intrasense®

INSTRUCTION FOR USE

COVID19

XP LUNG - DEDICATED PROTOCOL

COVID19 protocol – XP LUNG

1. Launch XP-Lung Covid-19 protocol

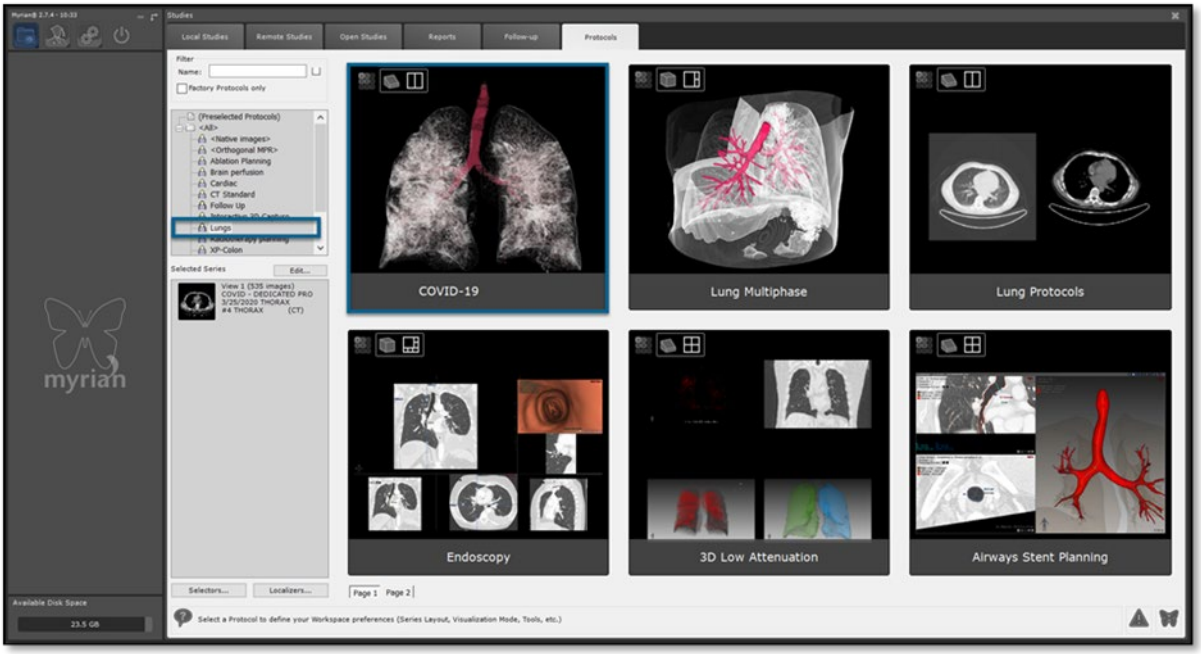
- Select series : CHEST CT

To open a chest CT select by clicking on the series .

- Open series

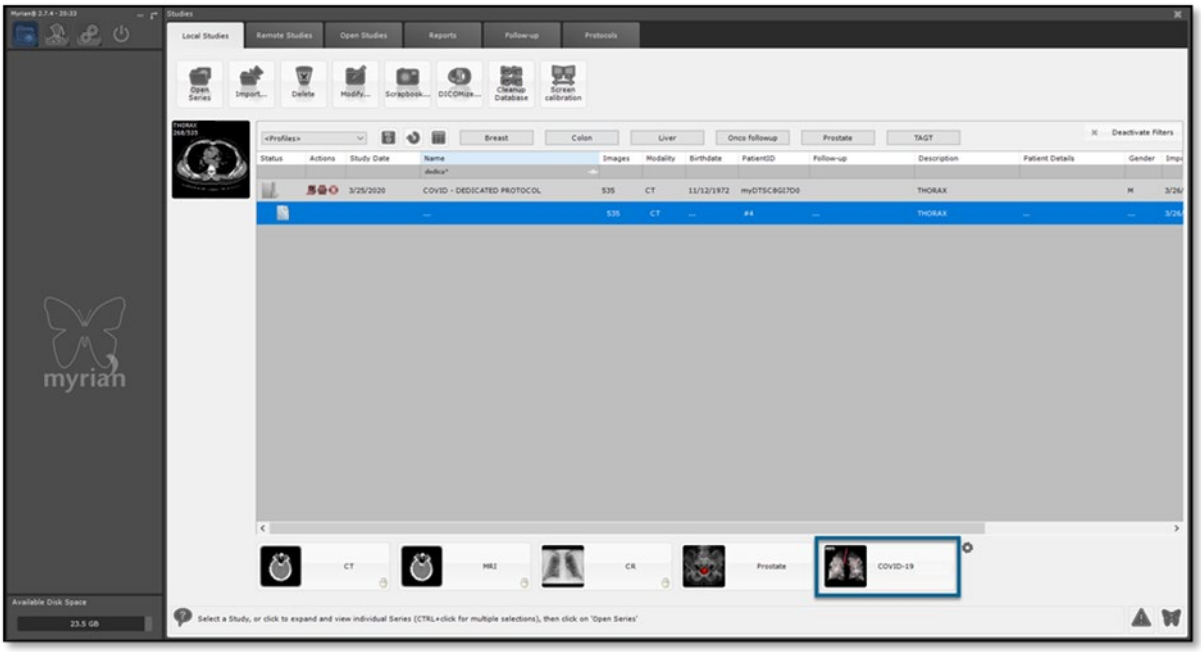
Click on open series, you will access on the protocol window.

- Method 1

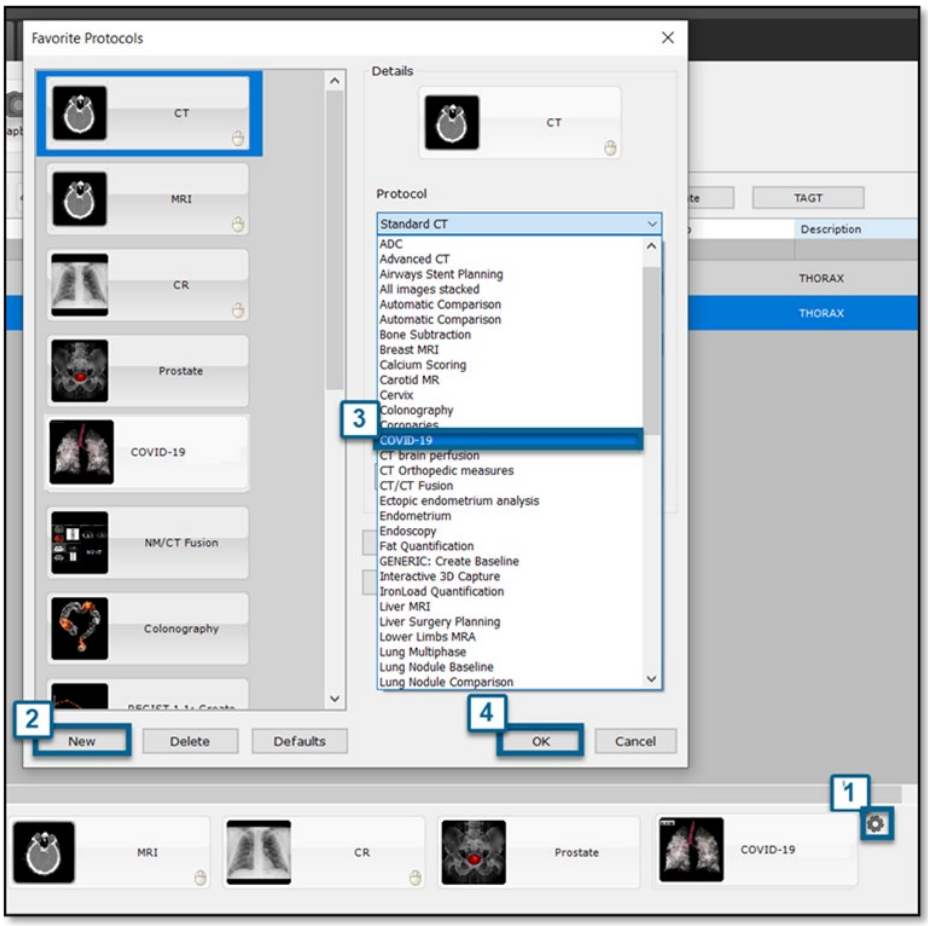


If the protocol Covid-19 appear, you just click on it. Otherwise you have to click on the protocol window and select: lungs

- Method 2



How to add a protocol in the quickprotocols?



To create a new quickprotocols:

1. **click on the wheel,**

2. **click on new**
3. **select your Covid-19 protocol**
4. **save by clicking on "OK"**

Then you will find it at the bottom of the Myrian window

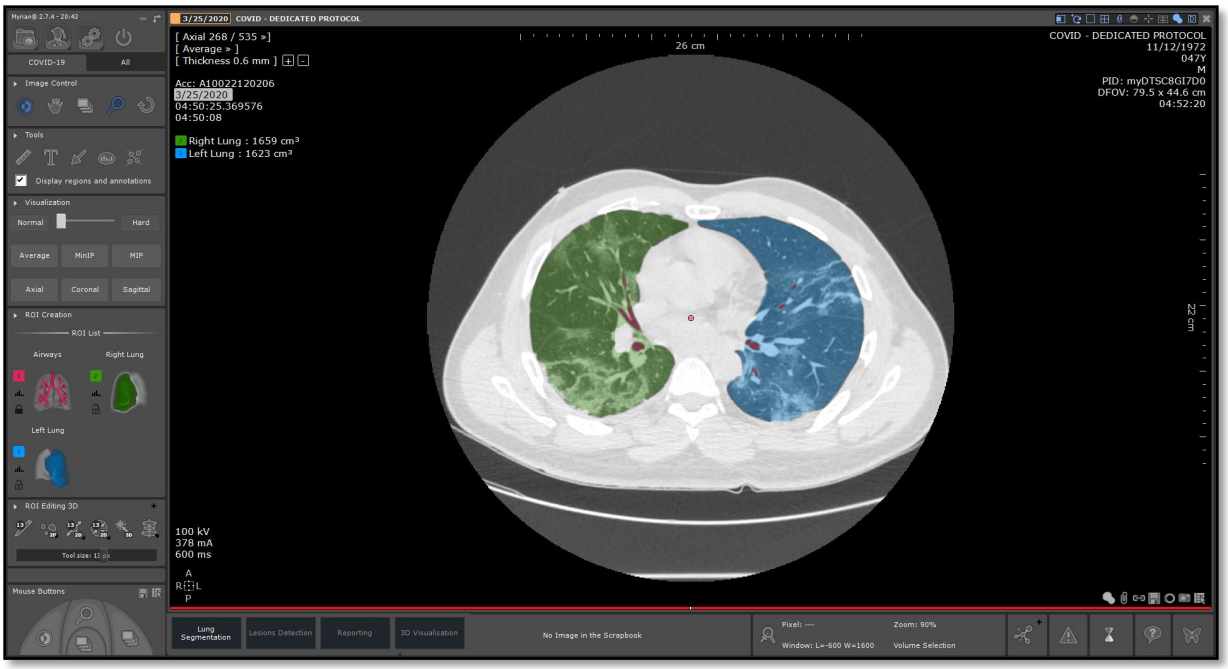
Now to open a Chest CT just select the series and click on the quickprotocols Covid-19

2. Lungs and trachea segmentation

- Automatic segmentations

Right and left lungs as well as trachea are automatically segmented at series opening.

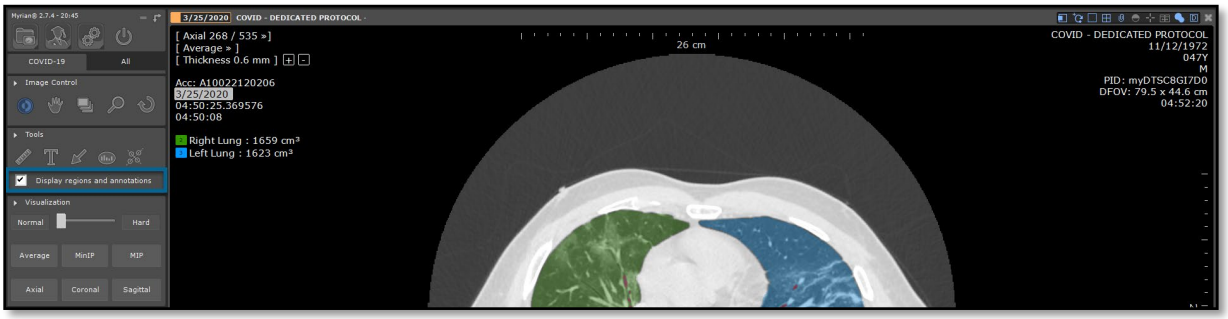
Results:



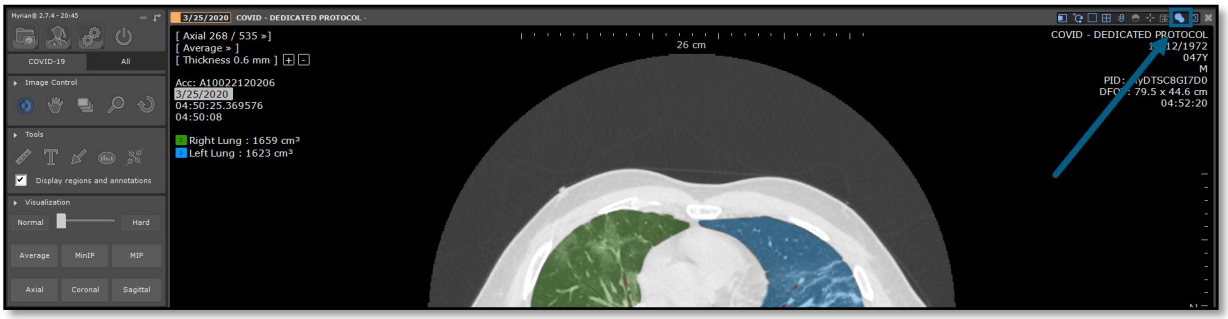
- Show/Hide ROIs

In order, to evaluate the results of segmentation, it is possible to hide/unhide the segmentation results to compare it to the native images. To screen the CT series without segmentation, two methods are available

. To hide segmentation, uncheck the box Display regions and annotations. You can screen the exam, change the orientation (axial, Sagittal, coronal), create MIP, Minip, or screen in MPR view.

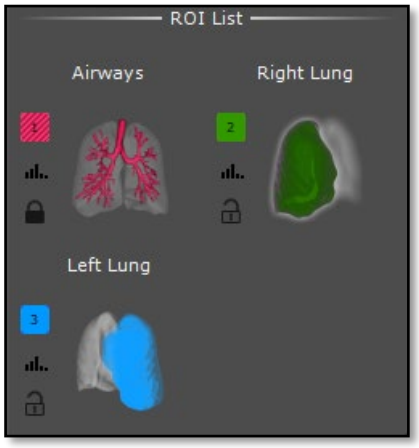


. To hide segmentation, click on the ROI coloring tool. You can screen the exam, change the orientation (axial, Sagittal, coronal), create MIP, Minip, or screen in MPR view.



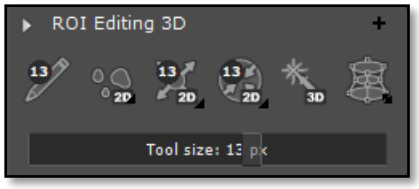
- Correction of segmentation results

. Select the ROI



To modify a segmentation, select the ROI to modify by clicking on it.

. ROI Editing 3D tools



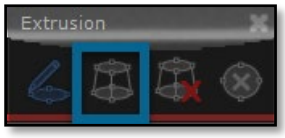
Several ROI editing tools are available in order to correct the initially obtained segmentation.

Fill a homogeneous region (semi-automatic). Select the “magic wand” tool, click on the region you need to modify, keep clicking and move the mouse. The segmentation will be improved.

Select the Extrusion tool:

. Select a region on different slices, 2 contours minimum. Click on the region you want to modify and draw the contour. Repeat it on different slices.

. Click on launch extrusion.



3. Lesions Analysis

This step allows the visualization, analysis and quantification of densities distribution in lung tissues in order to isolate lung lesions from healthy tissues.

- Adjust the thresholds with the sliders

Thresholds are used in order to isolate specific structures in the lung tissues according to their densities. Each isolated structure is colored in specific overlay in the native images.

. First slider moved is to threshold the Hazy densities.

. Second slider moved is to threshold the dense opacities.

WARNING: Dense opacities volume could include a part of vascular volume as both structures have similar intensities. Please check carefully the results of the threshold on the native images.

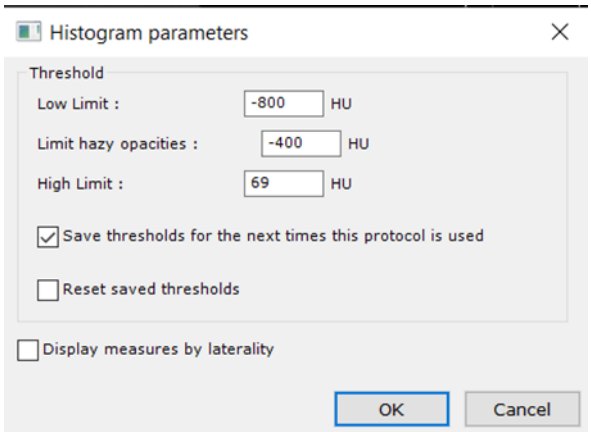
. Third slider moved is to threshold the vascularization.

WARNING: Vascularization volume could include a part of dense opacities volume as both structures have similar intensities. Please check carefully the results of the threshold on the native images.

The histogram representation: x axis is representing the Hounsfield unity; the y axis is representing the pixel quantity.

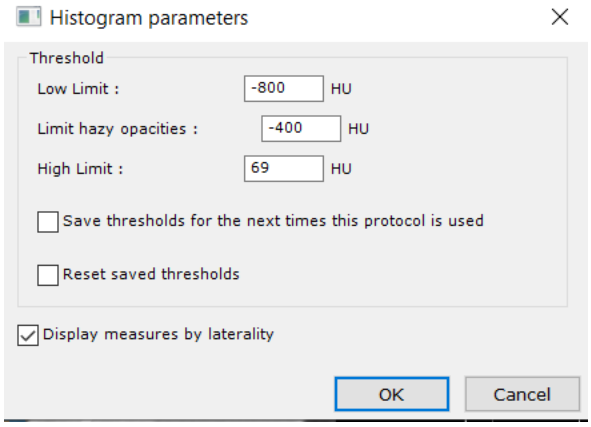
It's possible to insert manually the threshold values.

- Histogram available parameters



Check the box to save threshold for the next time, it will save those thresholds for next studies.

You can also reset saved threshold by checking the box.



Check the box to display measures by laterality right and left

When moving sliders, real time colorization is done. In orange the hazy opacities, in red the dense opacities, in white the vascular tree.

- Volume visualization

Volumes displayed in the histogram are updated according to the different thresholds selected.

☐ Display measures by laterality

	<Right Lung> + <Left Lung>	
Low Densities (< -800 HU)	2066.9 cm3 (64.7 %)	Lungs volume
Hazy opacities ([-800, -400[HU)	961.8 cm3 (30.1 %)	Hazy opacities volume
Dense opacities ([-400, 61] HU)	163.1 cm3 (5.1 %)	Dense opacities and part of vascular volume

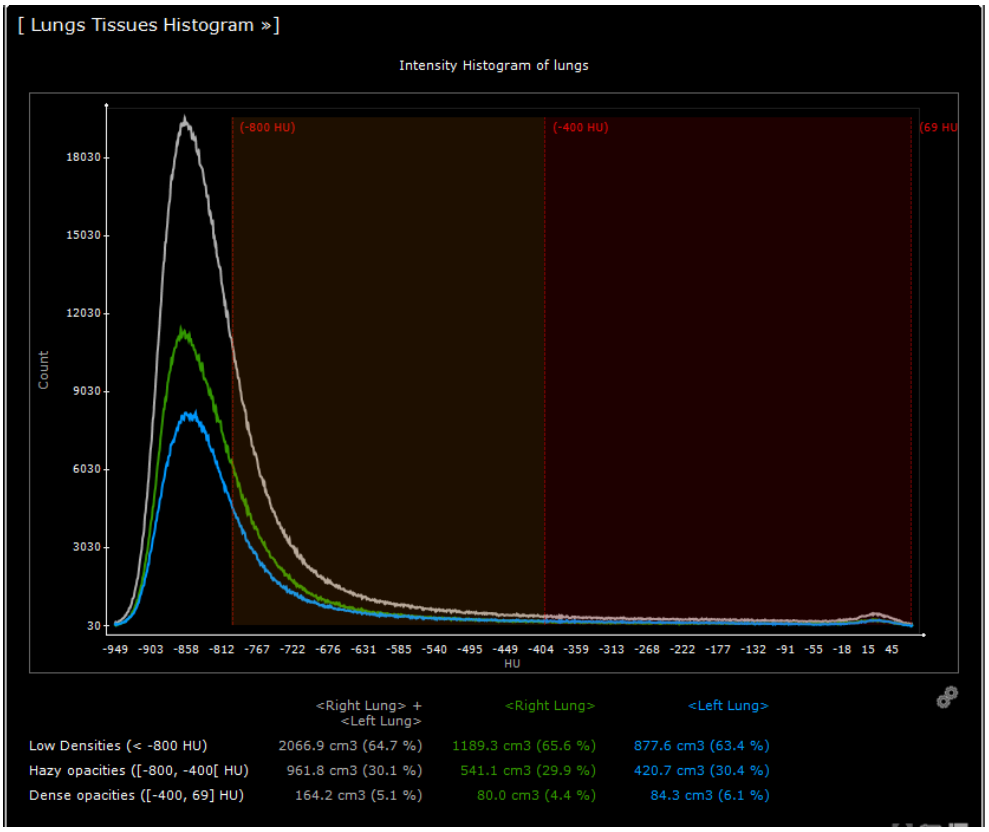
If the display measures by laterality box is uncheck you can read the global volume and percent in both lungs

☑ Display measures by laterality

	<Right Lung> + <Left Lung>	<Right Lung>	<Left Lung>
Low Densities (< -800 HU)	2066.9 cm3 (64.7 %)	1189.3 cm3 (65.6 %)	877.6 cm3 (63.4 %)
Hazy opacities ([-800, -400[HU)	961.8 cm3 (30.1 %)	541.1 cm3 (29.9 %)	420.7 cm3 (30.4 %)
Dense opacities ([-400, 69] HU)	164.2 cm3 (5.1 %)	80.0 cm3 (4.4 %)	84.3 cm3 (6.1 %)

If checking the display measures by laterality box you can read the different volumes and percent in right and left lungs.

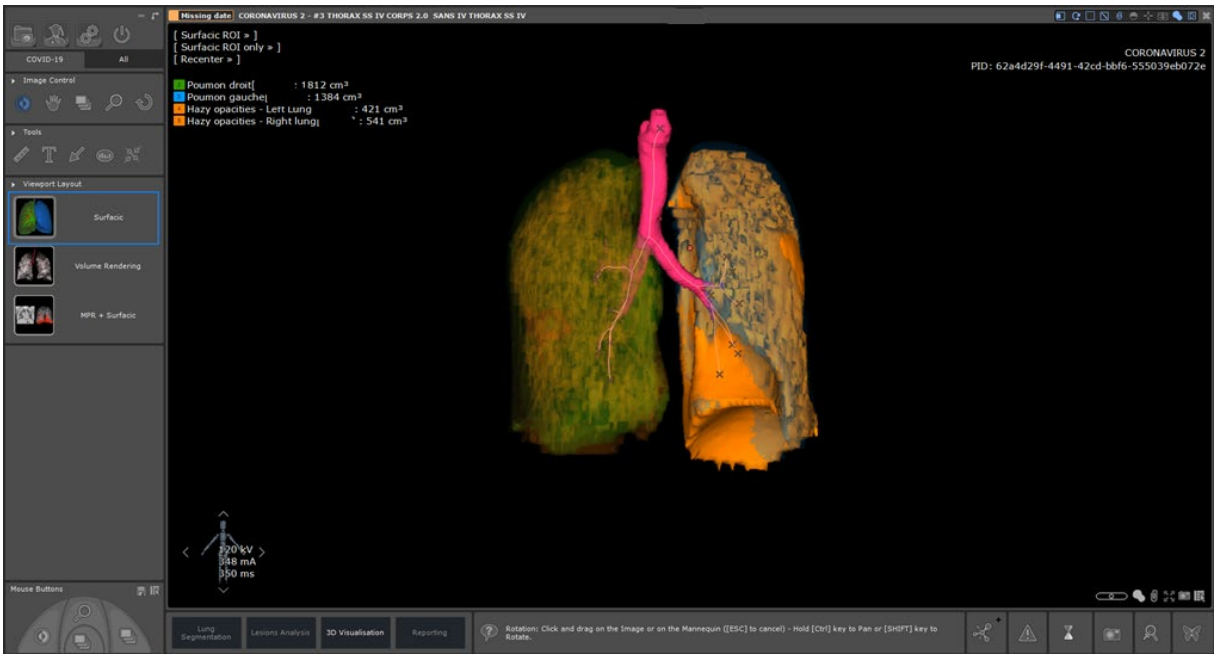
You have the curves in the histogram for all the different volumes, global for both lung (white), right lung (green) and left lung (blue).



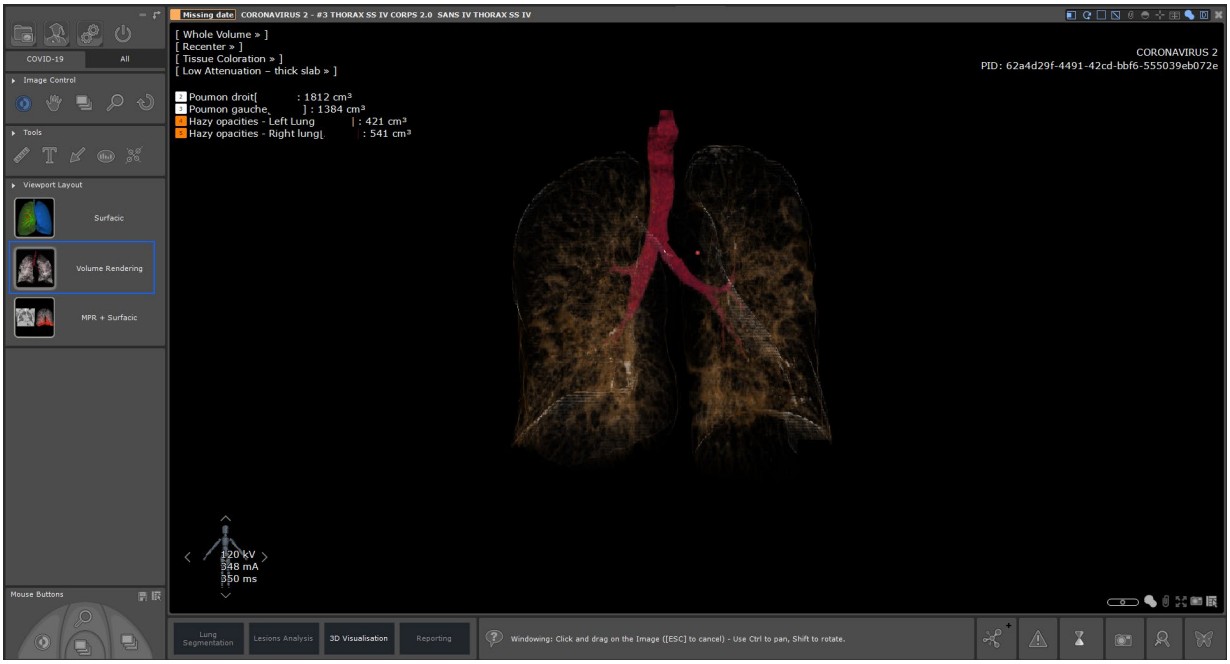
4. 3D visualzation

This step allows you to visualize the CT series in 3D with different preset

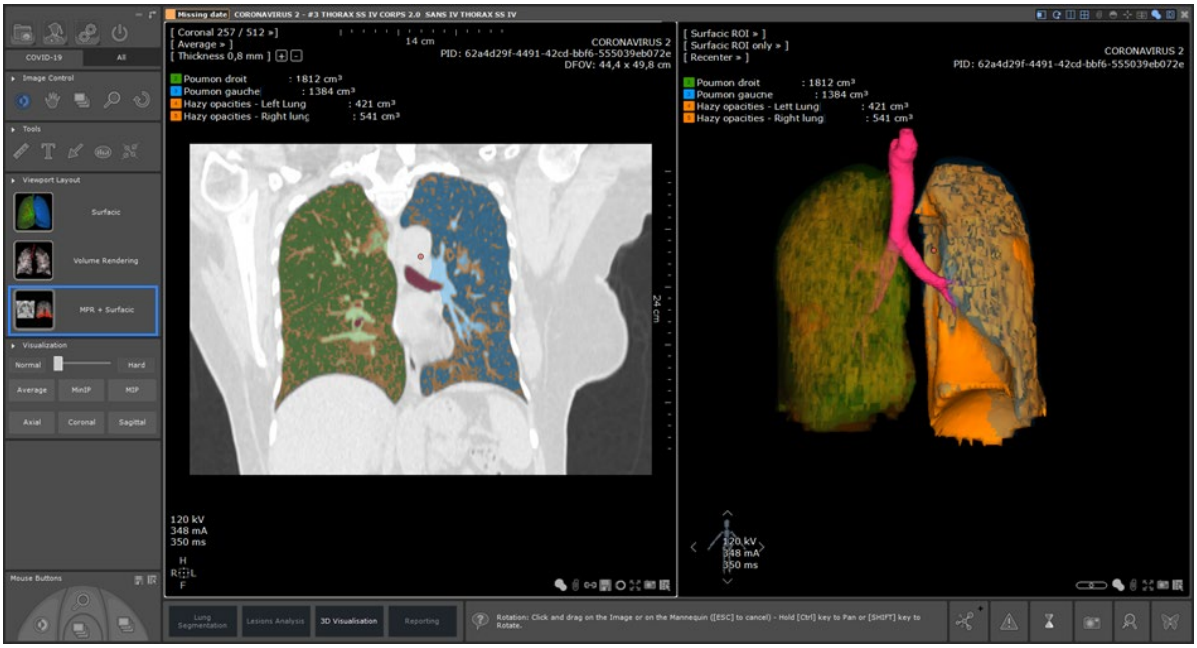
- Surfacic



- Volume Rendering

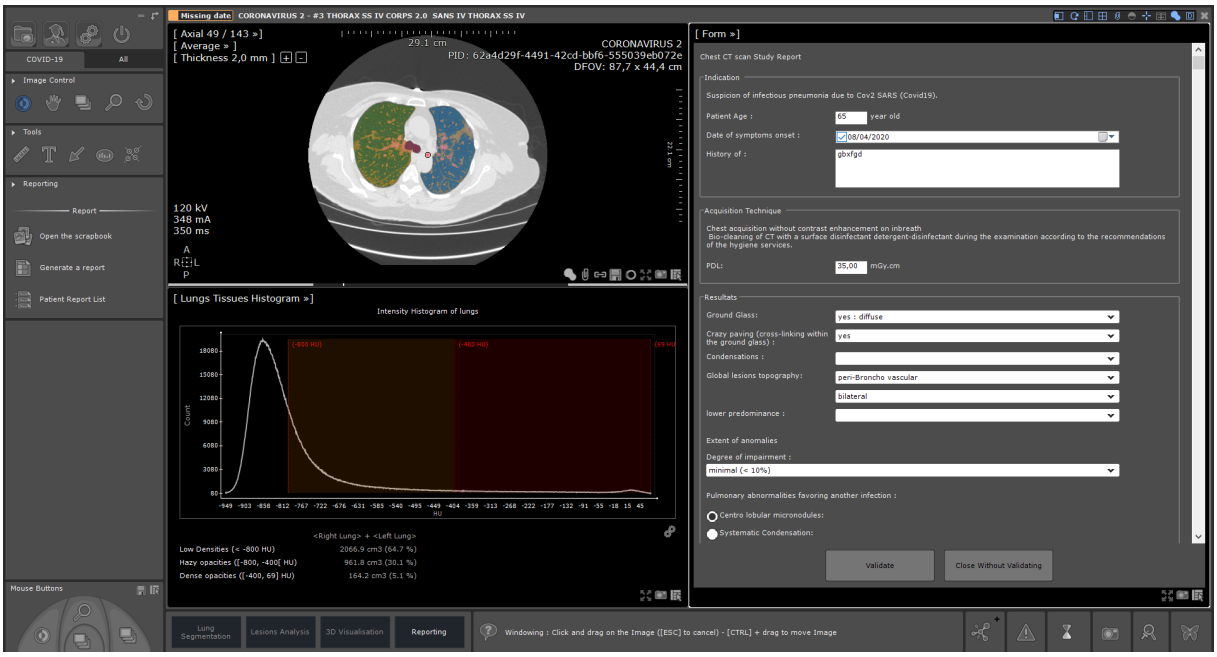


- MPR + surfacic



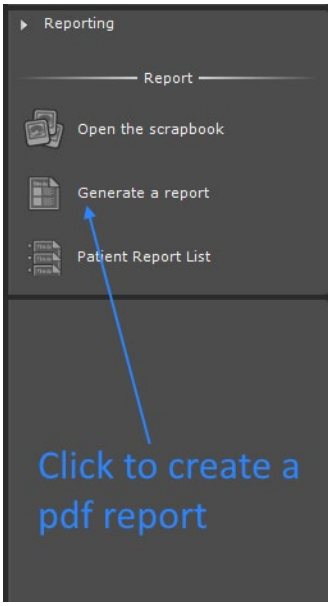
5. Reporting

This step allows you to create a report.

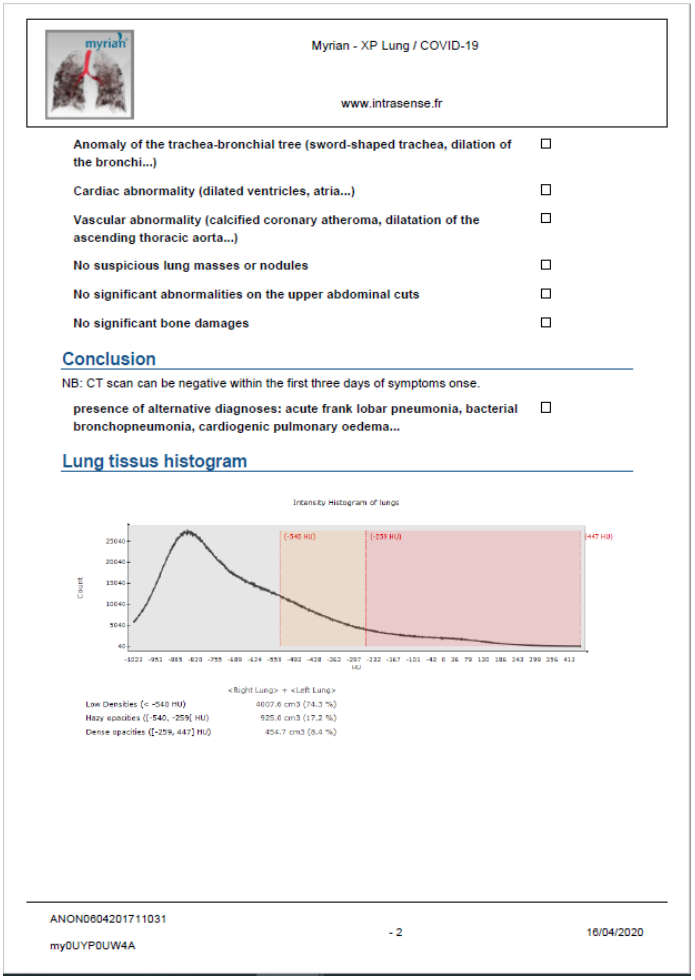


You can fill the information, check predefined boxes to create a COVID-19 report.

- PDF report creation



By clicking on generate a report, a pdf report is open, you can print it, export it.



Myrian - XP Lung / COVID-19

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Anomaly of the trachea-bronchial tree (sword-shaped trachea, dilation of the bronchi...) ☐

Cardiac abnormality (dilated ventricles, atria...) ☐

Vascular abnormality (calcified coronary atheroma, dilatation of the ascending thoracic aorta...) ☐

No suspicious lung masses or nodules ☐

No significant abnormalities on the upper abdominal cuts ☐

No significant bone damages ☐

Conclusion

NB: CT scan can be negative within the first three days of symptoms onse.

presence of alternative diagnoses: acute frank lobar pneumonia, bacterial bronchopneumonia, cardiogenic pulmonary oedema... ☐

Lung tissus histogram

Intensity Histogram of lungs

<Right Lung> + <Left Lung>

Low Densities (< -540 HU)	4007.6 cm3 (74.3 %)
Hazy opacities ([-540, -259[HU)	925.6 cm3 (17.2 %)
Dense opacities ([-259, 447] HU)	454.7 cm3 (8.4 %)

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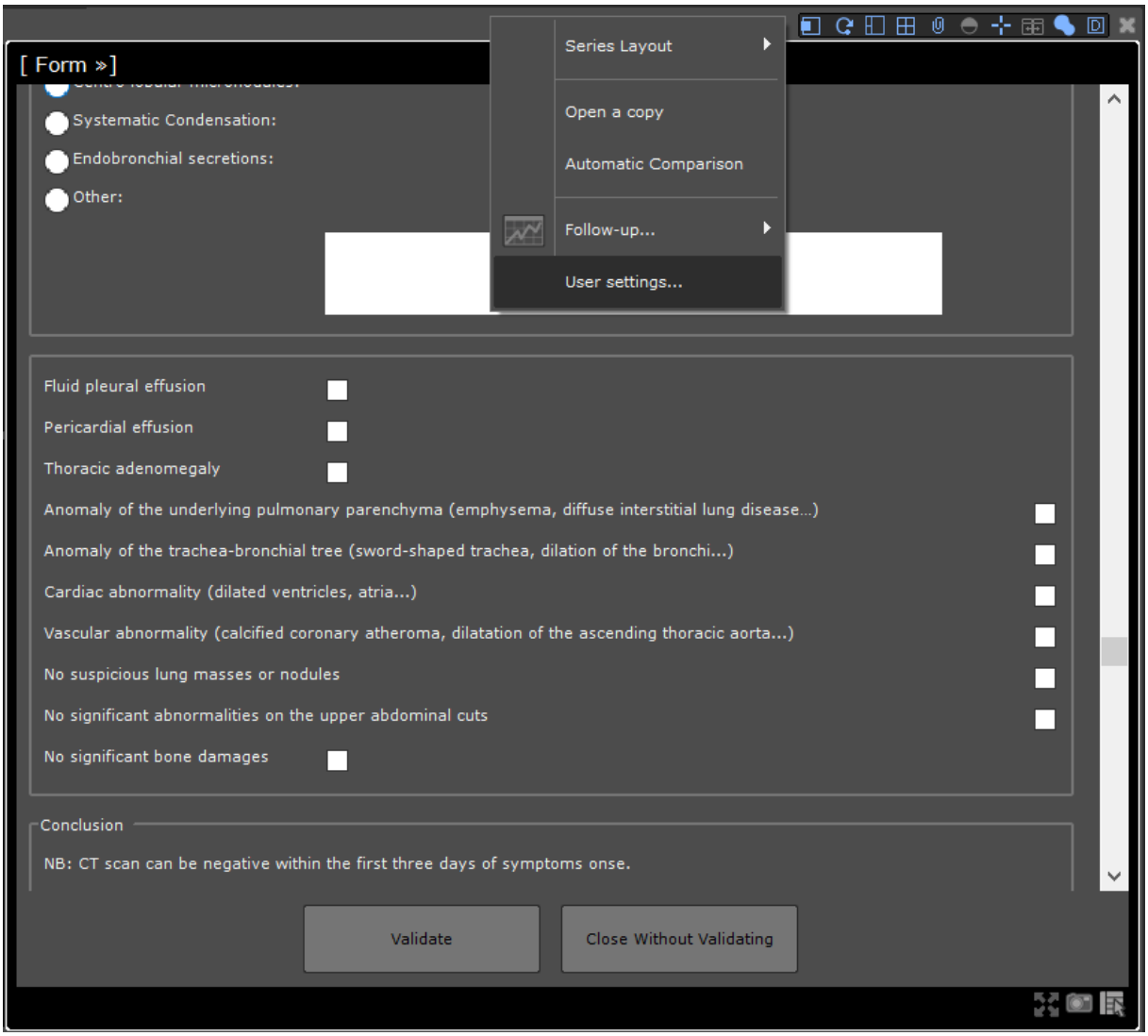
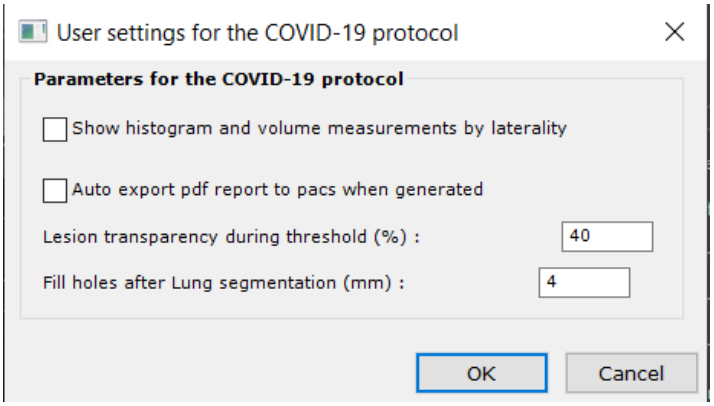
The histogram is automatically insert in the report



You can automatically export the report to your PACS. Right click, on the top of the report viewport, select user settings, this window will appear.



Check the box auto export pdf report to PACS when generated. Click “OK”

Now when you generate a report and validate, when closing, the report will be automatically export to your PACS.

6. Closing study

Click on validate to save report and close the study.