displays next to the findings that are associated with a shared localisation only.
Laterality	The **Laterality** icon displays if the finding is localised to left or right. The icon indicates the side (or sides) of the body to which the finding relates: • **L** – Left • **R** – Right • **L + R** – Bilateral See *Laterality* on page 19.
Feedback button	The **Feedback** button enables you to enter feedback mode and provide feedback about the AI model's performance. Note: This button only displays if the feedback function has been enabled for your organisation.

Study Details Panel functions (CXR only)

The Study Details Panel displays for CXR studies only. It enables you to view up to three of the images that were analysed to produce the AI findings.

Click the **Study details** area in the Findings List to display the Study Details Panel (see *Findings List* on page 15).

Function	Details
Study date	Displays the date that the X-ray machine recorded the images. Note: Your organisation may have configured the date format used in the Annalise Viewer. If so, the details you see may not match the images in this guide.
View	Indicates the view from which the image was taken.
Series time	Displays the time that the X-ray machine recorded the image.

Feedback mode functions

The following extra functions display on the Findings List and Image Panel while you are using the Annalise Viewer in 'feedback mode' (see *Provide feedback* on page 36).

Note: The feedback feature is not to be used for reporting product complaints. If you have a product complaint or urgent product feedback, see *Support and feedback* on page 57.

Note: Feedback mode is only available if it has been enabled by your organisation.

Function	Details
Flag invalid study	The **Flag invalid study** button enables you to indicate that the study is either: • not a CXR (for CXR studies), or • not an eligible series (for CTB studies).
Add finding	The **Add finding** button enables you to add a finding that is missing from the study (i.e. was not identified by the AI model).
Reject finding	The **Reject** button enables you to reject a finding.
Undo reject	The **Undo reject** button enables you to reinstate a previously rejected finding in the Findings List.
Important find	The **Important find** ('star') button displays when you hover your mouse over a finding. It enables you to flag an important finding that the AI model has identified. Note: This option is only available if your organisation has enabled the 'trial' feedback function.
AI feedback	The **AI feedback** questions enable you to provide specific feedback about the Annalise Viewer. Note: This option is only available if your organisation has enabled the 'trial' feedback function. These questions can be customised for your organisation.
Optional comments	The **Optional comments** field enables you to provide additional feedback comments about the Annalise Viewer. Note: This option is only available if your organisation has enabled the 'trial' feedback function.
Submit feedback	The **Submit feedback** button enables you to save and submit any feedback you have added. Note: This option is only available if your organisation has enabled the 'trial' feedback function.
Incorrect localisation	The **Incorrect localisation** button enables you to indicate that you believe localisation of the current finding is incorrect.

Getting started: Annalise Viewer

Overview

This section shows you how to:

- run the Annalise Viewer Adapter (if required)
- launch the Annalise Viewer
- access Annalise Enterprise (via either single sign-on or legacy access)
- access initial functions, and
- set your user preferences.

Run Annalise Viewer Adapter

Depending on the type of PACS that you are using, you may need to run the Annalise Viewer Adapter to access the Annalise Viewer.

If you are using a Sectra IDS7 PACS, contact your system administrator to see whether the *Annalise Viewer Adapter for Sectra IDS7* has been installed on your computer.

For full details about installation and system requirements, refer to the *Annalise Viewer Adapter for Sectra IDS7 Administration Guide*.

Launch Annalise Viewer

You can choose whether you want the Annalise Viewer to display automatically when you view a study in the PACS/RIS or you can open it manually.

Note: Your options may depend on the integration capabilities of your PACS/RIS.

Once open, the Annalise Viewer displays the AI results for the current study.

1. Open the PACS/RIS worklist.

   If the Annalise Viewer doesn't automatically display, you can either:

   - open it manually, or
   - update your user settings so that it displays automatically (if available).

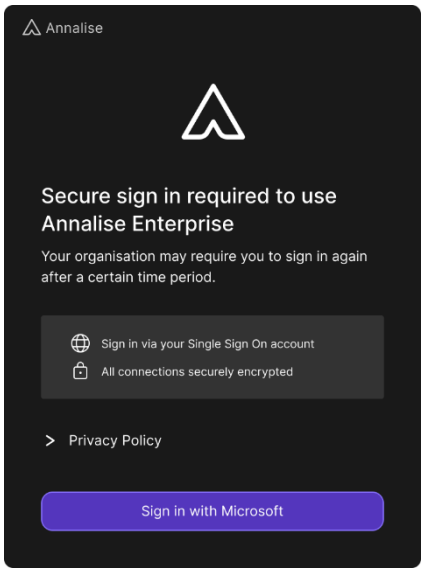
Open Annalise Viewer **manually**	Either: • open the Annalise Viewer via the **Start** menu on your computer, or • click the  button on the PACS/RIS viewer menu bar.
Update settings to open Annalise Viewer **automatically**	See *Automatically show findings* on page 31.

Access Annalise Enterprise (using single sign-on)

Single sign-on enables you to sign into both Annalise Enterprise and your Microsoft work account using a single set of credentials.

If your organisation has enabled single sign-on, you will need to enter your username and password via your internet browser through Microsoft.

Note: If you want to view the Annalise.ai *Privacy Policy* before you log in, click **Privacy Policy** (then navigate back to the *Secure sign in* window once you have finished).



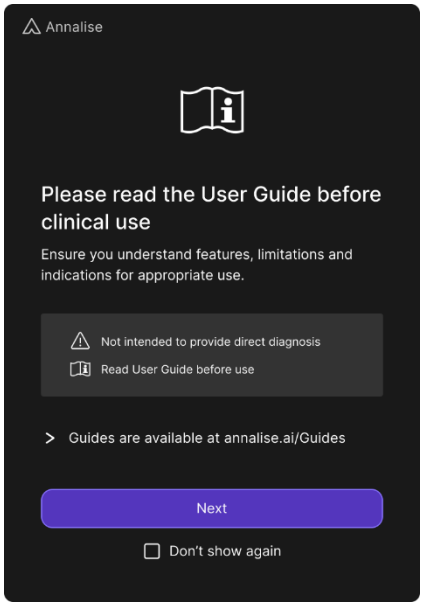
1. Click **Sign in with Microsoft**.
2. On the sign-in screen that displays, type your username and password (as provided by your organisation).

   Once you have successfully signed in:

If this is the **first** time you have signed into Annalise Enterprise	• a window will display, prompting you to read the *User Guide* • go to *Read User Guide* on page 26
If you have signed in **previously** and chosen to hide the *User Guide* prompt	• the Annalise Viewer will automatically display the AI results for the current study

Read User Guide

Ensure that you read the *User Guide* so that you understand the features and limitations of the device as well as the indications for appropriate use.



1. Click the option to open the Annalise.ai guides, then read the *User Guide*.
2. If you don't want this window to display again, click to select the **Don't show again** checkbox.

   Note: If you select this checkbox, the next time you access Annalise Enterprise the Annalise Viewer will automatically display the AI results for the current study.

   You can still access the *User Guide* via the **Help** button at the top of the Annalise Viewer (see *Access initial functions* on page 28).
3. When you have finished, click **Next**.

   The Annalise Viewer will display the AI results for the current study.

Access Annalise Enterprise (using legacy access)

If your organisation has not enabled single sign-on, the following will occur when you first access Annalise Enterprise:

- a window will display prompting you to read the *User Guide*
- a message will prompt you to add your server settings (refer to the *Annalise Enterprise Administration Guide* for details)

Read User Guide

Ensure that you read the *User Guide* so that you understand the features and limitations of the device as well as the indications for appropriate use.

1. Click the option to open the Annalise.ai guides, then read the *User Guide*.
2. If you don't want this window to display again, click to select the **Don't show again** checkbox.

   Note: If you select this checkbox, the next time you access Annalise Enterprise the Annalise Viewer will automatically display the AI results for the current study.

   You can still access the *User Guide* via the **Help** button at the top of the Annalise Viewer (see *Access initial functions* on page 28).
3. When you have finished, click **Next**.

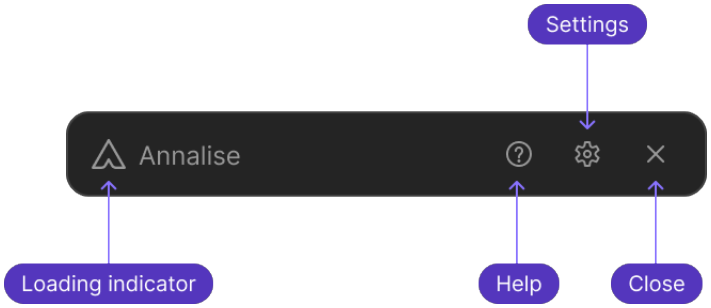
   The Annalise Viewer will display the AI results for the current study.

Access initial functions

Once open, the Annalise Viewer will display the AI results for the current study.

Study loading

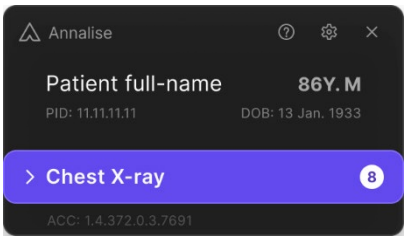
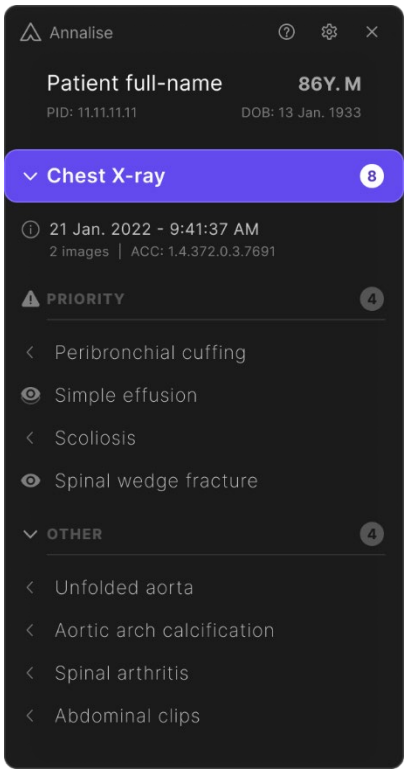
The following will display (and the loading indicator will spin) while the study is loading:



Study loaded

Once the study has loaded, the Findings List on the Annalise Viewer will either be collapsed or expanded, depending on the **Settings** options you choose.

See *Automatically show findings* on page 31.

Findings list **collapsed**	Findings list **expanded**
	

Initial functions

Action	Details
Loading indicator	When you first launch the Annalise Viewer, the **Loading indicator** will spin to indicate that the study is loading.
Access **Help**	Click the **Help** button to: • view the Annalise Viewer version and UDI • access the related *User Guide*, *Performance Specifications*, *Legal Notices* and *Privacy Policy* Click the **Close** button to return to the Annalise Viewer.
Set user preferences	Click the **Settings** button to update your user preferences (see *Set user preferences* on page 30). Note: If you are using legacy access and need to update your server settings, contact the Annalise.ai Professional Services Team for assistance. Click the **Close** button to return to the Annalise Viewer.
Close viewer	Click the **Close** button to minimise the Annalise Viewer so that it displays on your task bar. The viewer will automatically re-open when there are new AI findings to display.
Move viewer	To move the Annalise Viewer to another location or screen, click the viewer then drag it to the required position.
Close application	To close the application, right click the Annalise icon on your task bar then select **Quit**.

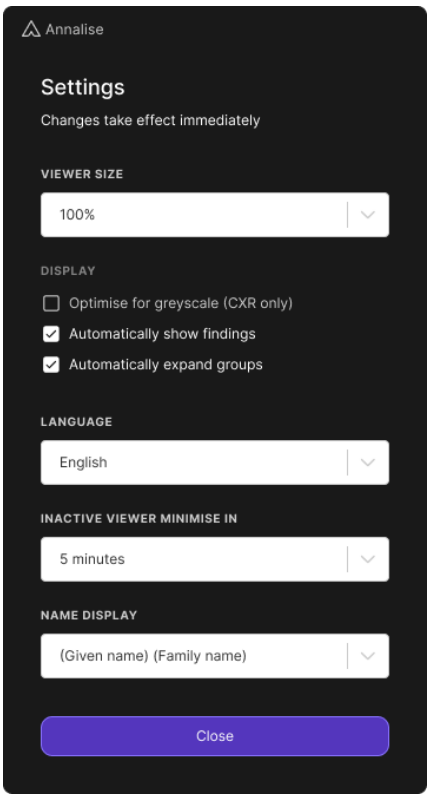
Set user preferences

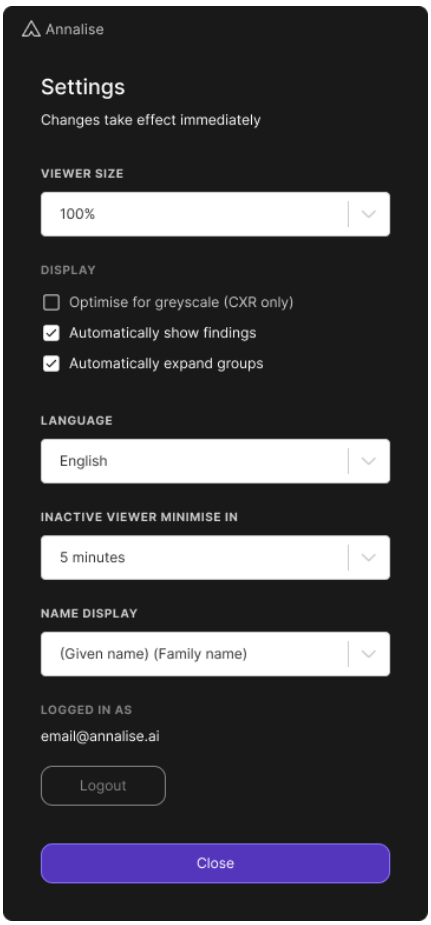
Follow these steps to access the *Settings* screen to select your user preferences.

1. Click the **Settings** button at the top right of the Annalise Viewer.

   The *Settings* screen displays.

If using legacy access	If using single sign-on





continued

2. Select your user preferences.

   If you are using single sign-on, you can also:
   - view the email of the user who is currently logged in, and
   - click **Logout** to log out of Annalise Enterprise.

Option	Details
Viewer size	Click to select the size that you want the viewer to display on your screen.
Optimised for greyscale *(CXR only)*	This option enables you to optimise the greyscale image: • if you select this option (for example, if your CXR radiography monitor is greyscale only), the user interface will remove reliance on colours to display findings • if you don't select this option, the user interface will use colour to highlight findings
Automatically show findings	This option enables you to automatically show findings when you are viewing a study: • if you select this option, the Findings List will automatically display the findings • if you don't select this option (or if the automatic option is not available), you will need to manually expand the Findings List: - open the Annalise Viewer (see *Open Annalise Viewer manually* on page 24) - click the **Modality type** on the Findings List (see *Modality type* on page 20)
Automatically expand groups	This option enables you to automatically expand all finding groups when the Findings List displays: • if you select this option, all groups will be expanded • if you don't select this option, only the 'Priority' findings group (or your organisation's equivalent) will be expanded See *Finding groups* on page 21.
Language	Select the relevant language to display.
Inactive viewer minimise in	Select the inactive time period after which the viewer will be automatically minimised.
Name display	You can choose how you would like the patient name to display. Options include: • (Given name) (Family name) • (Family name) (Given name) • (Family name), (Given name)

3. When you have finished, click **Close** to return to the Annalise Viewer.

Using the Annalise Viewer

Review AI findings

The Annalise Viewer displays the suspected radiological findings for a study in the Findings List (the results that display depend on the configuration set by your organisation).

This section shows you how to:

- verify the patient's details
- review the findings
- interpret the confidence level of each finding

Verify patient details

1. Launch the Annalise Viewer.

   See *Launch Annalise Viewer* on page 24.

2. To verify the patient's details, check that the Patient ID and Accession No. (**ACC**) on the Findings List match those on the study loaded in the PACS viewer.

   Note: Your organisation may have configured the patient ID label used in the Annalise Viewer. If so, the details you see may not match the images in this guide.

continued

Review the findings

Multiple findings with varying degrees of confidence may display. In these instances, it is important to use your clinical judgement when reviewing all findings.

1. Use the following functions to help you review the findings:

Function	Details
Show images analysed for the current study	Select a finding in the Findings List to display it in the Image Panel. • For CXR studies, you can view both: - the current image in the Image Panel, and - up to three other images that have been analysed for the current study (click the **Study details** on the Findings List to display these images) See *Study Details Panel (CXR only)* on page 15. • For CTB studies, all of the images display in the Image Panel. Click and drag the **Scroll thumb** (or use your mouse wheel) to scroll through these images. See: - *Scroll thumb/Current slice* on page 19 - *Slice scrollbar* on page 18
Switch between views	On some clinical findings, the regions of interest may be highlighted on multiple views. To switch between views, click the **View Switcher** to navigate to other available views (the highlighted icon indicates the active view). For CTB studies, you can also use the **Width/level** to view the relevant pre-configured window presets. See: • *View switcher* on page 18 • *Width/level* on page 18
Identify the number of findings present	A number displays in the following locations to indicate the number of findings identified by the AI model: • beside the **Modality type** (total number of findings), and • next to each findings group (total for that group). Click the down arrow beside any findings with shared localisations to view all associated findings (see *Shared localisations* on page 21).

continued

Function	Details
Review regions of interest (ROI)	If present, regions of interest (ROI) will be highlighted on the image displayed in the Image Panel. Note: The **Localisation toggle** must be switched on to view localisation or laterality (see *Localisation toggle* on page 19).
View localisation	If localisation is associated with a finding, a **Localisation** icon will display next to the finding name in the Findings List and a purple overlay will display on the image when you select the finding. For CTB studies, you can also use the scroll thumb to scroll through the areas highlighted in purple on the **Slice scrollbar**.
View laterality	If the finding is not localised to a specific area, a **Laterality** icon will display next to the finding name in the Findings List and a purple arrow (or arrows) will display on the image when you select the finding.
Localisation does not display	If the AI model indicates that a finding is present and its location is obvious to the clinician, localisation will not display for that finding (and the **Localisation** icon will not show in the Findings List). To check which findings display localisation, see the *Findings list* on page 59.
Switch localisation/ laterality option on or off	To switch the localisation/laterality option on or off, click the **Localisation toggle** at the bottom of the Image Panel. See *Localisation toggle* on page 19.

Interpret the confidence level

A default confidence threshold for each finding will be provided for your organisation. For a finding to be considered present in the study, it must therefore have a score greater than this threshold.

For each finding, the AI model provides:

- a prediction score, and
- a 95% confidence interval.

This information is displayed on the Confidence bar in the Image Panel.

See:

- *Confidence bar* on page 19
- *Confidence threshold* on page 19
- *Confidence Interval* on page 19

Refer to the following examples:

Confidence level	Interpretation
Higher confidence	• The prediction score is above the confidence threshold • The confidence interval is above the confidence threshold • The finding is most likely present in the study 
Lower confidence	• The prediction score is above the confidence threshold • The lower border of the confidence interval is below the confidence threshold • The finding may be present in the study 

Provide feedback

The feedback function enables you to provide feedback about the AI model's performance.

Depending on the feedback mode you are using, you can:

- flag an incorrect study
- flag an incorrect localisation
- add missing findings
- reject findings (and reinstate previously rejected findings)
- mark findings as an 'important find'

Note: The feedback feature is not to be used for reporting product complaints. If you have a product complaint or urgent product feedback, see *Support and feedback* on page 57.

The following types of feedback are available:

Feedback mode	Usage
Trial feedback	Usually enabled when you are using Annalise Enterprise as part of an evaluation during a trial period. 1. Refer to the table below for feedback options. 2. To save and submit your feedback, click **Submit feedback**.
AI model feedback	Your organisation can choose to switch this function on or off. 1. If the feedback options don't automatically display, go to the bottom right of the Findings List and click the **Feedback** ('flag') button (see *Feedback mode: Findings List (AI model feedback)* on page 16). 2. Refer to the table below for feedback options. 3. To save and submit your feedback, click the **Feedback** button again.

Feedback options

Option	Steps
Flag an incorrect study	If a study is invalid, click the **Flag invalid study** ('flag') button at the top of the Findings List. To undo this action, click the button again to remove the flag.
Flag an incorrect localisation	If you feel that the localisation of the current finding is incorrect, click the **Incorrect localisation** button at the bottom right of the Image Panel. A flag will display to the right of the finding on the Findings List. To undo this action, click the button on the Image Panel again to remove the flag.

continued

Option	Steps
Add a missing finding	If a finding is missing from the study: 1. Click **Add Finding** at the bottom of the Findings List 2. Type the name of the finding in the **Enter Finding** field - if the finding displays, click to select the finding - if the finding doesn't display, type the full name of the finding, then click **Add New** The new finding will display under the *User added* finding group. See *Finding groups* on page 21.
Reject an incorrect finding	If you determine that an AI finding that displays in the Findings List is not present in the study, click the **Reject** button beside the finding name. The finding name will display as strikethrough text.
Undo a rejected finding	If you have rejected a finding but want to undo this action (and reinstate the finding in the Findings List), click the **Undo Reject** button beside the finding name.
Mark a finding as an 'important find'	If you determine that the AI model has identified an important finding that may otherwise have been missed, hover your mouse over the relevant finding and click the **Important find** ('star') button. Note: This option can only be used during trial feedback.
Feedback questions	Click to select any question/s if they apply. Note: This option can only be used during trial feedback. The questions can be customised for your organisation.
Provide extra comments	Type any extra comments in the **Optional comments** field. Note: This option can only be used during trial feedback.

Annalise Secondary Capture

Annalise Secondary Capture functions

Overview

The following section outlines the functions available on Annalise Secondary Capture.

Main components

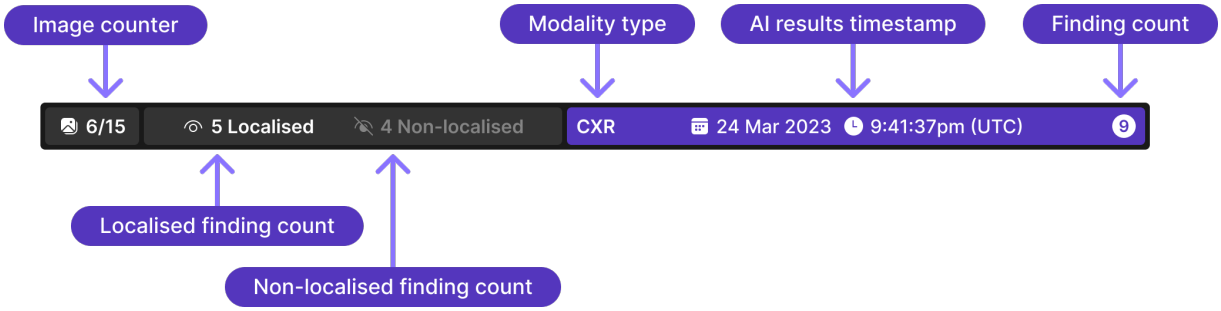
Annalise Secondary Capture includes the following:

- Info bar
- Summary Panel
- Finding Panel

Info bar

The Info bar displays at the top of all screens and includes information about the current study.

See *Info bar components* on page 44.



Summary Panel

The Summary Panel is the first panel that displays when you view Annalise Secondary Capture.

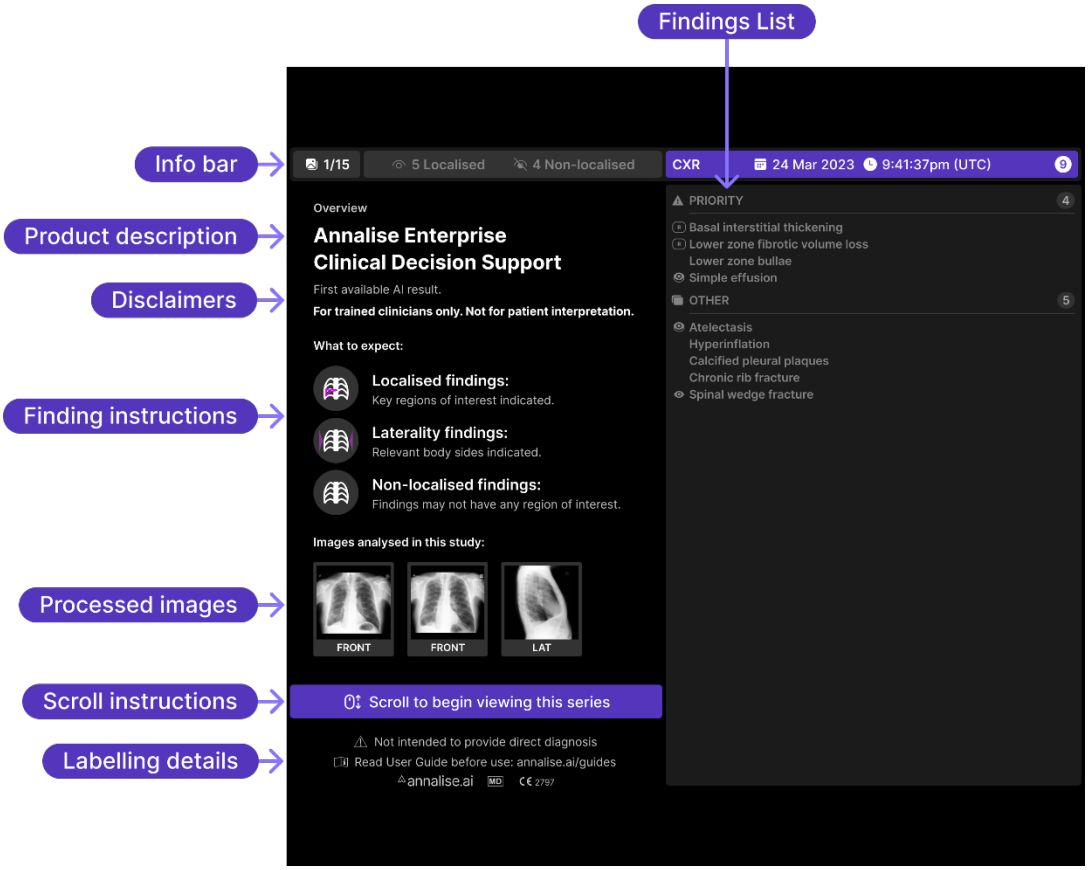
It includes instructions about using Annalise Secondary Capture and displays the images that were analysed for the current study.

It also displays the findings that have been identified by the AI algorithm.

See *Summary Panel components* on page 44.

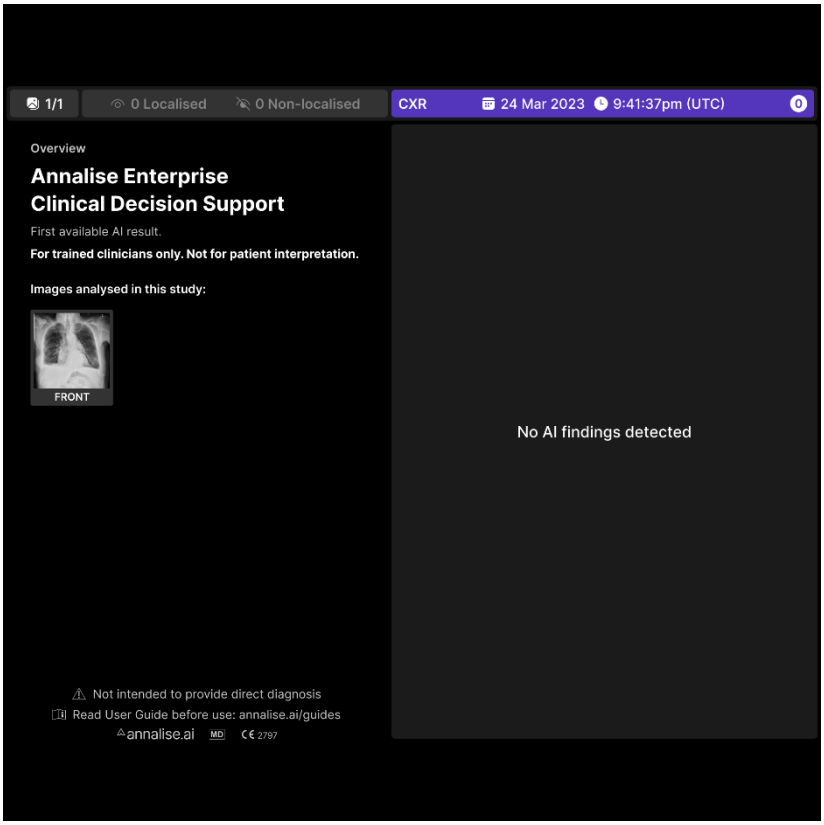
Findings detected

The following example shows a study in which findings have been detected.



No findings detected

The following example shows a study for which no findings have been detected.



Finding Panel

If findings are detected for a study, the Finding Panel will display as you scroll through the results.

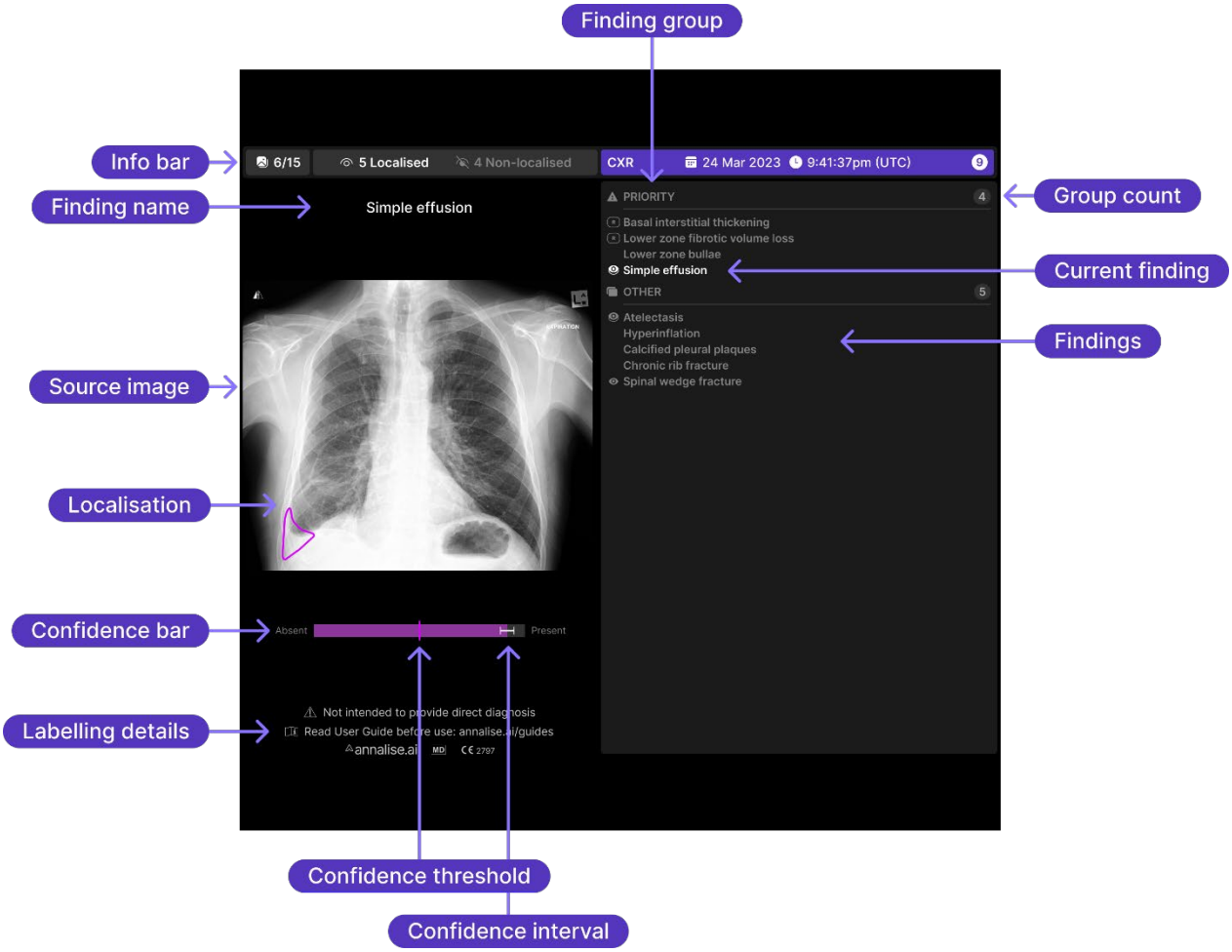
One or more CXR images will display per finding (depending on the number of images analysed by the AI algorithm).

By default, the findings display in order of clinical severity (as determined by Annalise.ai expert radiologists) but you can configure this order to meet your requirements.

See *Finding Panel components* on page 46.

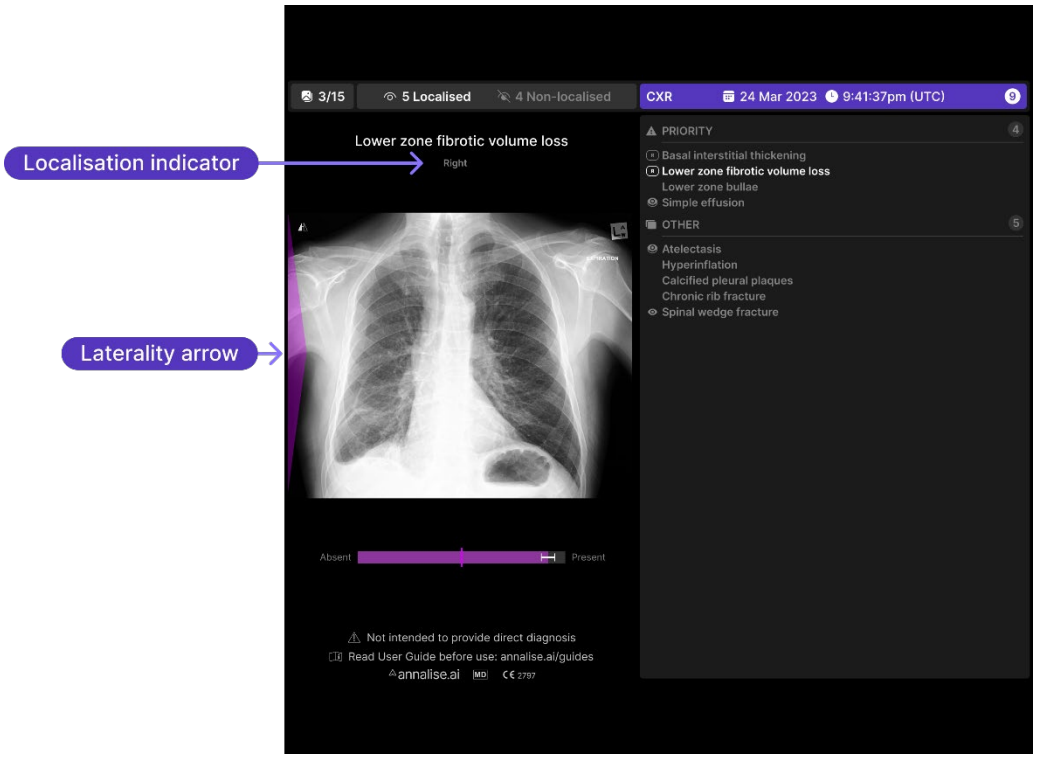
Localisation

The following example shows a study with localised findings.



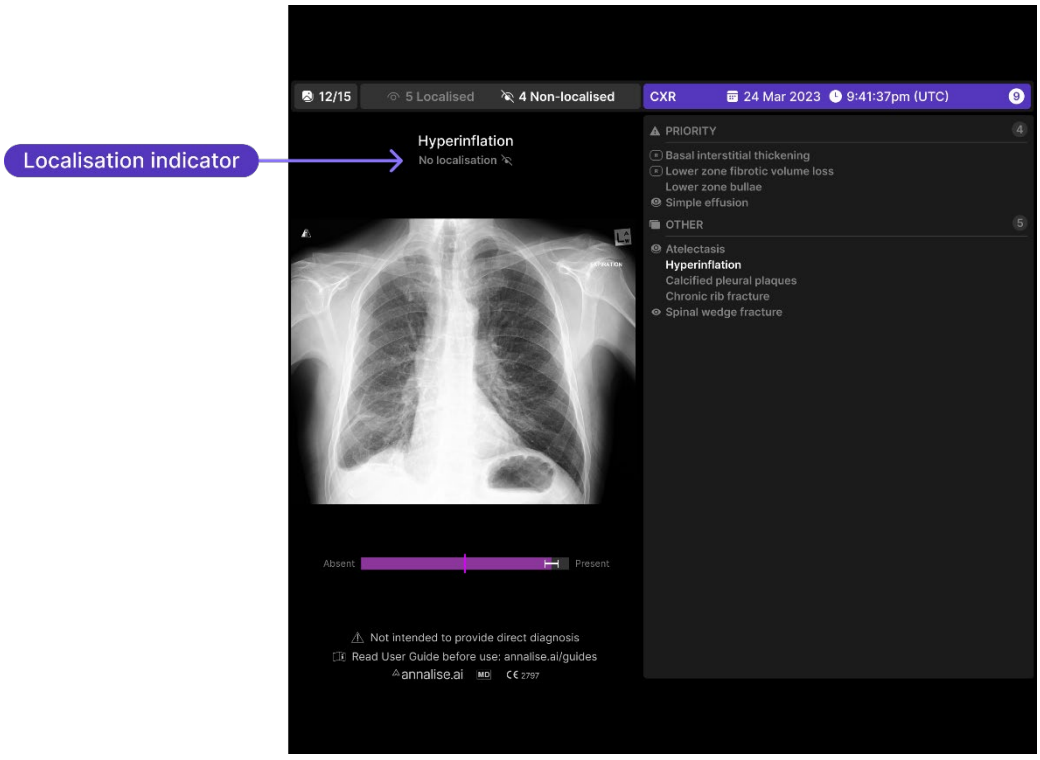
Laterality

The following example shows a study with localised findings (laterality).



Non-localised findings

The following example shows a study with non-localised findings.



Info bar components

The following components display on the Info bar:

Component	Details
Image counter	The **Image counter** indicates the position of the current image within the total number of images in the study.
Localised finding count	The total number of localised findings displayed in the result. The icon beside the finding count also displays in the Findings List to indicate that a finding is localised.
Non-localised finding count	The total number of non-localised findings displayed in the result. The icon beside the finding count also displays in the Findings List to indicate when a finding is non-localised.
Modality type	The **Modality type** indicates the current modality (i.e. CXR).
AI results time stamp	The date and time that the AI results were detected displays in the middle of the Info bar.
Finding count	The **Finding count** indicates the total number of findings detected in the result. This includes both the number of findings that display in the Findings List and the total number of detected findings.

Summary Panel components

The following components display on the Summary Panel:

Component	Details
Info bar	The **Info bar** displays at the top of the panel. See *Info bar components*, above.
Product description	The product name ('Annalise Enterprise') and product description.
Disclaimers	**'First available AI result'** If multiple predictions are triggered (for example, if additional images in the study were routed to Annalise Secondary Capture a few minutes after the first images were sent), only the first successfully completed AI result will display. See: • *Processed images* on page 45 • *Not all images in the study are present in the Secondary Capture result* on page 56 **'For trained clinicians only. Not for patient interpretation'** See *Intended user* on page 6.

continued

Component	Details
Finding instructions	The **Finding instructions** outline the available outcomes that can display while you are viewing images in the study. Each image will display one of these outcomes (depending on the findings detected). These include: • Localised findings *Key regions of interest are indicated.* • Laterality findings *Relevant sides of the body are indicated.* • Non-localised findings *Findings may not have any region of interest.* Note: These instructions do not display if there are no findings detected.
Processed images	The images that have been analysed in this study to produce the AI findings.
Scroll instructions	Depending on the options available on your PACS, you can use any of the following actions to scroll through the results: • click and drag • use the wheel on your mouse • use the arrow keys on your keyboard Note: These instructions do not display if no findings are detected.
Labelling details	Labelling details include: • product warning • instructions about reading the *Annalise Enterprise User Guide* before using the product • Annalise.ai trademark • Medical Device and CE labelling symbols Note: To check other labelling details (such as software version, UDI and manufacturer name and address), check the DICOM metadata in your PACS viewer.
Findings List	The **Findings List** includes all findings detected by the AI algorithm for the current study. You can access further details about these findings as you scroll through the list. See *Findings* on page 47. There are a maximum number of findings that can display. If the number of findings detected by the AI algorithm exceeds this number: • the highest priority findings will display first • the additional findings detected (but not shown) will have a lower priority than those that display • the number of additional findings detected (but not shown) will be indicated at the bottom of the Findings List Note: If no findings are detected, the 'No AI findings detected' message displays.

Finding Panel components

The following components display on the Finding Panel:

Component	Details
Info bar	See *Info bar components* on page 44.
Finding name	The **Finding name** displays the name of the current finding in the Findings List.
Localisation indicator	Indicates whether localisation is available for the current finding. Options that can display include: • **Right** – indicates right laterality • **Left** – indicates left laterality • **Bilateral** – indicates both left and right laterality • **No localisation** • [Blank] – indicates that localisation is available
Source image	The CXR image analysed in the study that is relevant to the current finding. Note: Each finding may display one or more source images as you scroll through the list.
Localisation	If localisation is associated with the current finding: • the **Localisation** icon will display beside the finding name, and • a region of interest outline will display over the relevant area in the image.
Laterality	If lateralisation is associated with the current finding, the **Laterality** icon will display beside the finding name. The icon indicates the side (or sides) of the body to which the finding relates: • **L** – Left • **R** – Right • **L + R** – Bilateral A purple **Laterality arrow** will also indicate laterality on the left, right (or bilateral) sides of the image.
Confidence bar	The **Confidence bar** provides a visual indication of the likelihood that a particular finding is present. It enables you to see the relationship between the **Confidence threshold** and the 95% **Confidence interval**.
Confidence threshold	The **Confidence threshold** is the score below which the AI model is no longer confident that a finding is present.
Confidence Interval	The 95% **Confidence Interval** is a fixed number that's added to or subtracted from the calculated confidence score. It indicates the probability of the AI model reporting a false positive (i.e. not actually present in the image).

continued

Function	Details
Confidence Interval	The 95% **Confidence Interval** is a fixed number that's added to or subtracted from the calculated confidence score. It indicates the probability of the AI model reporting a false positive (i.e. not actually present in the image).
Labelling details	See *Labelling details* on page 45.
Finding groups	**Finding groups** are located on the Findings List. All findings are grouped according to status or type. Each finding has both a pre-defined display order and a group to which it belongs. The following default groups* display: • Priority • Other • Technical *This group displays if one or more findings are classified as 'technical' (i.e. non-anatomical artefacts which occurred during the X-ray or scan).* *Your organisation can request to configure the following: • group names • displaying certain findings only • adding another group, and/or • determining the findings that display within each group.
Group count	The **Group count** that displays beside each finding group indicates the number of findings in that group.
Findings	The suspected radiological findings detected by the AI model display in the Findings List. The name of the current finding will be highlighted as you scroll through the list. If the model detects that there aren't any findings for the study, the '*No findings detected*' message will display.
Finding icons	The following icons display in the Findings List when localisation or laterality is associated with the finding.
Localisation	Localisation is associated with the finding.
Multiple localisations (CXR)	Localisation is available on multiple views.
Laterality	Indicates the side (or sides) of the body to which the finding relates: • **L** – Left • **R** – Right • **L + R** – Bilateral See *Laterality* on page 19.

Getting started: Annalise Secondary Capture

Overview

This section shows you how to:

- access Annalise Secondary Capture, and
- view the results.

Access Annalise Secondary Capture

Annalise Secondary Capture results are inserted into your PACS and display alongside the patient's source images.

1. Go to your PACS and open the patient study.

   The Annalise Secondary Capture results will automatically display as an additional series within the patient study.

View the results

1. Select the Annalise Secondary Capture series and scroll through the results to view the AI model findings.

   More than one image may display per finding.

   See:

   - *Finding Panel* on page 42
   - *Finding Panel components* on page 46
   - *Scroll instructions* on page 45

2. Go to *Review AI findings* on page 49.

Using Annalise Secondary Capture

Overview

Annalise Secondary Capture displays the suspected radiological findings for a study in the Findings List (the results that display depend on the configuration set by your organisation).

This section shows you how to:

- review the AI findings
- interpret the confidence level of each finding

Review AI findings

Multiple findings with varying degrees of confidence may display. In these instances, it is important to use your clinical judgement when reviewing all findings.

1. Use the following functions to help you review the findings:

Function	Details
Show images analysed for the current study	The Summary Panel displays the images analysed for the current study (and their associated view). See: • *Summary Panel* on page 40 • *Summary Panel components* on page 44
Identify the number of findings present	A number displays in the following locations to indicate the number of findings identified by the AI model: • **Finding count** on the Info bar (total number of findings) • **Group count** next to each finding group (total for that group)
Review regions of interest (ROI)	If present, regions of interest will be highlighted on the image.
View localisation	If localisation is associated with a finding, the **Localisation** icon will display next to the finding name and a region of interest outline will display on the image. See: • *Localisation* on page 46 • *Finding icons* on page 47
View laterality	If the finding is not localised to a specific area, the **Laterality** icon will display next to the finding name and a purple arrow (or arrows) will display on the image. See: • *Laterality* on page 46 • *Finding icons* on page 47
Localisation does not display	If localisation is not associated with a finding, the image will not be highlighted and no icon will display in the Findings List. To check which findings display localisation, see the *Findings list* on page 59.

Interpret the confidence level

A default confidence threshold for each finding will be provided for your organisation. For a finding to be considered present in the study, it must therefore have a score greater than this threshold.

For each finding, the AI model provides:

- a prediction score, and
- a 95% confidence interval.

This information is displayed on the Confidence bar in the Image Panel.

See:

- *Confidence bar* on page 19
- *Confidence threshold* on page 19
- *Confidence Interval* on page 19

Refer to the following examples:

Confidence level	Interpretation
Higher confidence	• The prediction score is above the confidence threshold • The confidence interval is above the confidence threshold • The finding is most likely present in the study 
Lower confidence	• The prediction score is above the confidence threshold • The lower border of the confidence interval is below the confidence threshold • The finding may be present in the study 

Troubleshooting and support

Troubleshooting

Problems and solutions

If you have issues with the Annalise Enterprise application, refer to the following tables:

- *Error codes: Annalise Viewer*, below
- *Other solutions: Annalise Viewer* on page 55
- *Other solutions: Annalise Secondary Capture* on page 56

If you are still unable to resolve the issue, contact the Annalise.ai Professional Services Team.

Error codes: Annalise Viewer

No.	Issue	Solution
001	Invalid ID or password.	Try signing in again using a valid ID and password. For further assistance, contact your internal IT support team.
002	Unsupported Annalise Viewer version or licence.	Contact your internal IT support team and quote the error code.
003	Annalise servers are currently unavailable.	Contact your internal IT support team and quote the error code.
004	Annalise servers are currently offline.	Check your internet connection. If your internet connectivity is OK and the problem continues, contact your internal IT support team.
005	Either the study is not supported, or the study may not have reached the Annalise Integration Adapter. If the study was recently performed, it may not have been forwarded to Annalise Enterprise.	If the problem continues, contact your internal IT support team.
006	Annalise Enterprise only supports studies for patients who are: • 16 years or older (for CXR), or • 18 years or older (for CTB). Annalise Enterprise uses DICOM tags to determine age.	Contact your internal IT support team.

continued

Error codes: Annalise Viewer (cont.)

No.	Issue	Solution
007 008	The study does not meet minimum requirements for AI processing: • Annalise Enterprise only supports studies containing chest X-rays or brain CT scans • the study must contain at least one PA or AP image or supported CT views (see *Supported scan types* on page 9) Annalise Enterprise includes an AI feature that determines whether: • the image is a chest X-ray or brain CT, and • if there is a PA or AP image or supported brain image. AI models have an error margin. On rare occasions, Annalise Enterprise will not recognise a chest X-ray or brain CT and this error will display.	For further details, contact your internal IT support team and quote the error code.
009 010 011	An unexpected error occurred while analysing the study.	Contact your internal IT support team and quote the error code.
014	Annalise servers are currently unavailable.	
015 016 020	The study cannot be requested from Annalise servers.	
021 022	An unexpected error occurred while analysing the study.	
023	Study exceeds the allowed number of images per CXR study.	Contact your internal IT support team.
026	The study cannot be requested from Annalise servers.	Contact your internal IT support team and quote the error code.
027	Cannot connect to your PACS as the port is already in use.	
029 030	The study has not yet completed AI processing.	Wait for a few moments then try opening the study again. If the problem continues, contact your internal IT support team.
031	An unexpected error occurred while analysing the study.	Contact your internal IT support team and quote the error code.

continued

Error codes: Annalise Viewer (cont.)

No.	Issue	Solution
032 033 034 035 036 037 038 039 040 041 042 043 044 045 046 047 048 049 050 051	The study does not meet the minimum requirements for AI processing: • Annalise Enterprise only supports studies containing chest X-rays or brain CT scans • the study must contain at least one PA or AP image or supported CT views (see *Supported scan types* on page 9) Annalise Enterprise includes an AI feature that determines whether: • the image is a chest X-ray or brain CT, and • if there is a PA or AP image or supported brain image. AI models have an error margin. On rare occasions, Annalise Enterprise will not recognise a chest X-ray or brain CT and this error will display.	For further details, contact your internal IT support team and quote the error code.
052	The application is currently undergoing maintenance (such as installing upgrades).	Once maintenance is complete, you will be able to use the application as normal.
053	The study does not meet the minimum requirements for AI processing: • Annalise Enterprise only supports studies containing chest X-rays or brain CT scans • the study must contain at least one PA or AP image or supported CT views (see *Supported scan types* on page 9) Annalise Enterprise includes an AI feature that determines whether: • the image is a chest X-ray or brain CT, and • if there is a PA or AP image or supported brain image. AI models have an error margin. On rare occasions, Annalise Enterprise will not recognise a chest X-ray or brain CT and this error will display.	For further details, contact your internal IT support team and quote the error code.
099	An unexpected error occurred while analysing the study	Contact your internal IT support team and quote the error code.

Other solutions: Annalise Viewer

Problem	Solution
Missing server settings Organisation details are incomplete.	Contact the Annalise.ai Professional Services Team.
Application unresponsive After loading a study in the PACS viewer, the Annalise Viewer does not respond.	Follow these steps: 1. Check that the study is a CR (Computed Radiography), DX (Digital Radiography) or CT brain. 2. Go to your taskbar and click the Desktop Peek area twice. 3. Quit the Annalise Viewer, then open it again. 4. Attempt to re-load the study. If the problem persists, contact the Annalise.ai Professional Services Team.
Application unresponsive with Sectra PACS The Annalise Viewer is unresponsive when a study is loaded. Sectra PACS warns that the viewer is out of sync.	Follow these steps: 1. Ensure the Annalise Viewer Adapter is running in the System Tray. 2. Ensure the Sectra Desktop Sync functionality is enabled. 3. Quit then restart the Annalise Viewer Adapter. If required, contact your internal IT support team for assistance.
Unexpected finding change When viewing a study, the AI findings change unexpectedly.	Some software systems may encounter this error when viewing studies in multiple windows. The Annalise Viewer will synchronise with the currently selected window. Ensure that the shortcut key mapping in the PACS viewer is mapped correctly.

continued

Other solutions: Annalise Secondary Capture

Problem	Root cause	Steps to resolve
There is no Secondary Capture series available	Any of the following may have occurred: • the study may still be processing • the study may be out of scope • the study might not have reached the Annalise Integration Adapter • there might be a connectivity issue or a technical product error • if the study was performed recently, it might not have been forwarded to Annalise Enterprise	Wait a few moments then check whether the Secondary Capture series displays in the PACS. If the series still doesn't display, check that the study meets all the criteria for processing. See: • *Contraindications* on page 6 • *Supported scan types* on page 9 If the problem persists, contact your internal IT support team.
One or more images in the Secondary Capture series is missing	There could be a connectivity issue, or a technical product error may have occurred.	Wait a few moments then check whether the Secondary Capture series displays in the PACS. If the problem persists, contact your internal IT support team.
Not all images in the study are present in the Secondary Capture result	Not all X-ray images in the study have been routed to the Annalise Integration Adapter. Annalise Secondary Capture results will only be sent for the first successfully completed AI result. If further images arrive after the first prediction is triggered, the new Secondary Capture results will not be sent to the PACS.	Contact your internal IT support team.

Support

Support and feedback

Refer to the following table for support and feedback details:

Support type	Details
Professional services, technical support, product feedback and complaints	Email *support@annalise.ai* Any serious incidents related to the device/s should be reported to Annalise.ai, and where applicable, the competent authority or regulatory authority in which the user and/or patient is established.
Product user, performance and administration guides	Check our website: *annalise.ai/guides*

Symbol glossary

Definitions of symbols that may appear on the Annalise Enterprise device or in the related documentation are listed below.

Symbol	Information
CE 2797	CE labelling
	Manufacturer
EC REP	European Authorised Representative
CH REP	Swiss Authorised Representative
	Indicates a warning or caution
	Read the instructions for use
MD	Medical device

Appendices

Findings list

Overview

The clinical development of the Annalise CXR and Annalise CTB ontology trees enabled Annalise Enterprise to identify a comprehensive list of radiological findings that would be most clinically necessary and helpful to clinicians.

These findings are referred to as the 'findings list'.

For information on the performance of the AI model, refer to the *Annalise Enterprise Performance Guide*.

Annalise CXR findings list

The Annalise CXR findings list is outlined below.

CXR finding	Definition	Localisation available
Abdominal clips	Surgical clips in the abdomen.	No
Acute clavicle fracture	Cortical breach of a clavicle. May be difficult to see if nondisplaced. No callus formation for acute fractures.	Yes
Acute humerus fracture	Cortical breach of the humerus; usually at the surgical neck of the humerus.	Yes
Acute rib fracture	Cortical breach of a rib without callus formation or union. Does not include surgical rib resection or thoracotomy.	Yes
Airway stent	Stents within the trachea or bronchi.	No
Aortic arch calcification	Calcification of the aortic arch. Does not include mitral valve calcification, descending aortic or pericardial calcification. Only includes Grade 2 or Grade 3 calcification (i.e. thick calcification).	No
Aortic stent	Stent/graft in the aorta.	No
Atelectasis	Includes subsegmental collapse, linear and bibasal atelectasis.	Yes
Axillary clips	Surgical clips in the axilla.	Yes
Basal interstitial thickening	Opacities within pulmonary lobules in a linear/branching pattern affecting predominantly lower zones of one or both lungs. Also includes thickened chronic fibrotic changes from lung scarring. May still be predicted if there are upper-zone changes as long as the pattern is lower-zone predominant.	Yes

CXR finding	Definition	Localisation available
Biliary stent	Stents within the biliary tree.	No
Breast implant	Breast prosthesis, usually of gel-like material implanted behind or in place of the female breast, as cosmetic or reconstructive surgery.	No
Bronchiectasis	Dilation of the bronchi. Can be localised or diffuse.	No
Calcified axillary nodes	Calcified soft tissue density in the axilla.	No
Calcified granuloma (< 5mm)	Calcified intraparenchymal lesion (or lesions) which are smaller than 5mm.	No
Calcified hilar lymphadenopathy	Calcified lymph nodes in hilum.	No
Calcified mass (> 5mm)	One or more intraparenchymal lesions (> 5mm) which may be partially or completely calcified.	Yes
Calcified neck nodes	Calcified soft tissue density in the neck.	No
Calcified pleural plaques	Calcified thickening along the pleura at the diaphragm, lateral thoracic wall or apex.	No
Cardiac valve prosthesis	Replacement of native cardiac valve. Includes transcatheter aortic valve implantation.	No
Cavitating mass(es)	Lucent walled lesion which arises from a solid lesion that then develops gas within it. As a result, the wall is typically thickened.	Yes
Cavitating mass with content	Collection of air with air fluid level or in crescent shape that separates the wall of a cavity from an inner mass.	Yes
Cervical flexion	The chin is visible and obscuring the apex of the lung or superior mediastinum. Only the primary AP or PA view is assessed, not the lateral view or any other view/post-processed image.	No
Chronic clavicle fracture	Corticated clavicle fractures with surrounding callus formation or union.	No
Chronic humerus fracture	United, malunited or non-united humerus fracture.	No
Chronic rib fracture	Cortical breach of a rib with surrounding callus formation or union.	No
Clavicle fixation	Internal fixation of clavicle fractures. When a fracture has been fixed, the acute clavicle fracture may not be predicted.	Yes

CXR finding	Definition	Localisation available
Clavicle lesion	Sclerotic or lytic, malignant or benign lesion within the clavicle with or without pathological fracture. Includes lesions due to systemic conditions such as myeloma, osteogenesis imperfecta and renal osteodystrophy.	Yes
Coronary stent	Stents within the coronary arteries.	No
Diaphragmatic elevation	Left hemidiaphragm is higher than the right, or the right hemidiaphragm is more than 3cm higher than the left. Only applies to the inspiratory view, not the lateral or expiratory views.	No
Diaphragmatic eventration	Abnormal contour of the diaphragm affecting only a segment of the hemidiaphragm.	No
Diffuse airspace opacity	Diffuse ill-defined airspace/ground glass opacity or consolidation throughout one or both lungs.	Yes
Diffuse bullae	Multiple large lucencies due to emphysema in the upper and lower zones of one or both lungs.	No
Diffuse fibrotic volume loss	Opacities within pulmonary lobules in a linear/branching fashion affecting one or both lungs. Upper and lower zones affected. Associated with volume loss (hilar displacement, diaphragmatic elevation, tracheal displacement). Also includes thickened chronic fibrotic changes from lung scarring.	Yes
Diffuse interstitial thickening	Opacities within pulmonary lobules in a linear/branching pattern affecting both upper and lower zones of one or both lungs. Also includes thickened chronic fibrotic changes from lung scarring.	Yes
Diffuse lower airspace opacity	Diffuse ill-defined airspace/ground glass opacity or consolidation in predominantly the lower zones of one or both lungs. Does not include interstitial opacities. May still be predicted if there are upper-zone changes as long as the pattern is lower-zone predominant.	Yes
Diffuse nodular or miliary lesions	Multiple tiny lung opacities of one or both lungs. Usually innumerable and too small to measure. May be calcified.	Yes
Diffuse pleural thickening	Pleural masses/opacities in multiple locations. Pleural mass is distinguished from intraparenchymal mass by having an obtuse angle with the pleura.	No

CXR finding	Definition	Localisation available
Diffuse spinal osteophytes	Flowing osteophytes at the anterior or right lateral vertebral body connecting at least four contiguous vertebrae. Typically, smooth and thin connections.	No
Diffuse upper airspace opacity	Diffuse ill-defined airspace/ground glass opacity or consolidation in predominantly the upper zones of one or both lungs. Does not include interstitial opacities. May still be predicted if there are lower-zone changes as long as the pattern is upper-zone predominant.	Yes
Distended bowel	Pathologically distended small or large bowel loops or stomach. Small bowel loops must measure > 3cm and large bowel loops > 6cm, or the stomach causes mass effect upon the diaphragm. Air fluid levels may be present on erect view.	No
Electronic cardiac devices	Pacemakers, pacing wires (internal or external), internal defibrillators and loop recorders. ECG leads do not count as electronic cardiac devices.	No
Focal airspace opacity	Single area of consolidation or air space/ground glass opacity in the lung. Air bronchogram may be present.	Yes
Gallstones	Calcified RUQ stones projected over the gallbladder.	No
Gastric band	Band around the gastro-oesophageal junction.	No
Hiatus hernia	Sliding or paraoesophageal hiatus hernia into the posterior mediastinum. Retrocardiac fluid level may be present.	No
Hilar lymphadenopathy	Increase in size and density of the hila with loss of normal hilar angle.	No
Humeral lesion	Sclerotic or lytic, malignant or benign lesion within the humerus with or without pathological fracture. Includes lesions due to systemic conditions such as myeloma, osteogenesis imperfecta and renal osteodystrophy.	Yes
Hyperinflation	Increased total lung volumes as evidenced by flattening of the diaphragm or increased retrosternal clear space on lateral view (or both).	No
Image obscured	Image obscured by object.	No

CXR finding	Definition	Localisation available
Incompletely imaged chest	Part of the lungs not included in the image. May be predicted if any image in the series is incomplete.	No
Inferior mediastinal mass	Masses within the mediastinum with the centre of the mass below the superior border of the aortic arch.	No
In position CVC	Internal jugular lines, subclavian lines and peripheral inserted catheters (PICC). Central venous lines should be placed with the tip in the SVC/cavoatrial junction. The line should not be in the brachiocephalic, subclavian veins, or right atrium.	Yes
In position ETT	Endotracheal or tracheostomy tube within the trachea for ventilation. Needs to be 3cm to 7cm above the carina.	No
In position NGT	Enteric tube from the mouth/nose into the stomach for feeding or drainage.	Yes
In position PAC	Pulmonary artery catheter with tip within the pulmonary artery or main pulmonary trunk.	No
Intercostal drain	This finding could mean either of the following: • Malpositioned intercostal drain: ICC with tip or side holes not within the pleural cavity; typically migrates out into the soft tissue • In-position intercostal drain: Catheter within the pleural space to drain fluid and/or gas	Yes
Internal foreign body	Non-surgical internal foreign bodies, such as inhaled foreign bodies or gunshot shrapnel, that are internal to the patient.	Yes
Kyphosis	Increased kyphosis of the thoracic spine with Cobb angle greater than 45 degrees on lateral view. Usually predicted off the lateral view.	No
Loculated effusion	Fluid within the pleural cavity that is trapped within a fissure or at the apex or lateral wall on an erect view.	Yes
Lower zone bullae	Multiple large lucencies due to emphysema in the lower zones of one or both lungs. May still be predicted if there are upper-zone changes as long as the pattern is lower-zone predominant.	No

CXR finding	Definition	Localisation available
Lower zone fibrotic volume loss	Opacities within pulmonary lobules in a linear/branching pattern affecting one or both lungs. Lower zone predominant. Associated with volume loss (diaphragmatic elevation). Also includes thickened chronic fibrotic changes from lung scarring. May still be predicted if there are upper-zone changes as long as the pattern is lower-zone predominant.	Yes
Lung collapse	Collapse of the entire lung or most of the lung.	Yes
Lung sutures	Suture material within then lung parenchyma, which is typically post lung resection.	No
Mastectomy	Absence or asymmetry of breast shadows suggesting mastectomy or partial mastectomy.	No
Mediastinal clips	Surgical clips in the mediastinum or hilum. Typically, small clips from coronary artery bypass grafts. Hilar clips from lung surgery also fall under this category.	No
Multifocal airspace opacity	Multiple areas of ill-defined airspace/ground glass opacity or consolidation.	Yes
Multiple masses or nodules	More than one pulmonary mass/nodule.	No
Neck clips	Any surgical clips in the neck.	Yes
Nipple shadow	Rounded well-defined density projected over the expected locations of the nipple; sometimes bilateral.	No
Oesophageal stent	Stents within the oesophagus.	No
Osteopaenia	Severe reduced apparent bone density of the vertebrae such that there is difficulty distinguishing between bone and adjacent soft tissues, even when windowing appropriately. Usually predicted off the lateral view.	No
Overexposed	Unable to see lung markings even after appropriate windowing. Only the primary AP or PA view is assessed, not the lateral view or any other view/post-processed image.	No

CXR finding	Definition	Localisation available
Patient rotation	The spinous process is laterally displaced by more than a quarter of the interclavicular distance. Only the primary AP or PA view is assessed, not the lateral view or any other view/post-processed image. If the patient is severely scoliotic, this finding may be unreliable.	No
Pectus carinatum	Congenital chest wall deformity with anterior protrusion of the sternum.	No
Pectus excavatum	Congenital chest wall deformity with concave depression of the sternum.	No
Peribronchial cuffing	Thickening of the bronchial wall without dilation of the bronchial lumen.	No
Pericardial fat pad	Fat pad adjacent to the heart border. Can be mistaken for consolidation by referrers.	No
Perihilar airspace opacity	Diffuse perihilar airspace/ground glass opacity of one or both lungs. Does not include interstitial opacities. Can still be predicted if there are other changes as long as the pattern is perihilar predominant.	Yes
Pleural mass	Pleural mass/opacity in one location. Pleural mass is distinguished from intraparenchymal mass by having an obtuse angle with the pleura. A pleural mass is either nodular thickening of the pleura or pleural thickening greater than 1cm. The pleural mass should affect less than half the lung height and is unilateral. Local pleural thickening less than 1cm is usually ignored.	Yes
Pneumomediastinum	Gas within the mediastinum, typically outlining the pericardium and mediastinal margin.	No
Post resection volume loss	Volume loss due to resection of lung (e.g. pneumonectomy, lobectomy or segmentectomy) usually with staples/clips visible.	Yes
Pulmonary artery enlargement	Enlargement of the pulmonary artery typically with loss of the aortopulmonary window. Width of the right descending pulmonary artery > 17mm on the PA film.	No
Pulmonary congestion	Upper lobe diversion with loss of tapering of vessels towards the apices with upper zone vessels having similar or larger diameter compared with lower zone. Only reliable on erect views.	No
Reduced lung markings	Reduced lung markings.	No

CXR finding	Definition	Localisation available
Rib fixation	Internal fixation of rib fractures. May not be predicted if the fracture has been fixated.	Yes
Rib lesion	Sclerotic or lytic, malignant or benign lesion within the rib with or without pathological fracture. Includes lesions due to systemic conditions such as myeloma, osteogenesis imperfecta and renal osteodystrophy. Congenital rib anomalies such as bifid or fused ribs are not included.	Yes
Rib resection	Surgical removal of ribs (may be multiple). Typically, thoracotomies are performed for lung resection.	No
Rotator cuff anchor	Bone anchors within the humeral heads.	Yes
Scapular fracture	Cortical breach of the scapula. Includes both acute and chronic fractures.	Yes
Scapular lesion	Sclerotic or lytic, malignant or benign lesion within the scapula with or without pathological fracture. Includes lesions due to systemic conditions such as myeloma, osteogenesis imperfecta and renal osteodystrophy.	Yes
Scoliosis	Increased lateral curvature of the thoracic spine with Cobb angle greater than 10 degrees on frontal view.	No
Segmental collapse	Collapse of entire segment or lobe of the lung, or compressive collapse from adjacent pleural effusion.	Yes
Shoulder arthritis	Loss of joint space, osteophyte formation, sclerosis and degenerative changes of the glenohumeral joint. Usually only predicted if there are significant changes, i.e. near-complete loss of joint space.	No
Shoulder dislocation	Humeral head not articulating with glenoid fossa. Typically anterior and inferior dislocation.	Yes
Shoulder fixation	Internal fixation of humerus or scapula fractures. May not be predicted if the fracture has been fixated.	Yes
Shoulder replacement	Total, partial or reverse total shoulder replacement.	Yes

CXR finding	Definition	Localisation available
Simple effusion	Fluid within the pleural cavity. In an erect radiograph this accumulates at the base. May form a meniscus.	Yes
Simple pneumothorax	Air within the thoracic cavity outside of the lung. May be associated with lung edge.	Yes
Solitary lung mass	Single rounded well-defined opacity. Measures 3cm or larger.	Yes
Solitary lung nodule	Single rounded well-defined opacity. Measures less than 3cm.	Yes
Spinal arthritis	Near-complete loss of intervertebral space, fusion of vertebrae, or heavy calcification of intervertebral discs at multiple levels.	No
Spinal fixation	Internal fixation of the spine for fractures or degeneration.	No
Spinal lesion	Sclerotic or lytic, malignant or benign lesion within the thoracic spine with or without pathological fracture. Includes lesions due to systemic conditions such as myeloma, osteogenesis imperfecta and renal osteodystrophy.	Yes
Spinal wedge fracture	Acute or chronic compression, wedge, distraction or translated fractures. Typically seen on lateral view. Usually, chronicity cannot be reliably assessed so this is not differentiated. For compression or wedge fractures, there should be more than 20% loss in anterior height or central height as measured to the nearest normal vertebra or posterior vertebral body height (whichever is larger).	Yes
Sternotomy wires	Metallic wires fixating a sternotomy.	No
Subcutaneous emphysema	Air within the soft tissues outside the abdominal or thoracic cavity. May be associated with pneumothorax or pneumomediastinum.	Yes
Subdiaphragmatic gas	Gas below the diaphragm not contained within a lumen.	No
Suboptimal CVC	Central venous catheter (CVC) or peripherally inserted central venous catheter (PICC) line where the tip of the catheter is not positioned at the cavoatrial junction or the distal SVC, or if the catheter is looped or kinked.	Yes
Suboptimal ETT	Endotracheal or tracheostomy tube that is either too close to the carina or too far from it (not within 3cm to 7cm) or is within a bronchus.	No

CXR finding	Definition	Localisation available
Suboptimal gastric band	Band around the gastro-oesophageal junction with phi angle between the band and the spine not within 0 to 60 degrees. Malpositioned bands may be associated with oesophageal dilation.	No
Suboptimal NGT	Nasogastric tube (NGT) where the tip and the side holes are not projected within the stomach, or the tip of the NGT is not visible and the image is cut-off within 5cm of the gastro- oesophageal junction. May be within the oesophagus or bronchus.	Yes
Suboptimal PAC	Pulmonary artery catheter with tip not in the main pulmonary trunk or pulmonary arterial branch (e.g. in the right ventricle), or if the catheter is looped or kinked.	No
Superior mediastinal mass	Masses within the mediastinum with the centre of the mass above the superior border of the aortic arch/loss of paratracheal stripes. If the patient is supine or rotated, the superior mediastinum can be widened due to benign causes such as venous distension or projection.	No
Tension pneumothorax	Air within the thoracic cavity outside of the lung. May be associated with lung edge. Resultant mediastinal shift.	Yes
Tracheal deviation	Moving of the trachea across to one side secondary to increased pressure on one side or decreased pressure on the other side. Consideration of the extent of patient rotation must be taken into account.	No
Underexposed	Outline of any thoracic vertebral bodies not visible. Only the primary AP or PA view is assessed, not the lateral view or any other view/post-processed image.	No
Underinflation	The diaphragm is projected above the 9th posterior rib in a PA view or above the 7th rib in an AP view.	No
Unfolded aorta	Widening of the aortic curve while maintaining a normal aortic diameter.	No
Upper interstitial thickening	Opacities within pulmonary lobules in a linear/branching pattern affecting predominantly upper zones of one or both lungs. Also includes thickened chronic fibrotic changes from lung scarring. Can still be predicted if there are lower-zone changes as long as the pattern is upper-zone predominant.	Yes

CXR finding	Definition	Localisation available
Upper zone bullae	Multiple large lucencies due to emphysema in the upper zones of one or both lungs. May still be predicted if there are lower-zone changes as long as the pattern is upper-zone predominant.	No
Upper zone fibrotic volume loss	Opacities within pulmonary lobules in a linear/branching pattern affecting one or both lungs. Upper zone predominant. Has associated volume loss (hilar elevation). Also includes thickened chronic fibriotic changes from lung scarring. Includes apical scarring (e.g. from previous TB). Can still be predicted if there are lower-zone changes as long as the pattern is upper-zone predominant.	Yes
Widened aortic contour	Widening of the aortic arch diameter to 4.5cm or greater, or the descending aorta to 4cm or greater, typically due to aneurysm, dissection or rupture.	No
Widened cardiac silhouette	Increased cardiothoracic ratio > 0.5 on PA view and > 0.6 on AP view. Includes cardiomegaly and enlarged cardiac silhouette due to pericardial effusion.	No

Annalise CTB findings list

The Annalise CTB findings list is outlined below.

CTB finding	Definition	Localisation available
Abnormal prominent vessels	Prominence of vessels in the brain or along the surface of the brain, consistent with a vascular malformation. May contain haemorrhage.	Yes
Acute brainstem infarct	Acute hypodensity of brainstem (within two weeks).	Yes
Acute cerebellar infarct	Hypodensity of cerebellum in vascular distribution or with history consistent with acute infarct. Subacute infarct is also included if under two weeks old or maintains mass effect. Does not include old infarcts.	Yes
Acute cerebral infarct	Acute infarct in any cerebral artery territory secondary to thrombo-embolism, vasospasm, vascular compression or dissection.	Yes
Acute haemorrhagic infarct	Acute infarct in any cerebral artery territory containing frank haemorrhage.	Yes
Acute infarct petechial haemorrhage	Acute infarct in any cerebral artery territory containing petechial haemorrhage.	Yes
Acute intraparenchymal haemorrhage	Acute haematoma (hyperdense) in the cerebral hemispheres (including basal ganglia and periventricular), brainstem or cerebellum.	Yes
Acute lacunar infarct	Mild ill-defined hypodensity of basal ganglia, thalami or deep white matter consistent with acute lacunar infarct. Does not include old lacunar infarcts.	Yes
Acute on chronic subdural haematoma	Mixture of hyperdense and hypodense crescent-shaped subdural haematoma extending over the cortical surface of the brain.	Yes
Acute peripheral infarct	Small acute hypodensities of cortex or subcortical white matter due to small infarcts, usually from a central embolic cause or fragmented emboli from large vessel.	Yes
Acute subdural/extradural haematoma	Hyperdense crescent-shaped haematoma extending over the cortical surface of the brain.	Yes
Acute watershed infarct	Acute infarct in deep and/or superficial watershed distributions between vascular territories, usually from thrombo-embolic disease, global hypotension or vasospasm.	Yes

CTB finding	Definition	Localisation available
Aggressive bone lesion	Lytic bone lesion in calvarium with favoured aggressive appearances (wide zone of transition, aggressive periosteal reaction).	Yes
Aggressive extra-axial mass of soft tissue	Aggressive mass in the extra-axial space, typically a Grade II or Grade III meningioma, haemangiopericytoma or dural metastasis. Invades into skull or causes aggressive periosteal reaction.	Yes
Aggressive meningeal thickening	Localised or nodular dural thickening, greater than 5mm in thickness. May be associated with vasogenic oedema. Includes leptomeningeal carcinomatosis.	Yes
Aggressive skin lesion	Soft tissue density thickening of the scalp or skin in face or neck with aggressive features such as osseous invasion.	Yes
Air fluid level paranasal sinuses	Acute fluid collection or blood in the paranasal sinuses.	No
Aneurysm	Rounded density in the region of a vessel, consistent with an aneurysm.	Yes
Aneurysm coils	Metallic coils placed within the lumen of an aneurysm.	No
Arachnoid cyst	Subdural or extradural collection of CSF density (e.g. arachnoid cyst or pseudomeningocele, or epidermoid cyst).	Yes
Basal ganglia and dentate calcification	Calcification of the basal ganglia and dentate nuclei, usually physiological, due to aging but can be pathological (e.g. metabolic disorders or Fahr's disease). Usually only predicted if more than 4 small specks, each of size > 3mm, or at least one single larger speck > 5 mm in length.	No
Cerebellar atrophy	Prominent cerebellar fissures and enlarged 4th ventricle due to volume loss of cerebellar parenchyma disproportionate to the patient's age.	No
Cerebral atrophy	Prominent sulci and enlarged ventricles due to volume loss of cerebral parenchyma.	No
Cerebral convexity subarachnoid haemorrhage	Hyperdensity in subarachnoid space of the cerebral convexity sulci.	Yes
Chiari malformation	Cerebellar tonsillar ectopia extending 5mm or more below foramen magnum.	Yes
Chronic globe abnormality	Elongation of the globe due to scleral thinning (staphyloma) or protrusion of the globe through scleral defect (coloboma). Shrunken globe due to phthisis bulbi is also included in this finding.	Yes

CTB finding	Definition	Localisation available
Chronic or fungal sinusitis	Signs that indicate chronic or fungal infection of the sinus, i.e. calcification or hyperdensity within the mucosal opacity or thickening of the walls of the sinus.	No
Chronic subdural haematoma	Hypodense crescent-shaped CSF dense collection extending over the cortical surface of the brain. Includes subdural hygromas.	Yes
Cochlear implant	Electronic device with electrode implanted into the basal turn of cochlea to treat deafness.	No
Colloid cyst	A hyperdense or isodense cyst abutting the anterior roof of the third ventricle.	Yes
Colpocephaly	A descriptive term for a disproportionate prominence of the occipital horns of the lateral ventricles. It can result from a wide range of congenital insults (in particular, callosal agenesis).	No
Communicating hydrocephalus/NPH	Enlargement of the ventricular system involving all ventricles, without evidence of ventricular obstruction.	No
Corpus callosum agenesis/hypogenesis	Complete or partial absence of the corpus callosum due to developmental anomaly.	No
Cortical laminar necrosis	Gyriform hyperdensity (may be calcification or blood products) due to chronic cortical death, usually secondary to hypoxic/ischaemic insult. Associated with thinning of the cortex. Often associated with encephalomalacia.	No
Cortical or leptomeningeal calcification	Gyriform calcific density in the cortex. Can be secondary to old infarcts or congenital lesions like Sturge Weber, or post infectious causes.	No
Craniotomy/cranioplasty /craniectomy	Removal of calvarial bone. Includes replacement of calvarial bone by bone or implant. Also includes burr holes.	No
Craniotomy extra-axial collection	Collection of fluid or haematoma deep to the craniotomy site, commonly seen post craniotomy.	No
Deep brain stimulation electrodes	Electrodes extending through frontal lobes to basal ganglia, subthalamus or brainstem for treating movement disorders such as Parkinson's Disease.	No
Deep white or grey matter infarct	Small old hypodensity in periventricular white matter, lentiform nuclei, caudate, thalami, brainstem > 15mm. Due to old infarct in distribution of the perforating vessels.	No

CTB finding	Definition	Localisation available
Diffuse hypoxic-ischaemic encephalopathy	Generalised swelling of the gyri and loss of sulcal space. Can have loss of grey-white matter differentiation, or reversal of grey and white matter attenuation. Includes metabolic insults like methanol poisoning.	No
Dilated superior opthalmic vein	Dilated superior opthalmic vein of greater than 4mm diameter involving the whole length of the vessel within the orbit. May also be hyperdense due to thrombus.	Yes
Disappearing basal ganglia sign	Obscuration of basal ganglia due to reduced density in the setting of an acute MCA infarct.	Yes
Dural calcification	Calcification of the dura due to chronic haematoma or infection. Does not include physiological calcification of the falx.	No
Effacement of basal cisterns	Obscuration of the basal cisterns (e.g. suprasellar cistern or cisterna magna), due to mass effect caused by intra-axial or extra-axial lesions.	No
Empty sella	Pituitary fossa is largely empty of tissue. Often associated with expanded pituitary fossa.	No
Encephalomalacia	Focal loss of brain parenchymal volume due to chronic insult.	No
Entrapment of lateral ventricle	Enlargement of a portion of the lateral ventricle due to compression proximally by mass effect. Typically, entrapment occurs in the temporal horn of a lateral ventricle.	Yes
Erosion of bone in tympanic cavity	Erosion of the walls of the tympanic cavity, the ossicles or scutum as seen with cholesteatoma or tumours.	Yes
Exophthalmos	Greater than 23mm protrusion of the anterior surface of the globe beyond the interzygomatic line.	Yes
Expanded pituitary fossa	Enlargement of the pituitary fossa greater than 17mm in length and 13mm in height. Includes erosion of the dorsum sellae due to expanded sella from long-standing raised ICP.	No
Extracranial herniation	Brain herniation external to the inner table of the skull.	No

CTB finding	Definition	Localisation available
Extracranial Ventricular Drain (EVD)	Surgically placed drain, usually positioned in the anterior horn of a lateral ventricles, to reduce intraventricular pressure or surgically placed tubing to measure the intraventricular pressure.	No
Extradural haematoma	Biconvex, lens-shaped haematomas, often constrained by cranial sutures.	Yes
Face and neck haematomas	Haematoma in the neck or face which may be due to recent trauma or surgery.	No
Focal intra-axial calcification	Foci of calcification within the cerebral hemispheres, brainstem or cerebellum. May be a vascular lesion, such as a cavernoma, or chronic infection, such as cysticercosis.	Yes
Foreign body face and neck	Non-surgical foreign body in the soft tissues of the neck or face. Does not include surgically implanted devices or lines, or subcutaneous calcifications.	Yes
Foreign body orbit	Non-surgical foreign body in the orbit. Does not include surgically implanted devices or lines, or subcutaneous calcifications.	Yes
Foreign body scalp	Non-surgical foreign body in the soft tissues of the scalp. Does not include surgically implanted devices or lines, or subcutaneous calcifications.	Yes
Fourth ventricular effacement	Effacement, narrowing or compression of fourth ventricle due to mass effect.	No
Fracture of calvarium	Acute fracture line through the calvarium. Also includes suture diastasis secondary to trauma.	Yes
Fracture of skull base	Fracture involving the base of skull. Includes fractures of the occipital condyles.	Yes
Fracture paranasal sinuses/facial bones	Acute fracture of the facial bones including orbits, paranasal sinuses, nasal bone, maxilla, mandible. Fractures that have surgical fixation, even if recent, come under the definition of 'sino-nasal surgery'.	Yes
Generalised calvarial thickening	Bone density is increased throughout the calvarium. Includes thickening of calvarium due to Paget's or medication.	No
Haemorrhagic contusion	Hyperdense blood within a brain contusion due to head trauma. Common sites include the anterior frontal and temporal lobes.	Yes

CTB finding	Definition	Localisation available
Haemorrhagic lesion in sella	Haematoma in the sella and/or suprasellar region. Usually caused by haemorrhage into a pituitary adenoma often associated with pituitary apoplexy. Pituitary mass may be evident and may be hyperdense. Fluid-debris levels may also be evident. Also includes haematoma post transsphenoidal surgery.	Yes
Hyperdense artery in anterior circulation	Density consistent with clot in the lumen of the middle or anterior cerebral artery or branches.	Yes
Hyperostosis frontalis	Benign overgrowth of the inner table of the frontal bone, more common in women over 65 years old. Nodular bony formations on the inner table, protruding greater than 1cm in thickness beyond the adjacent normal component of the calvarium.	No
Hypopneumatised mastoid	Bone is present in the mastoid instead of air cells. The lack of pneumatised mastoid air cells is usually congenital or due to childhood mastoiditis.	No
Insular ribbon sign	Hypodensity of insular cortex, obscuring the border with the external capsule, in the setting of an acute MCA infarct.	Yes
Intraaxial lesion calcification	Any partially calcified mass lesion within the cerebrum, cerebellum or brainstem. Also applies to a cyst or mass that has a calcified component or wall.	Yes
Intraaxial lesion complex cyst	Complex cyst within the cerebrum, cerebellum or brainstem (not CSF). May have adjacent oedema.	Yes
Intraaxial lesion haemorrhage	Any mass lesion within the cerebrum, cerebellum or brainstem containing haemorrhage. Any intraaxial lesion can have 'intraaxial lesion haemorrhage' as an additional finding. Does not include haemorrhagic infarct or intraparenchymal haemorrhage with no underlying lesion.	Yes
Intraaxial lesion heterogeneous	Heterogeneous mass lesion within the cerebrum, cerebellum or brainstem with hypodense or hyperdense or isodense components.	Yes
Intraaxial lesion hyperdense	Homogeneous hyperdense cerebral, cerebellar or brainstem mass (e.g. due to lymphoma).	Yes

CTB finding	Definition	Localisation available
Intraaxial lesion hypodense	Homogeneous hypodense mass lesion within the cerebrum, cerebellum or brainstem. The density of the mass is relative to normal brain parenchyma (not the adjacent vasogenic oedema).	Yes
Intraaxial lesion isodense	Cerebral, cerebellar or brainstem mass, homogeneous and isodense relative to the surrounding brain parenchyma. The density of the mass is relative to normal brain parenchyma (not the adjacent vasogenic oedema).	Yes
Intra-ocular silicone	Intra-ocular injection of silicone (hyperdense) for treatment of retinal detachment.	Yes
Intra-ventricular haemorrhage	Acute haemorrhage (hyperdense) within the ventricular system. Causes fluid/fluid levels, usually seen in posterior horns of lateral ventricles. Can be due to trauma, hypertension or haemorrhagic lesions.	Yes
Left/right ventricular effacement	Effacement, narrowing or compression of lateral ventricle due to mass effect.	Yes
Mastoidectomy	Any type of mastoidectomy or surgery to petrous temporal bones.	Yes
Mastoid opacification	Partial or complete opacification of the mastoid air cells, typically secondary to fracture, mastoid effusion, or rarely mastoiditis.	No
Meningioma with hyperostosis of adjacent calvarium	Meningioma with hyperostosis of adjacent calvarium.	Yes
Metallic artefact	Streaking artefact (called beam hardening artefact) due to the presence of metallic density object in the field of image acquisition (e.g. braces or external frame).	No
Midline shift	Subfalcine herniation or displacement of the medial cerebral hemisphere or displacement of the mid cerebellum laterally by greater than 2mm.	Yes
Movement artefact	Artefact causing blurring and obscuration of the image due to motion of the patient during the scan.	No
Mucosal thickening	Greater than 5mm thickening of mucosa (over a length of more than 10mm) in the paranasal sinuses. Includes sino-nasal polyposis, mucosal retention cysts and polyps.	No
Non-aggressive extra-axial mass containing calcification	Meningioma containing areas of calcification.	Yes

CTB finding	Definition	Localisation available
Non-aggressive extra-axial mass without calcification or fat	Meningioma without aggressive features.	Yes
Non-aggressive skin lesion	Non-aggressive soft tissue lump in the scalp including sebaceous or epidermal cysts.	Yes
Obstructive hydrocephalus	Enlargement of one or more ventricles due to obstruction.	No
Old lacunar infarct	Small old hypodensity in lentiform nuclei, caudate, thalami, brainstem or periventricular white matter greater than 2mm and less than 15mm in diameter.	No
Opacity in tympanic cavity	Opacification of the middle ear cavity due to middle ear effusion, haemotympanum, chronic otitis media or cholesteatoma.	Yes
Orbital fat stranding	Ill-defined fat stranding in the orbit. May be due to orbital cellulitis or retro-orbital haemorrhage.	Yes
Orbital mass benign	Well-defined soft tissue mass or cystic lesion in the orbit (intra and extraconal) separate to the extra-ocular muscles. Includes vascular lesions and optic nerve sheath meningiomas.	Yes
Orbital mass inflammatory or malignant	Orbital mass which is ill-defined and may involve one or more extra-ocular muscles (in which case it usually involves the myotendinous junction). May have associated fat stranding.	Yes
Osteoma	Homogenous sclerotic benign lesion which can be in paranasal sinuses or skull vault.	Yes
Parotid lesion	Solid or cystic parotid lesions.	Yes
Perimesencephalic/ aneurysmal subarachnoid haemorrhage	Hyperdensity in subarachnoid space of the basal cisterns, interhemispheric fissure or sylvian fissures.	Yes
Petrous bone fracture	Fracture of the petrous temporal bones. Often longitudinal or transverse.	Yes
Pineal mass or complex cyst	Mass, cystic mass or complex cyst within the pineal region with soft tissue component greater than 1 cm in width and length.	Yes
Pneumocephalus	Subarachnoid, subdural or extradural collection of air density or intraventricular air.	Yes
Prominent perivascular spaces	CSF density spaces typically found below the basal ganglia at the anterior commissure level.	No

CTB finding	Definition	Localisation available
Prosthetic globe	Fabricated replacement of the globe in the orbit.	Yes
Resection cavity	Acute/subacute surgical resection cavity following excision of a mass which may contain blood, fluid or gas.	Yes
Scalp haematomas	Haematoma in the scalp, usually due to recent trauma or surgery. Includes post-surgical collection superficial to craniotomy.	No
Sella or suprasellar cyst, mass or cystic mass	Cyst, cystic/solid or solid mass in sella or suprasellar region. Includes pituitary tumours, Rathke's cleft cysts, suprasellar tumours and abnormal thickening of the pituitary stalk from inflammatory conditions (hypophysitis).	Yes
Simple pineal cyst	Simple cyst within the pineal region greater than 1 cm in diameter.	Yes
Sino-nasal, oral, mandibular and maxillofacial surgery	Evidence of previous sino-nasal surgery such as maxillary antrostomies or ethmoidal clearance and fixation of facial bone fractures.	No
Sinus soft tissue density lesion	Soft tissue density lesion in the sinus, secondary to organising haematoma or cancer.	No
Small vessel ischaemic disease	Chronic hypodensity in the white matter, (often confluent), typically in the periventricular or deep white matter.	No
Soft tissue mass neck	Any soft tissue mass in the neck or infratemporal fossa including abscesses/ masses at the fossa of Rosenmuller, oral and nasopharyngeal cavity masses, enlarged (> 1.5 cm short axis) or necrotic lymphadenopathy. Includes extra-osseous extension of bony lesions into the soft tissue, soft tissue mass in the face and calcified nodes in the neck.	Yes
Striatocapsular slit-like chronic haemorrhage	Small old slit-like hypodensity in lentiform nuclei, caudate, thalami, brainstem or periventricular white matter resulting from a previous hypertensive bleed.	No
Subacute intraparenchymal haemorrhage	Subacute haematoma (4 to 21 days, usually isodense), in the cerebral hemispheres, including basal ganglia, periventricular white matter, brainstem or cerebellum. Not due to cerebral contusion or an underlying lesion.	Yes
Subacute subdural haematoma	Isodense crescent-shaped haematoma extending over the cortical surface of the brain.	Yes

CTB finding	Definition	Localisation available
Subcutaneous emphysema	Air within subcutaneous tissues usually due to fractured paranasal sinuses, ruptured larynx or trachea, penetrating injury or extension of subcutaneous emphysema from the chest.	No
Subependymal calcification or nodules	Calcification of the subependymal tissues < 1 cm. Usually calcified subependymal nodules are associated with tuberous sclerosis. Also includes non-calcified subependymal nodules due to tuberous sclerosis.	No
Sulcal effacement	Effacement, narrowing or compression of sulci due to mass effect.	No
Temporomandibular joint arthritis	Narrowing of the temporomandibular joint space and osteophyte formation or erosions.	No
Temporomandibular joint dislocation	Dislocation or subluxation of the temporomandibular joint.	Yes
Third ventricular effacement	Effacement, narrowing or compression of third ventricle due to mass effect.	No
Tonsillar herniation	Downward extension of the cerebellar tonsils through the foramen magnum due to raised intracranial pressure.	Yes
Transependymal oedema	Hypodensity along ventricular walls due to increased pressure from hydrocephalus, most commonly seen adjacent to the frontal and occipital horns of the lateral ventricles.	No
Transphenoidal surgery	Surgical resection performed through the sphenoid sinus, typically for resection of sellar or suprasellar lesions.	No
Uncal herniation	Downward herniation of the inferior medial temporal lobe through the incisura of the cerebellar tentorium.	Yes
Vascular clips	Surgical clips placed on vessels within the skull cavity. Includes aneurysmal clips. Does not include craniotomy clips or other clips outside the cranial vault.	No
Vasogenic oedema	Deep white matter hypodensity extending into subcortical white matter.	Yes
Ventricular cyst/ xanthogranulomatous change	CSF density cyst within the ventricles > 1cm diameter. Includes choroid plexus lesions such as xanthogranulomatous cysts.	Yes
Ventricular mass	Cystic/solid intraventricular mass. Includes choroid plexus lesions such as choroid plexus lipoma.	Yes

CTB finding	Definition	Localisation available
Ventriculoperitoneal (VP) shunt	Tubing extending from ventricles to the peritoneal cavity to treat hydrocephalus. Tubing typically passes through the parietal lobe into the body of the lateral ventricle.	No
Vitreous haemorrhage	Hyperattenuation in the vitreous chamber (which may be either homogeneous or heterogeneous).	Yes

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