Supplemental Material:

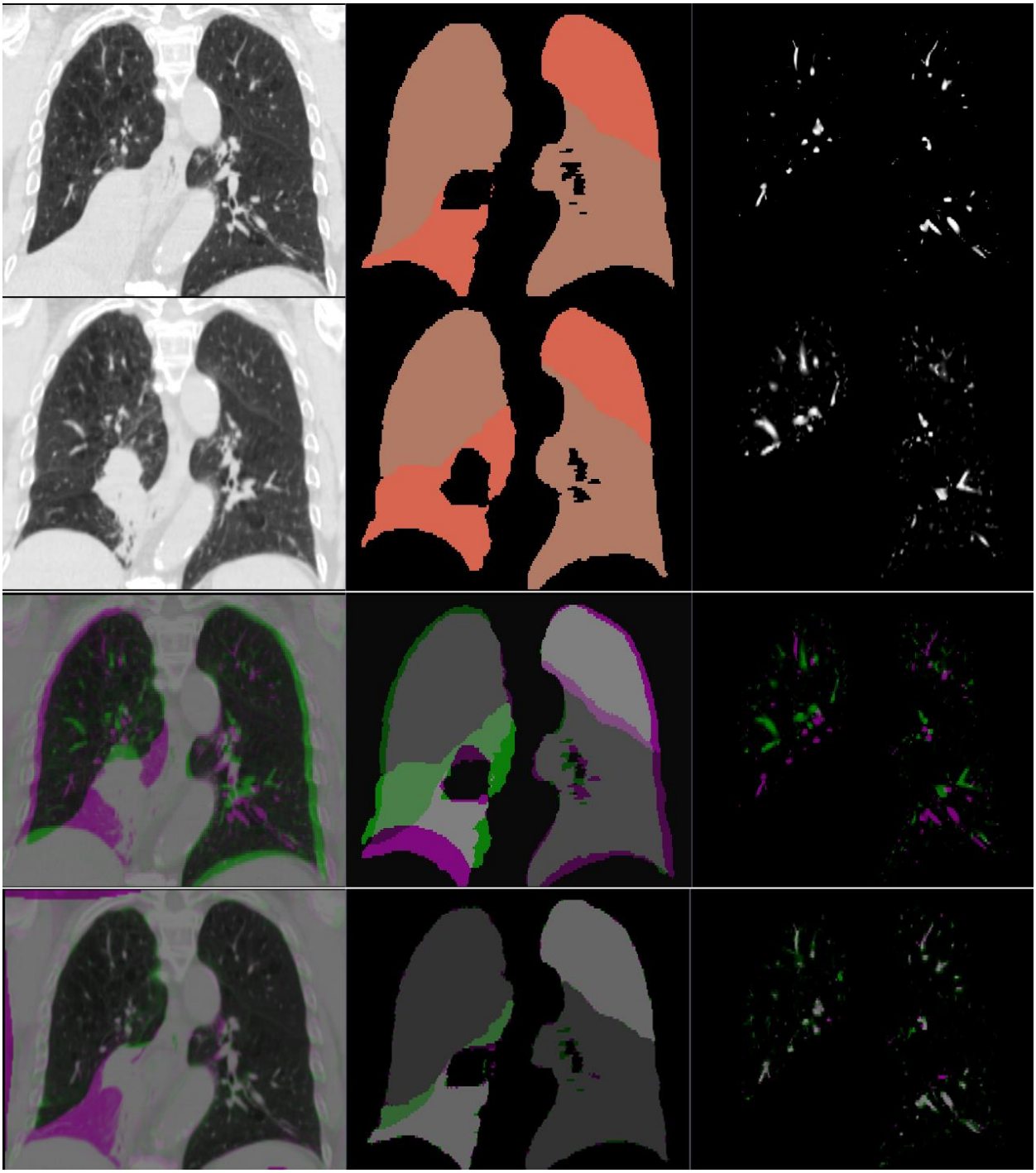
First figure for each patient:

Input data and registration results for all patients are shown for the baseline scan set as the fixed image of the registration (first row) and the mid-treatment scan set as the moving image of the registration (second row). The CT scans are shown in the left column, the lobe label images are shown in the middle column, and the vesselness measure images are shown in the right column. For the lobe label images, red voxels have a value of 5, green voxels have a value of 3, and brown voxels have a value of 1. Complementary color overlays of the fixed (magenta) and moving (green) images are provided to illustrate the degree of initial misalignment due to differences in lung volume and changes in pathology (third row) and to show the resulting alignment of all three datasets after registration via the best permutation of the CALIPER algorithm (fourth row).

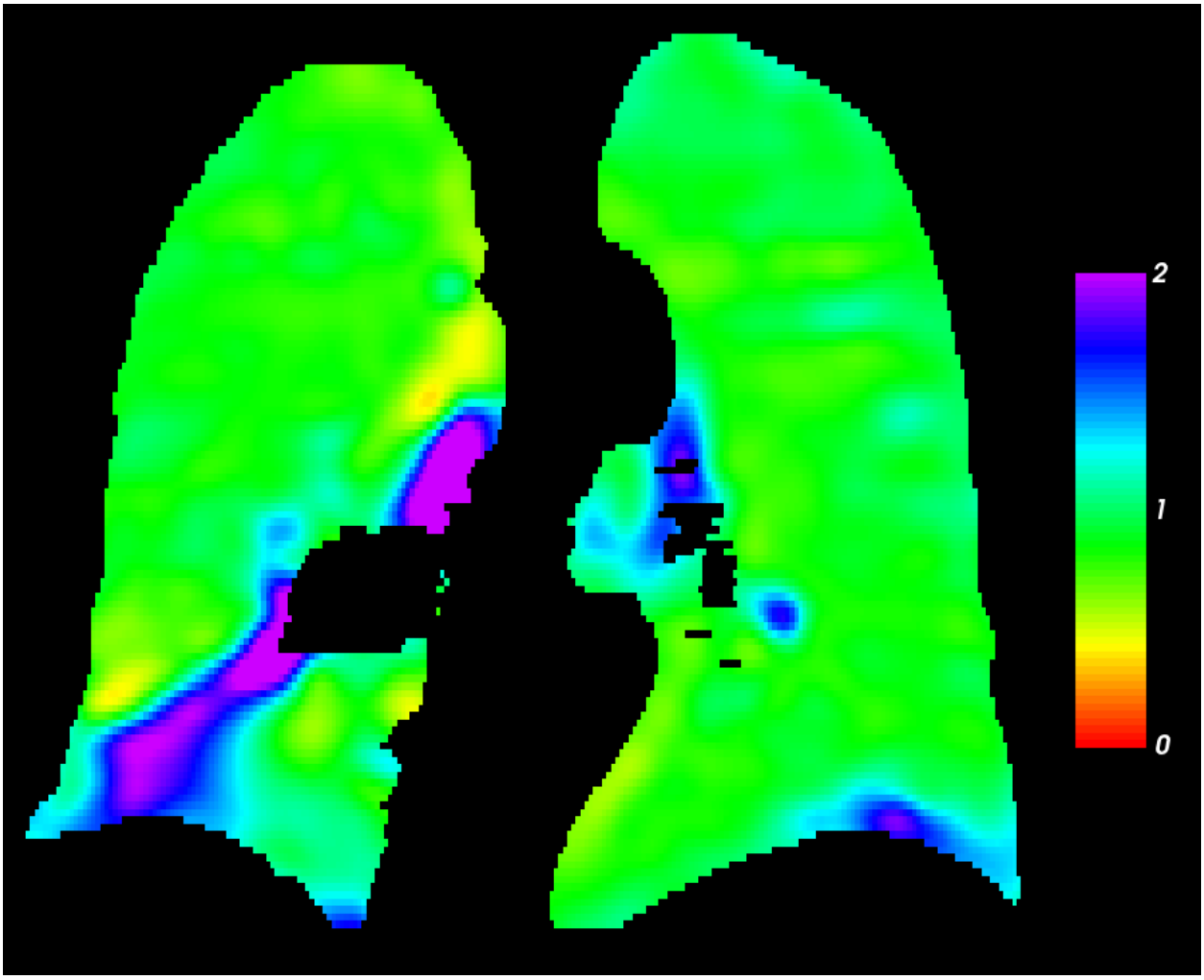
Second figure for each patient:

The spatial Jacobian image of the transformation from the best registration result is shown. The same registration results and coronal slice are used as in the first figure. Values greater than 1 (blue end of spectrum) indicate local expansion of volume; values less than 1 (red end of spectrum) correspond with volume compression; and values less than 0 signify non-physical deformation (folding of space).

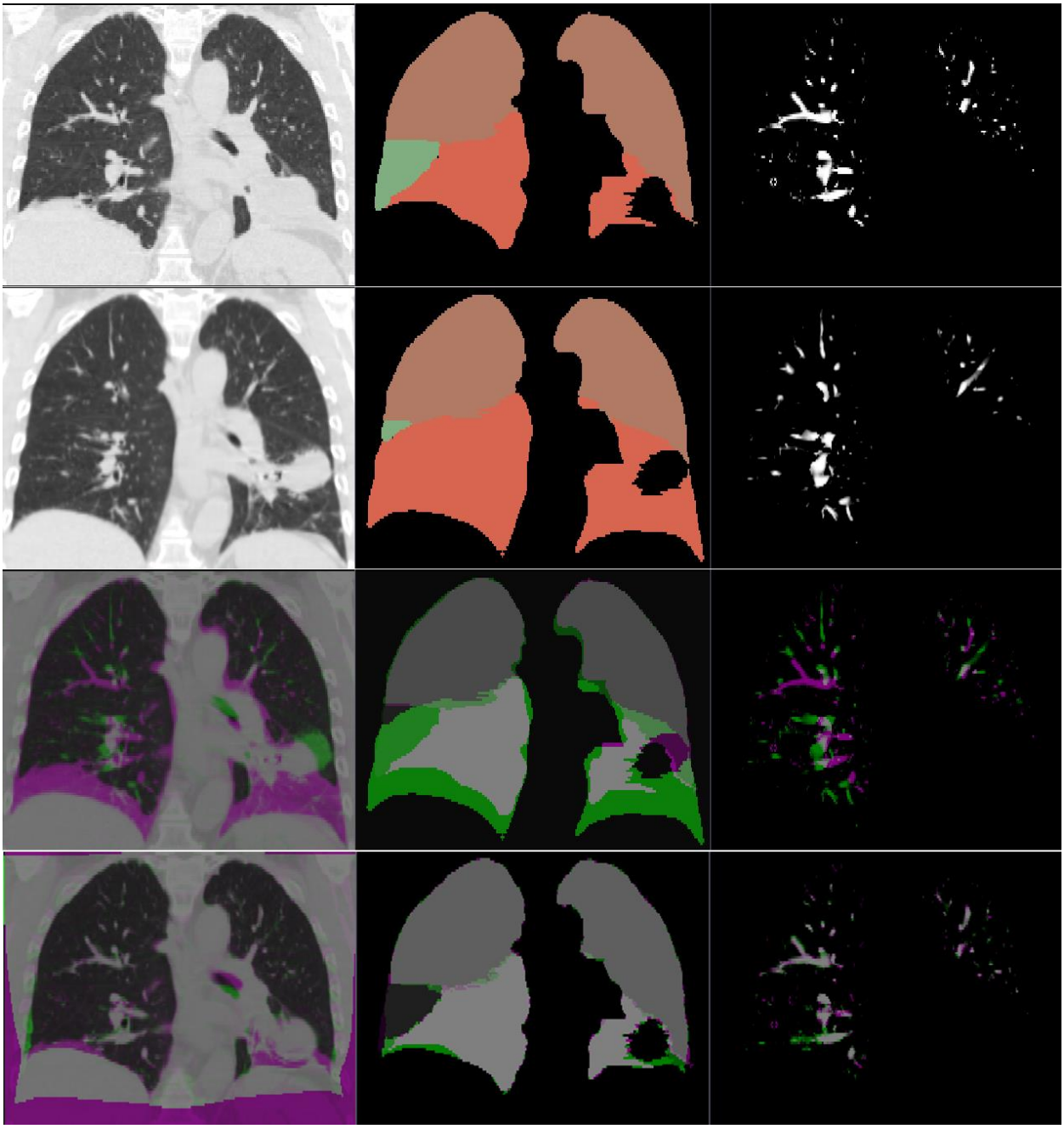
Patient 1



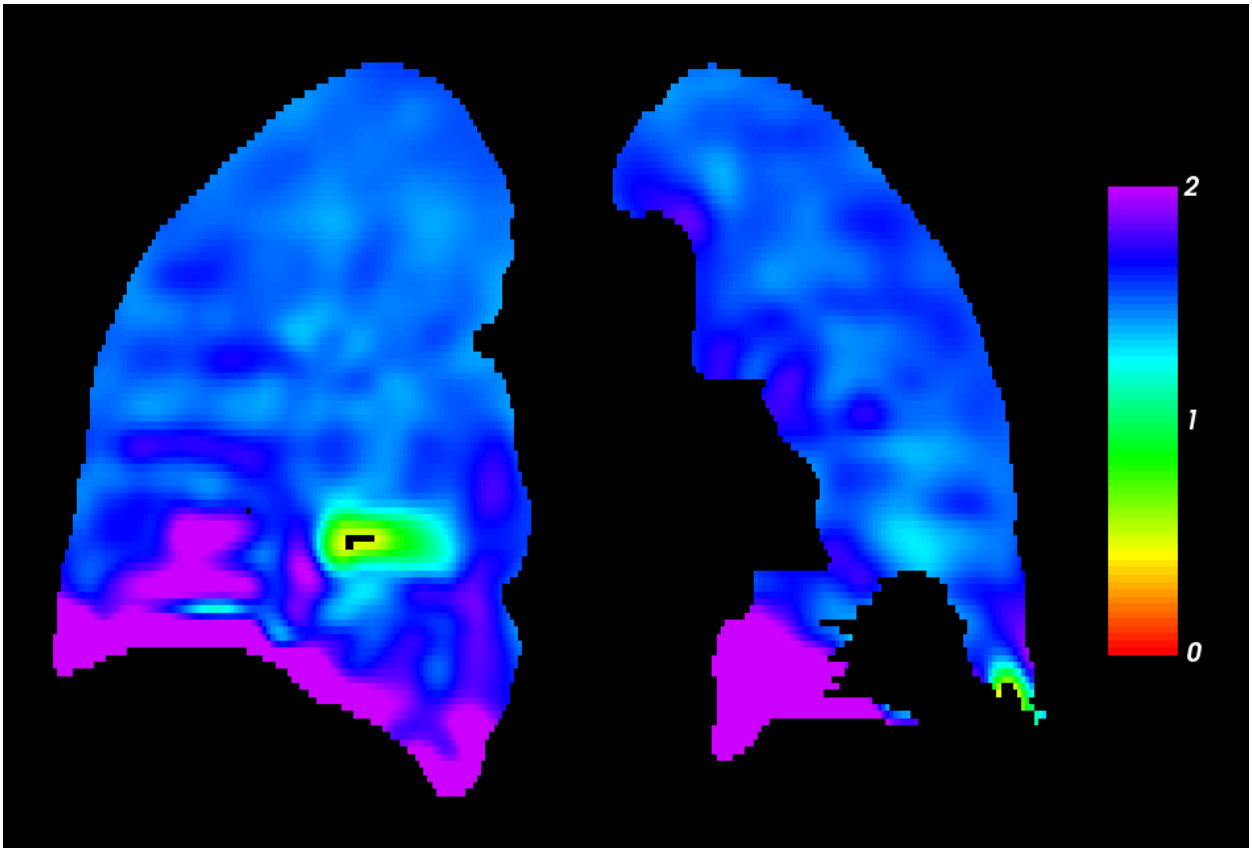
Patient 1



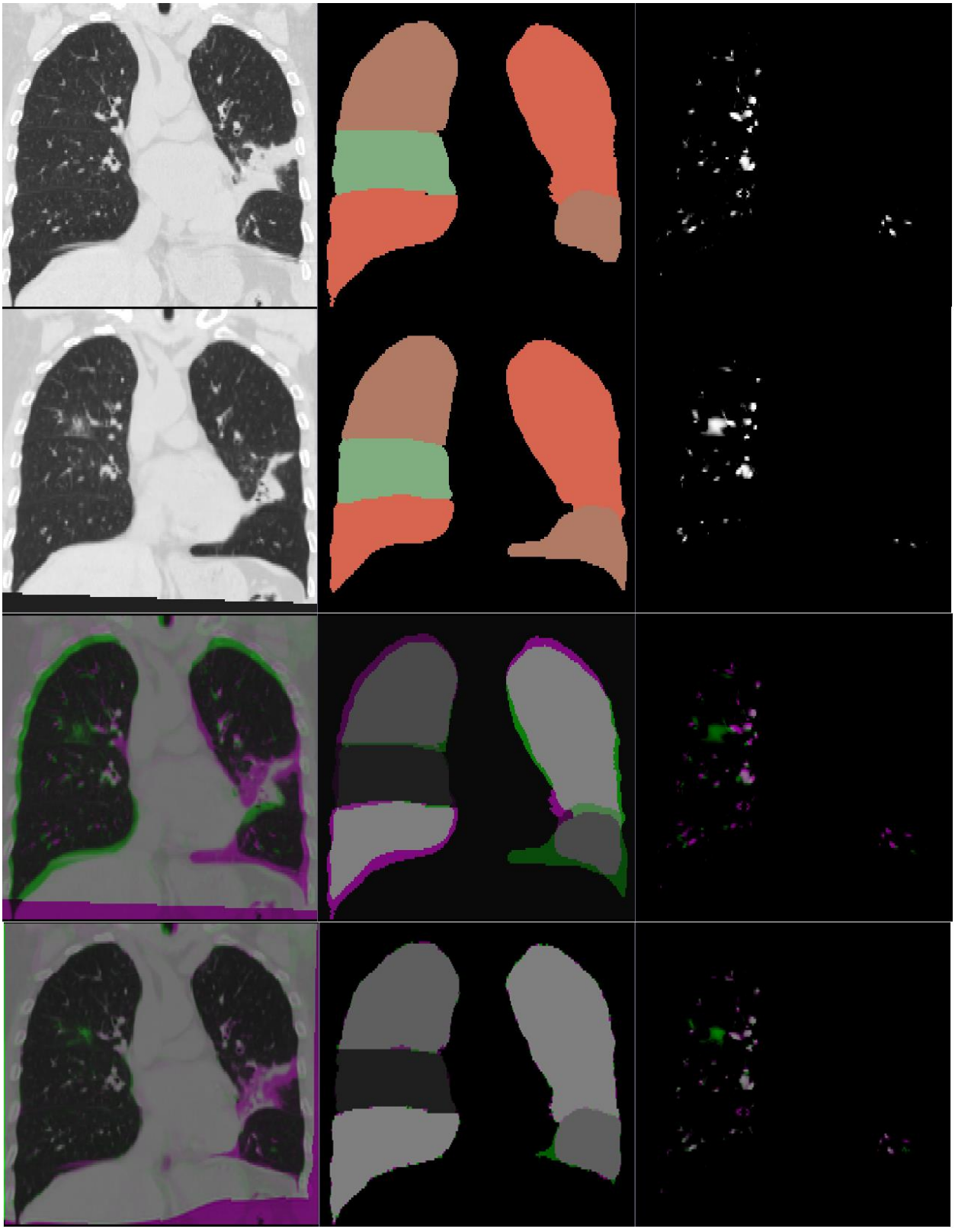
Patient 2



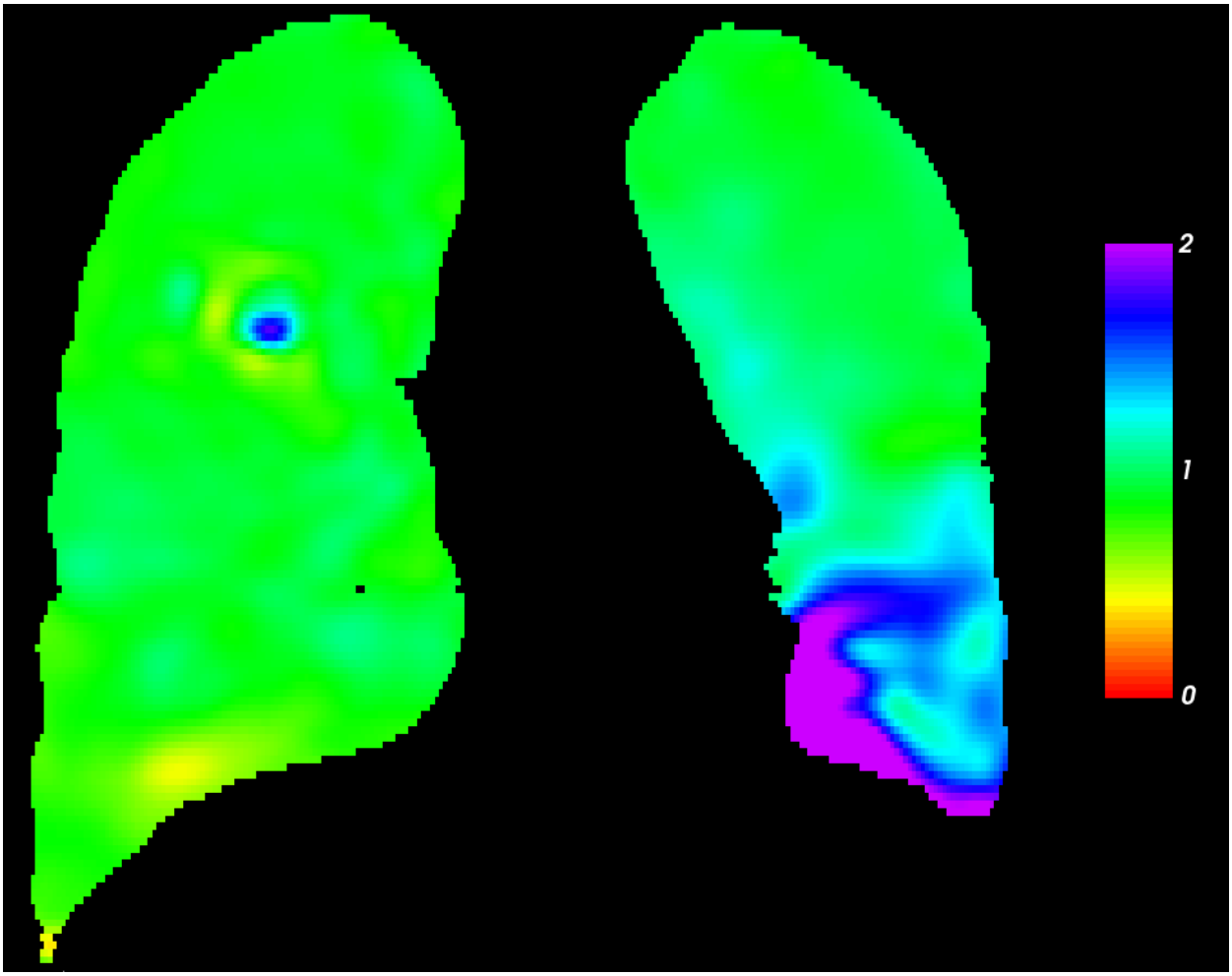
Patient 2



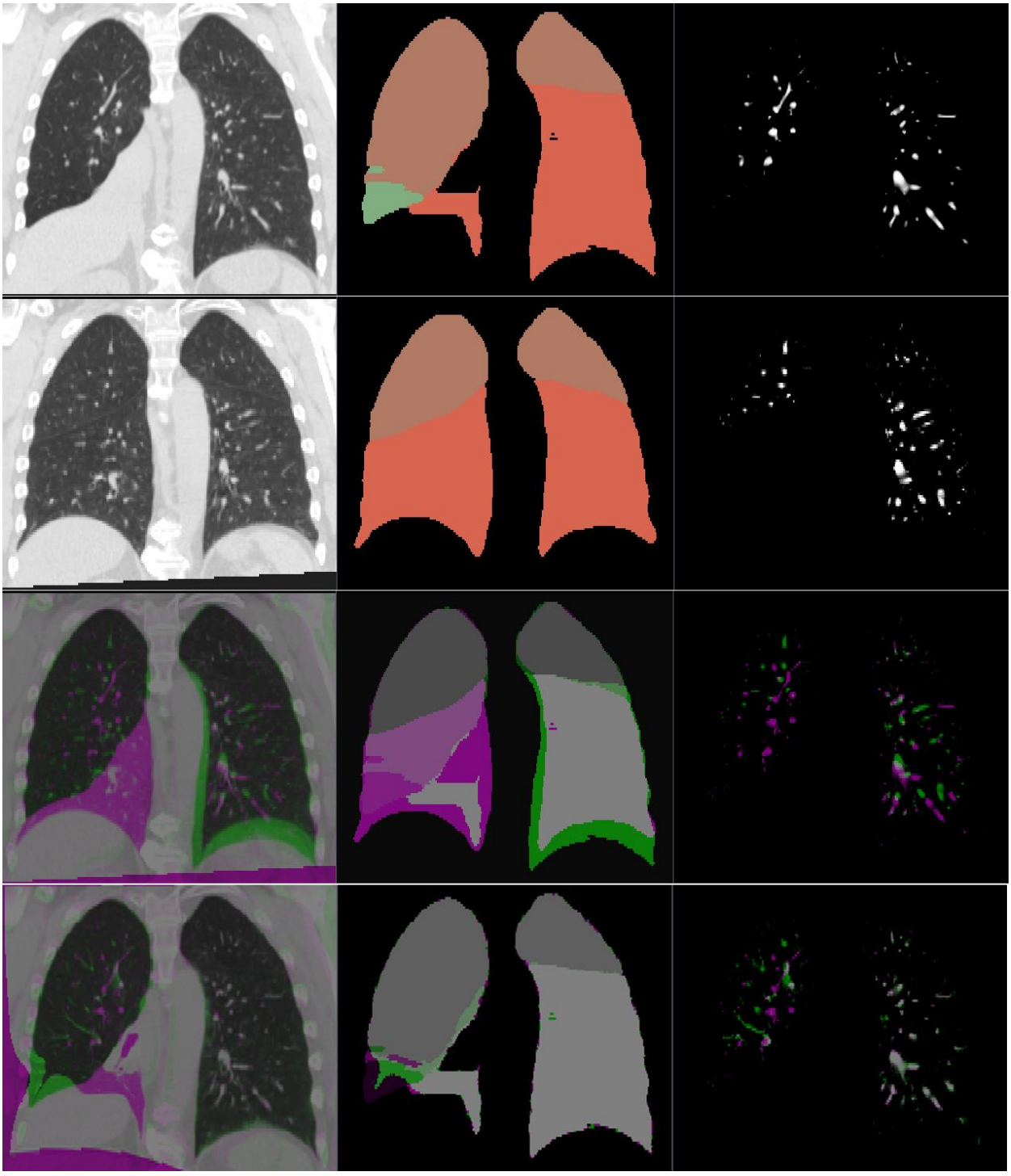
Patient 3



Patient 3

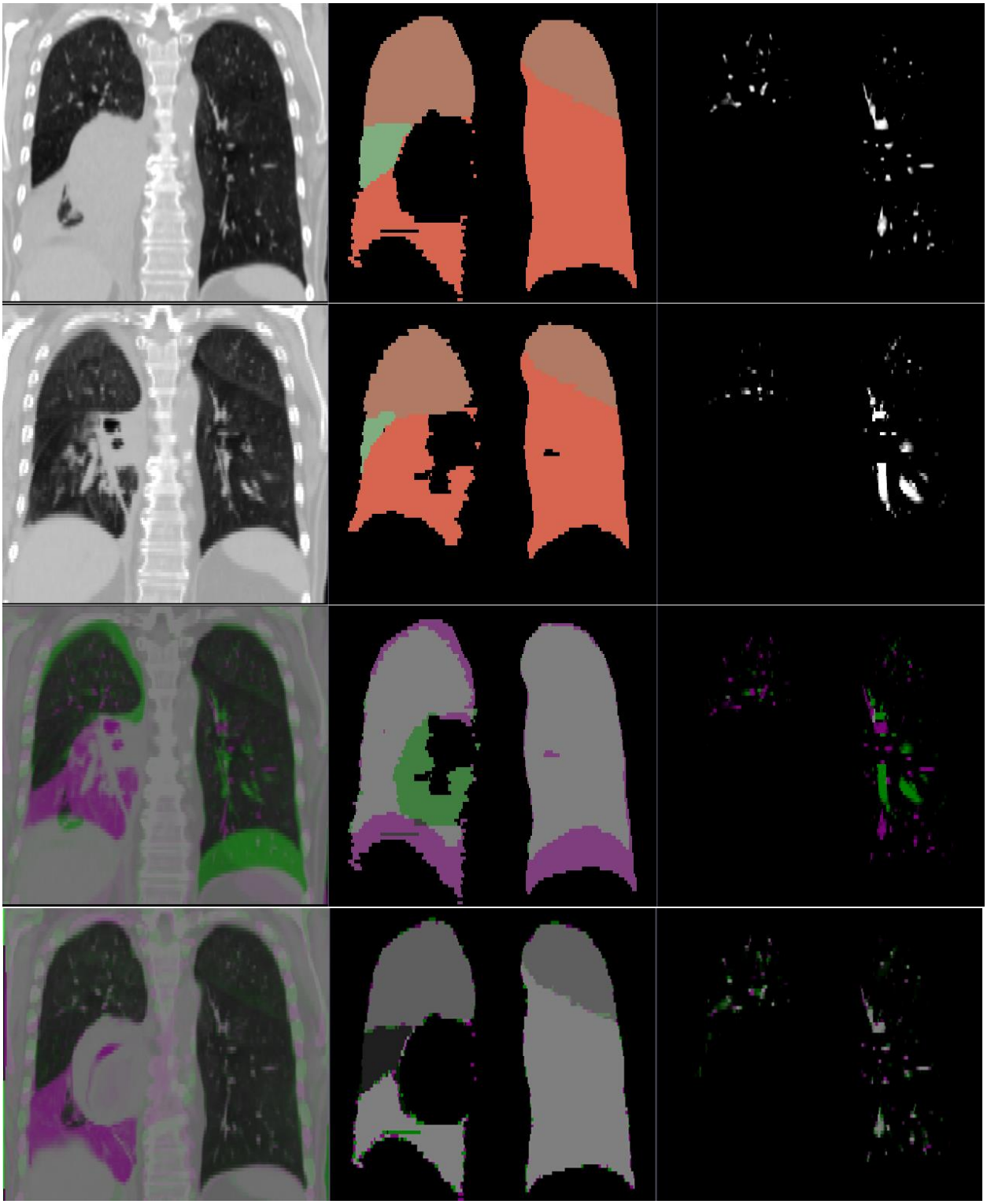


Patient 4

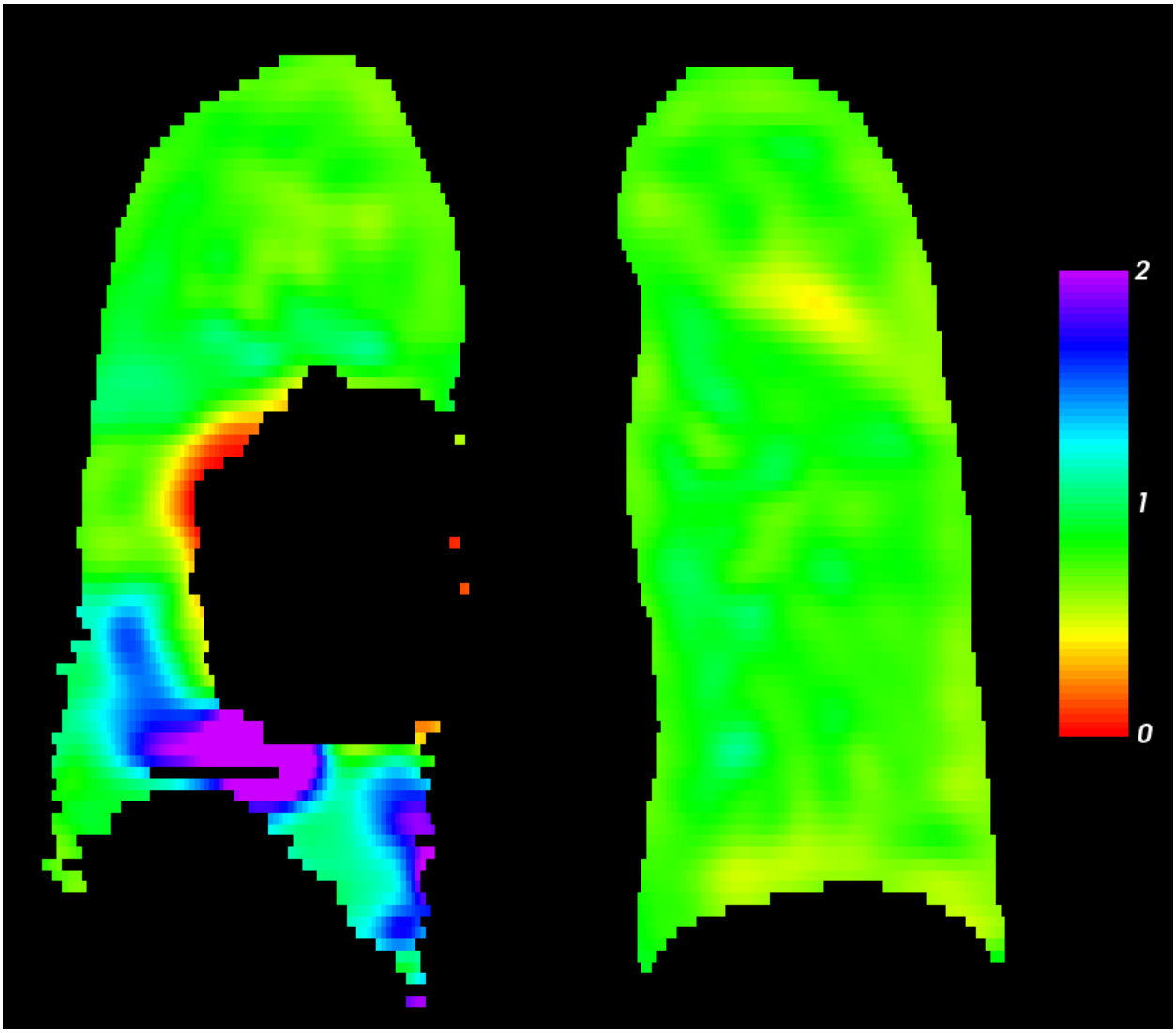


Patient 4

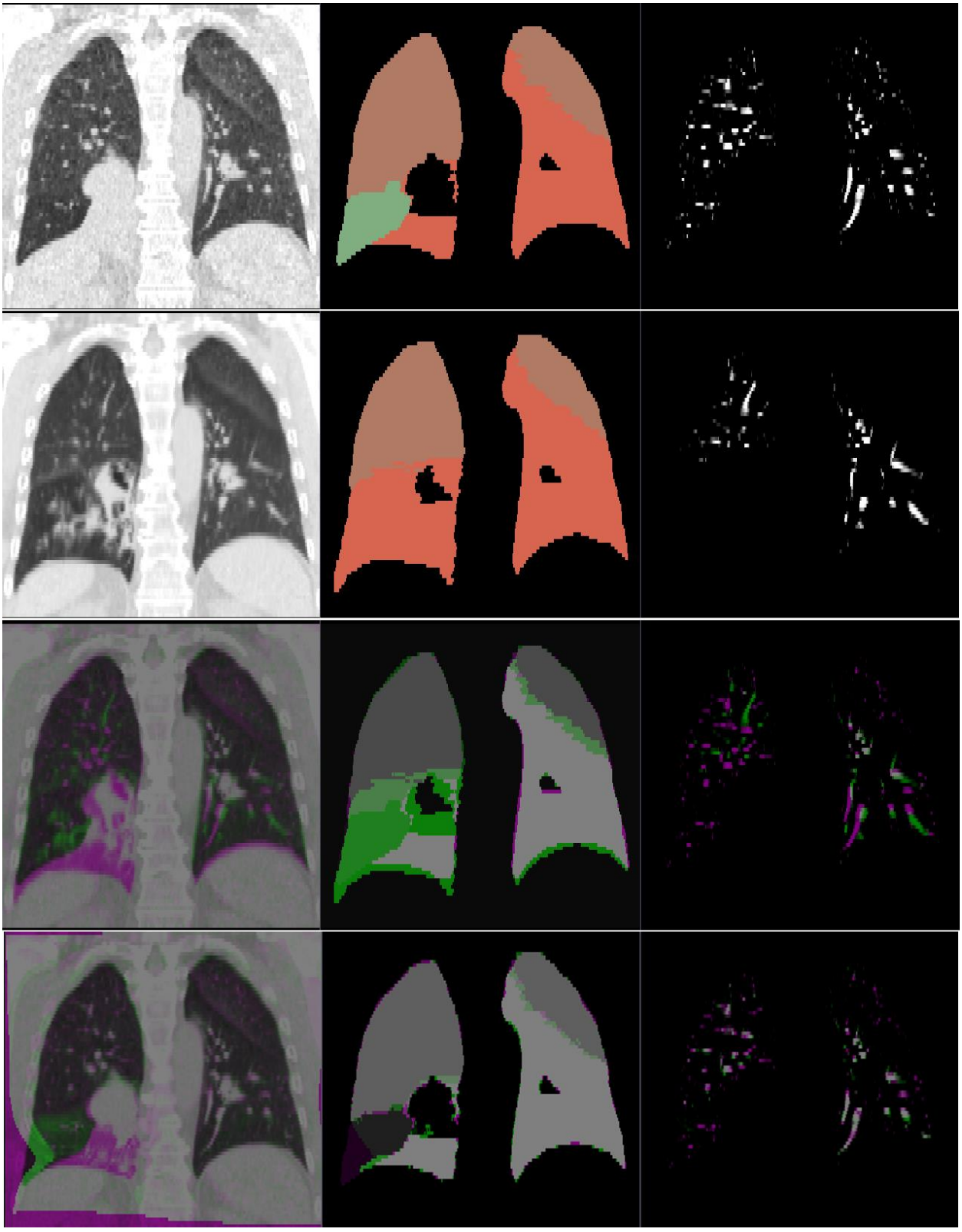
Patient 5



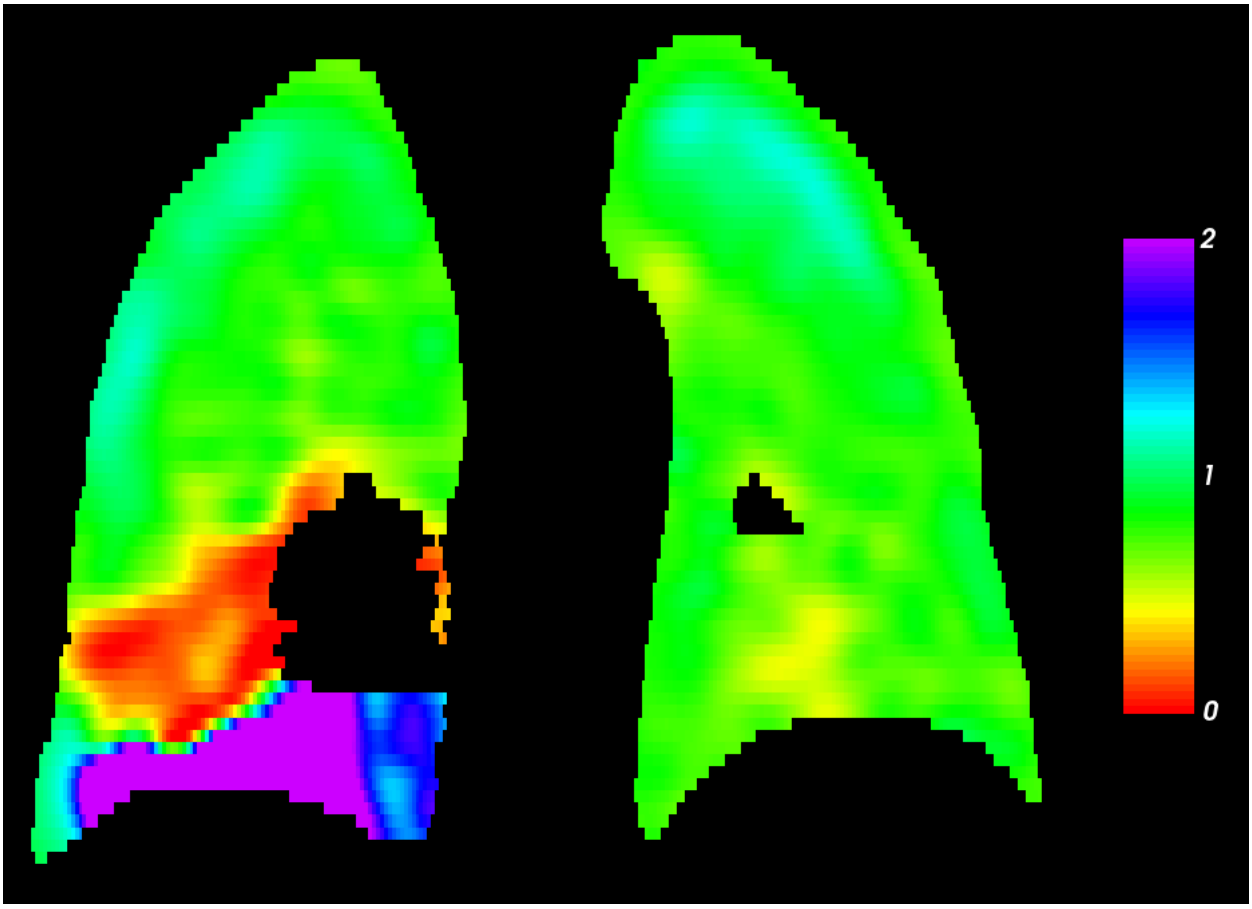
Patient 5



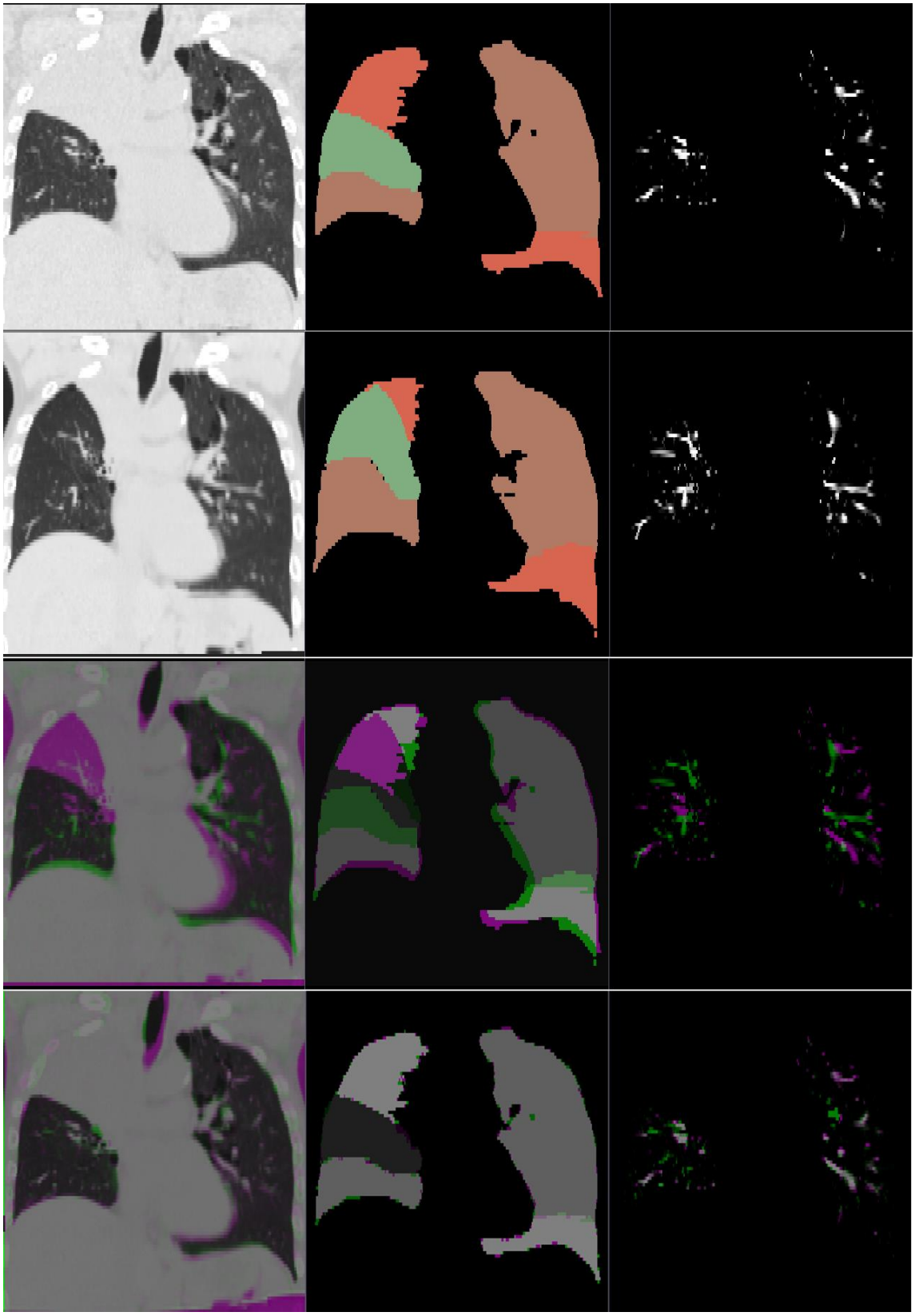
Patient 6



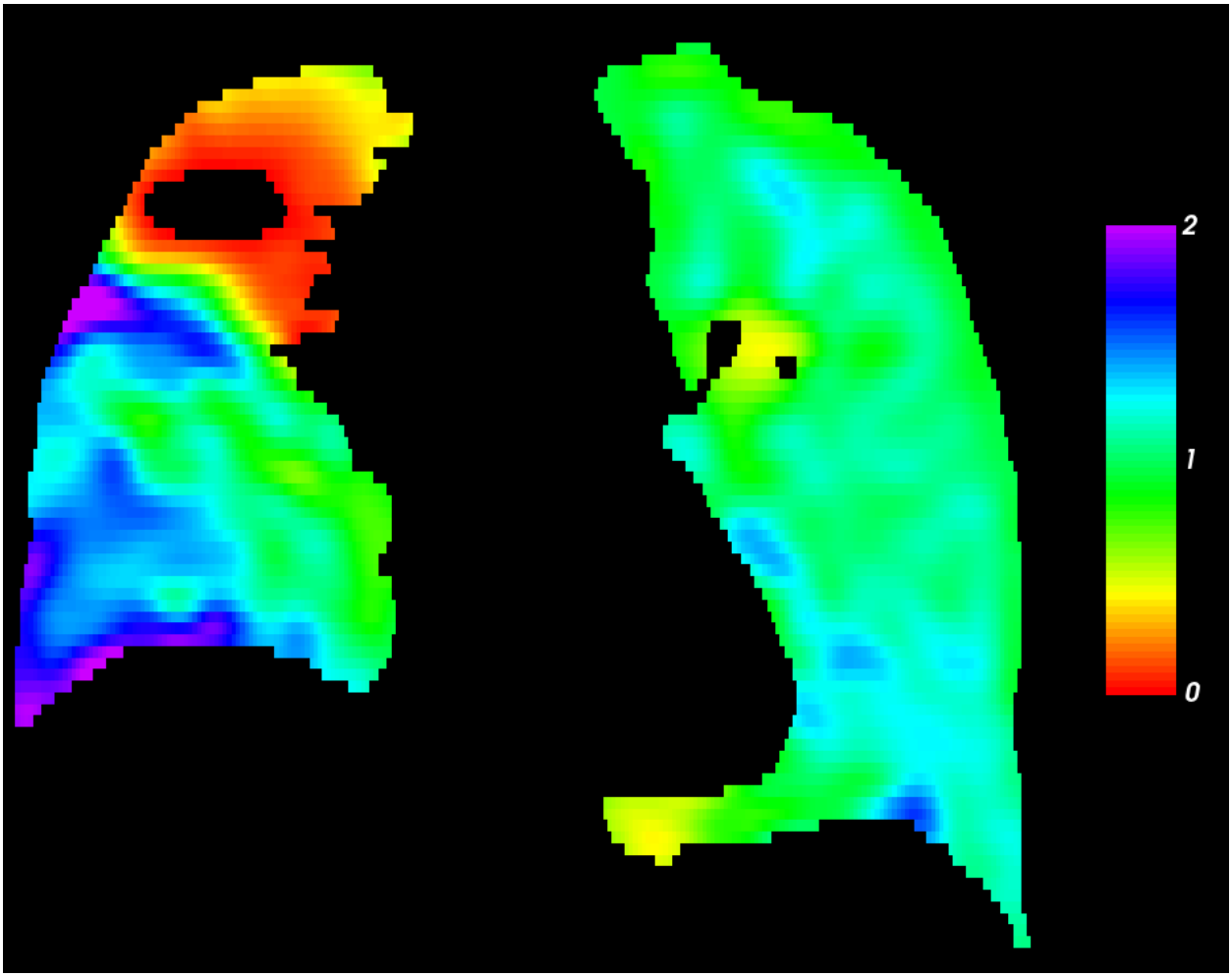
Patient 6



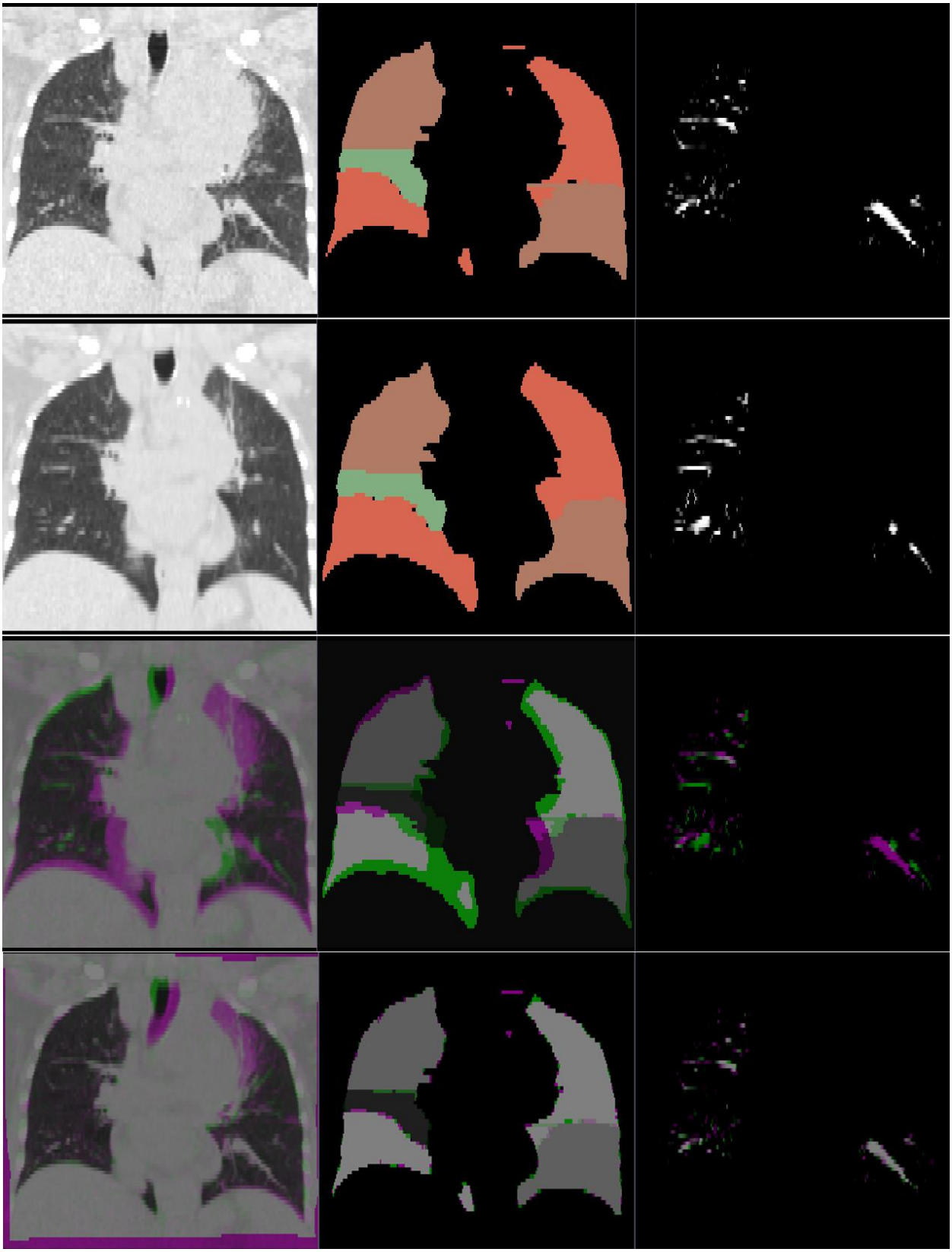
Patient 7



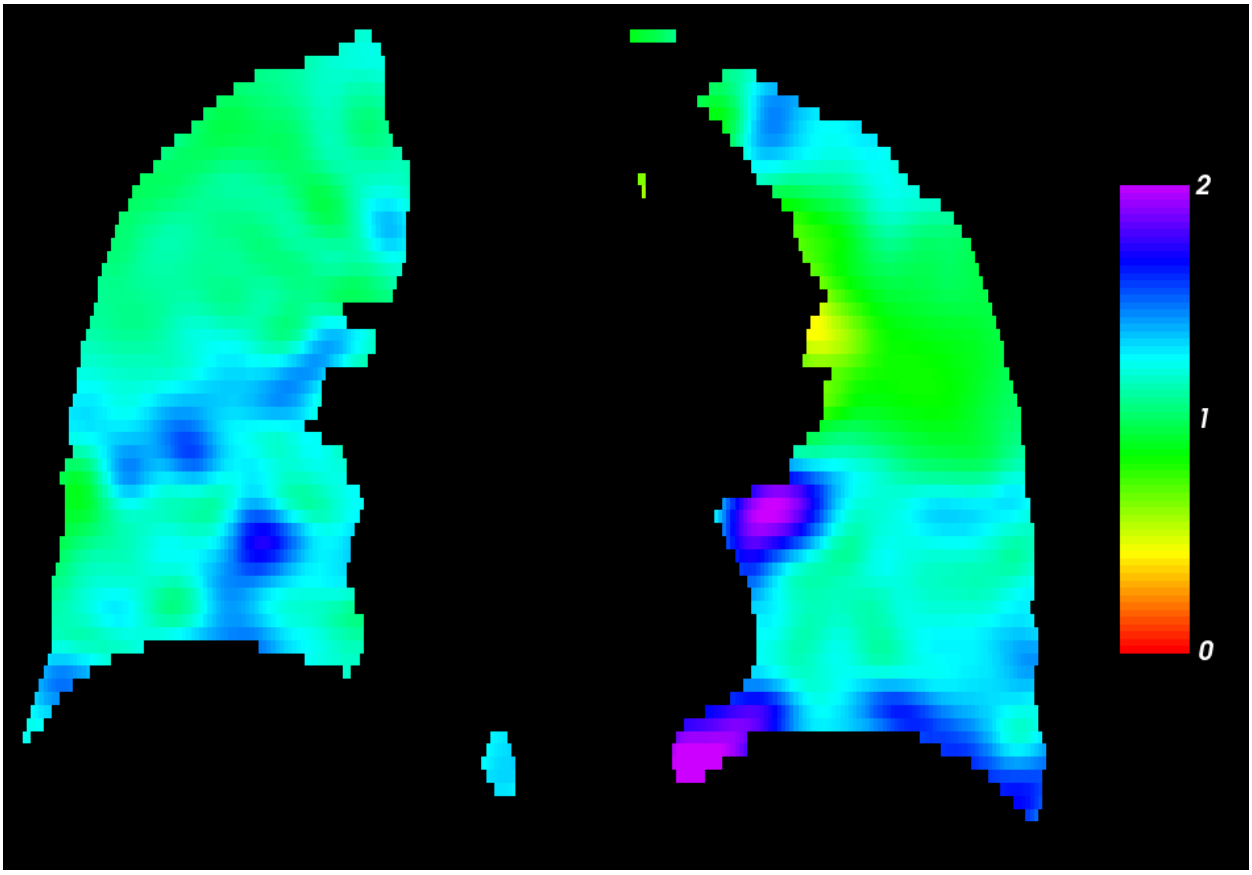
Patient 7



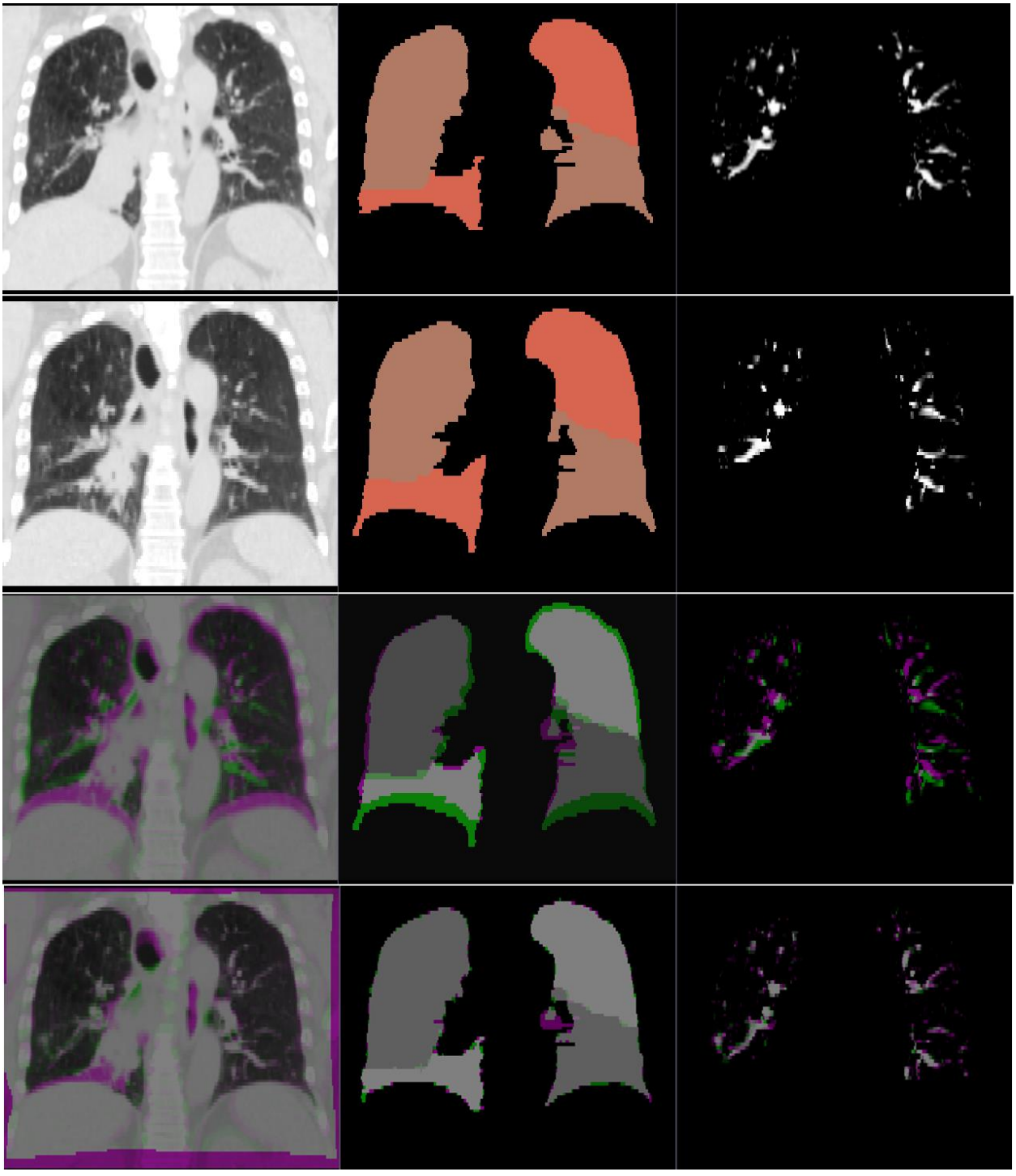
Patient 8



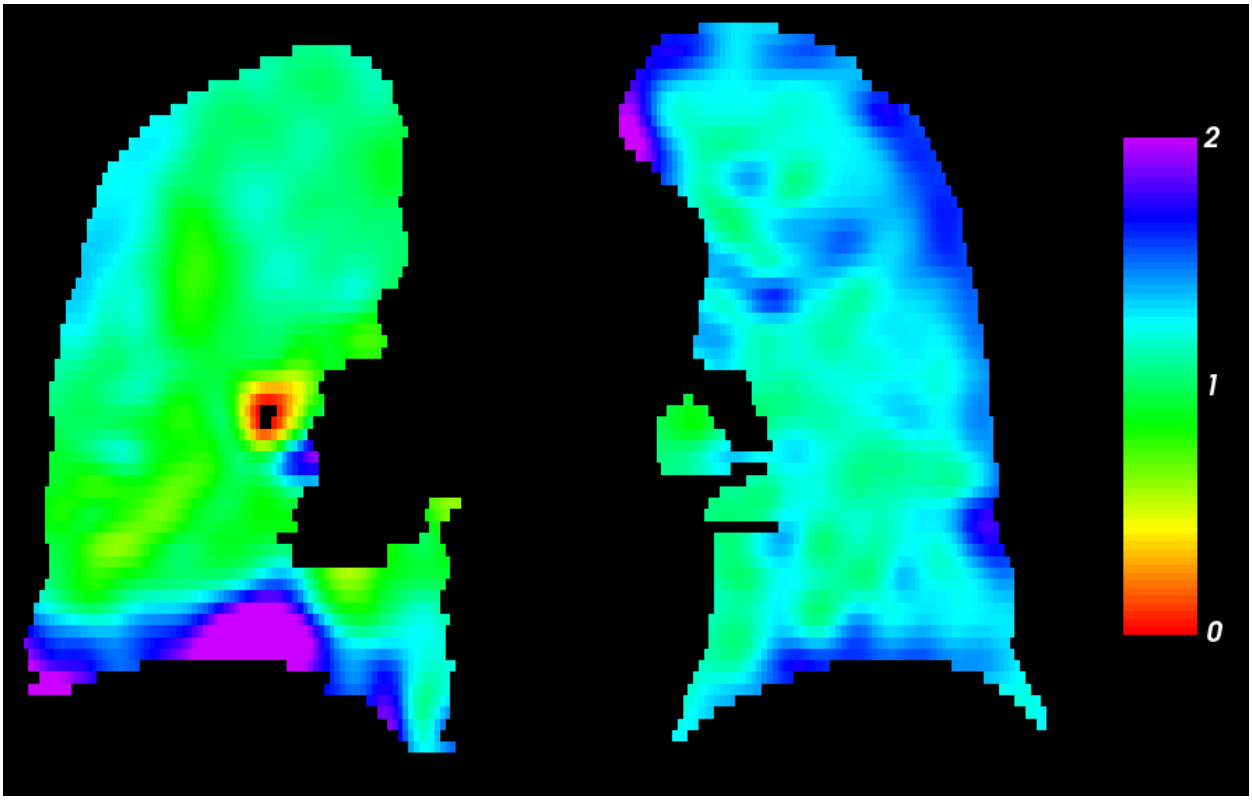
Patient 8



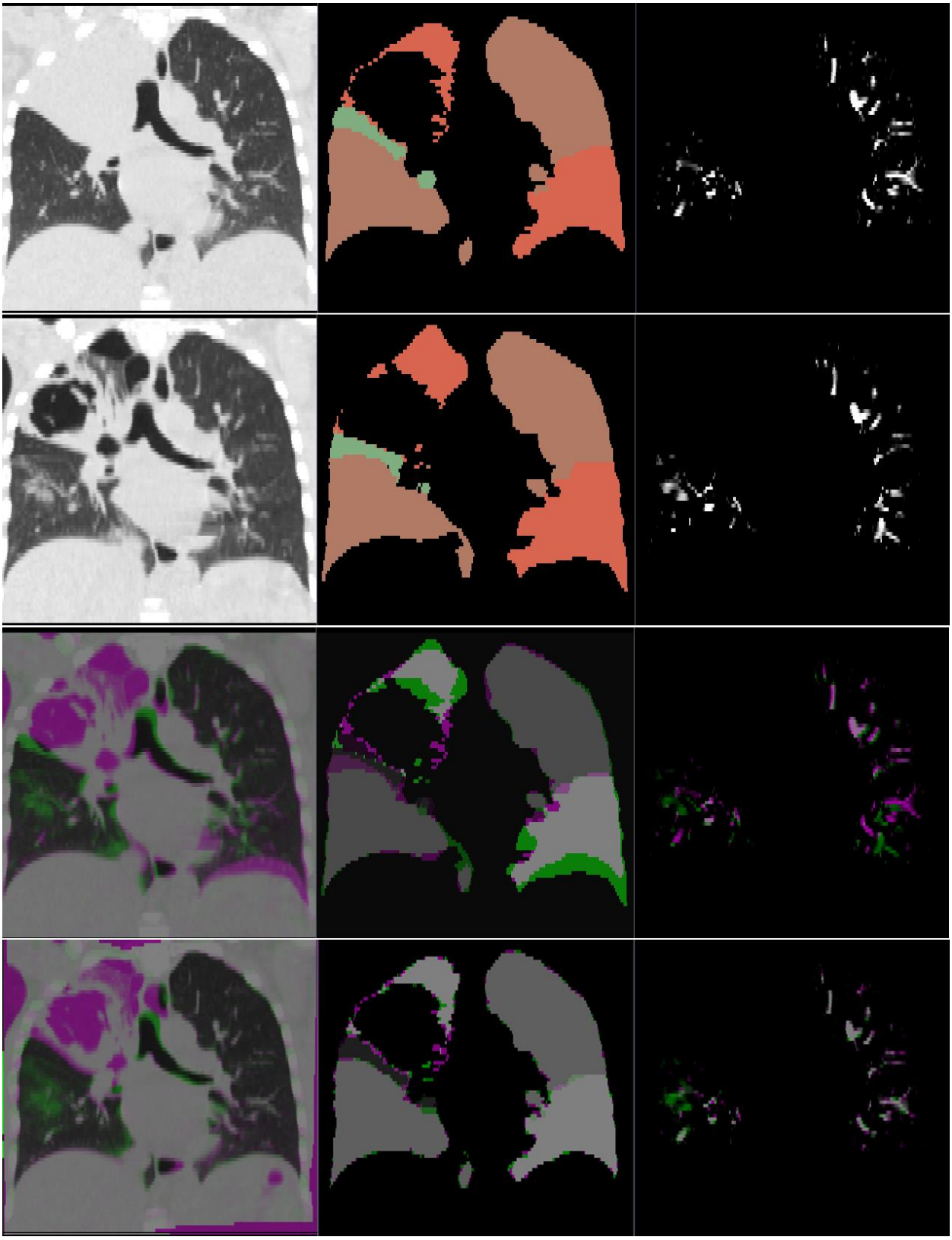
Patient 9



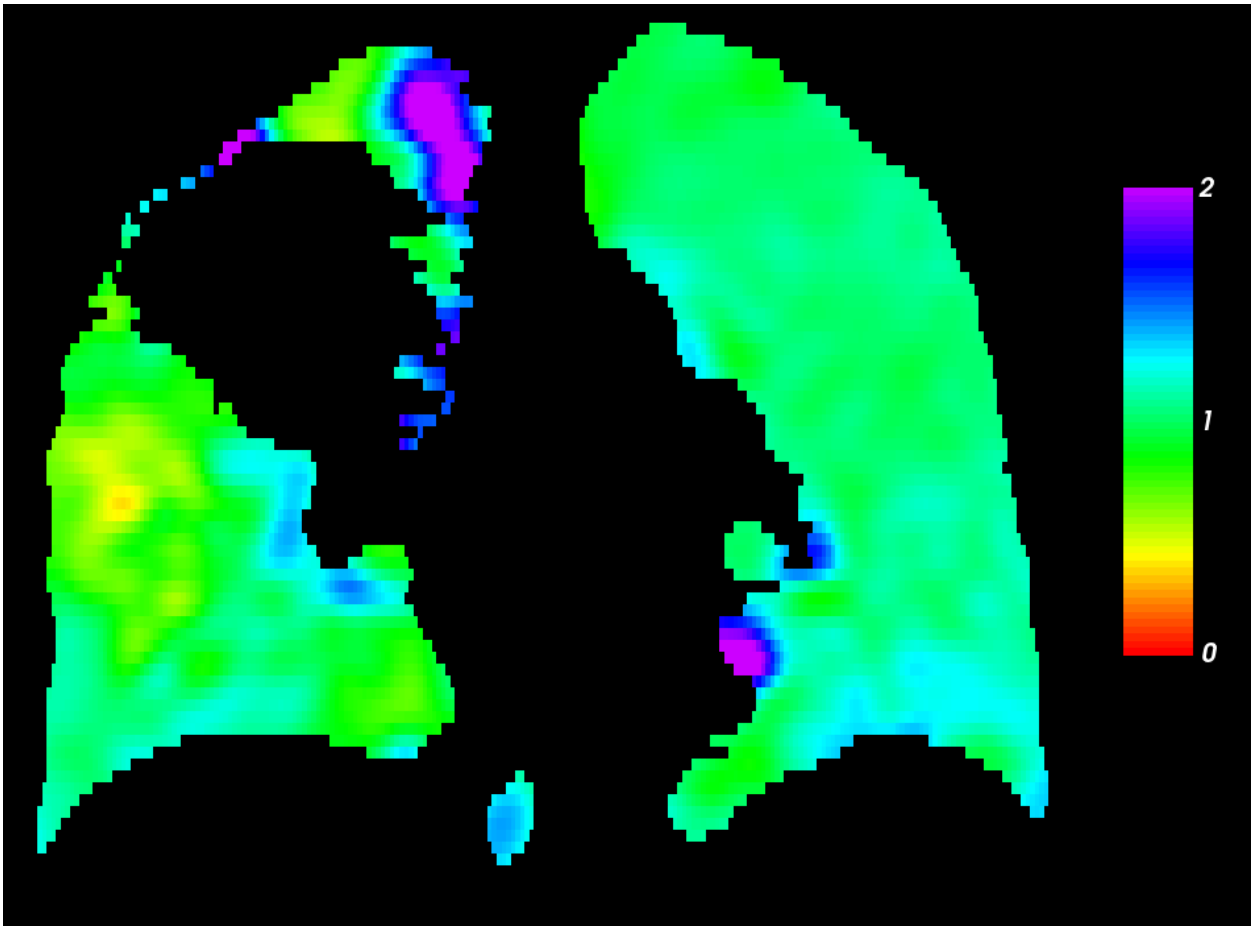
Patient 9



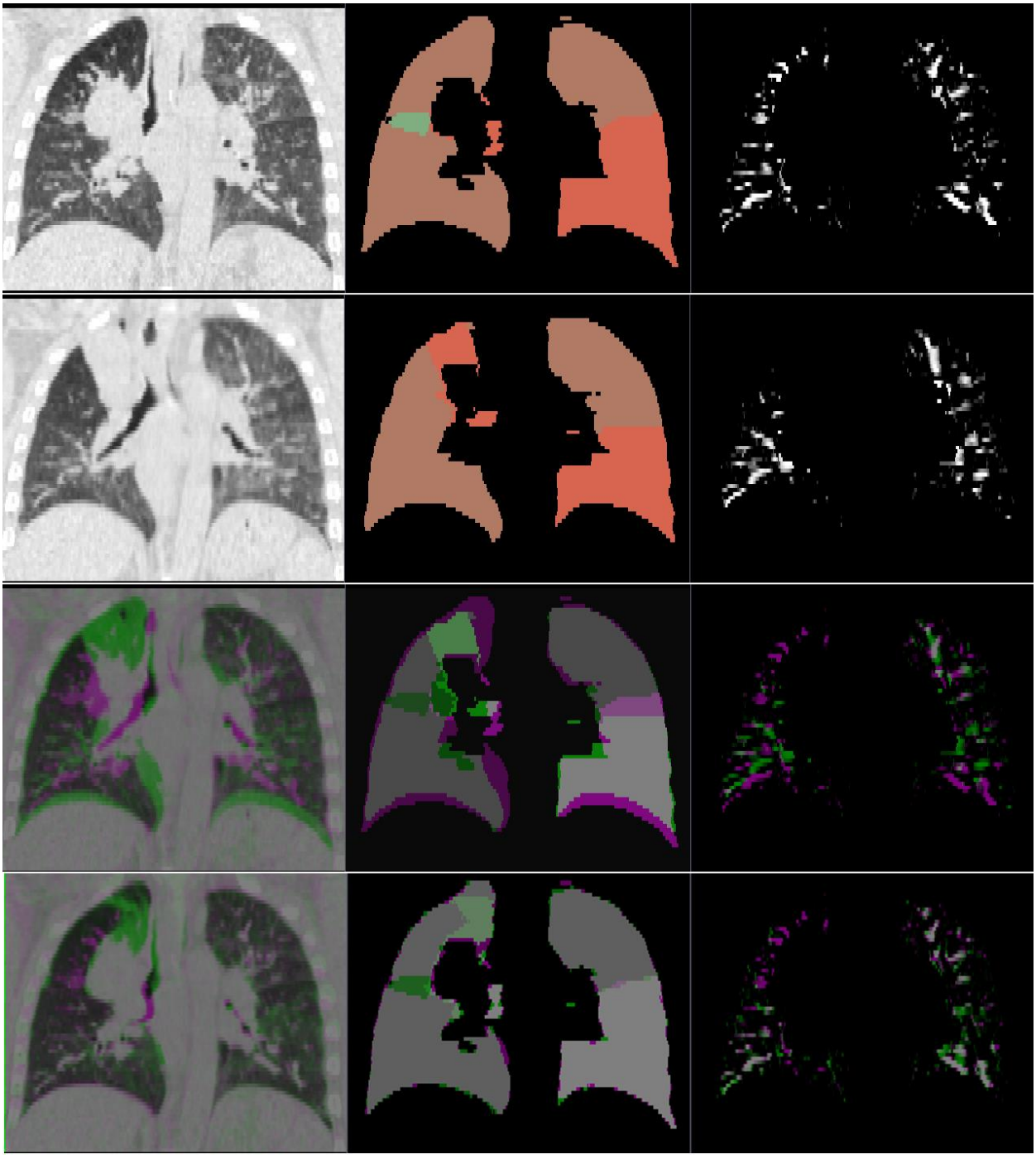
Patient 10



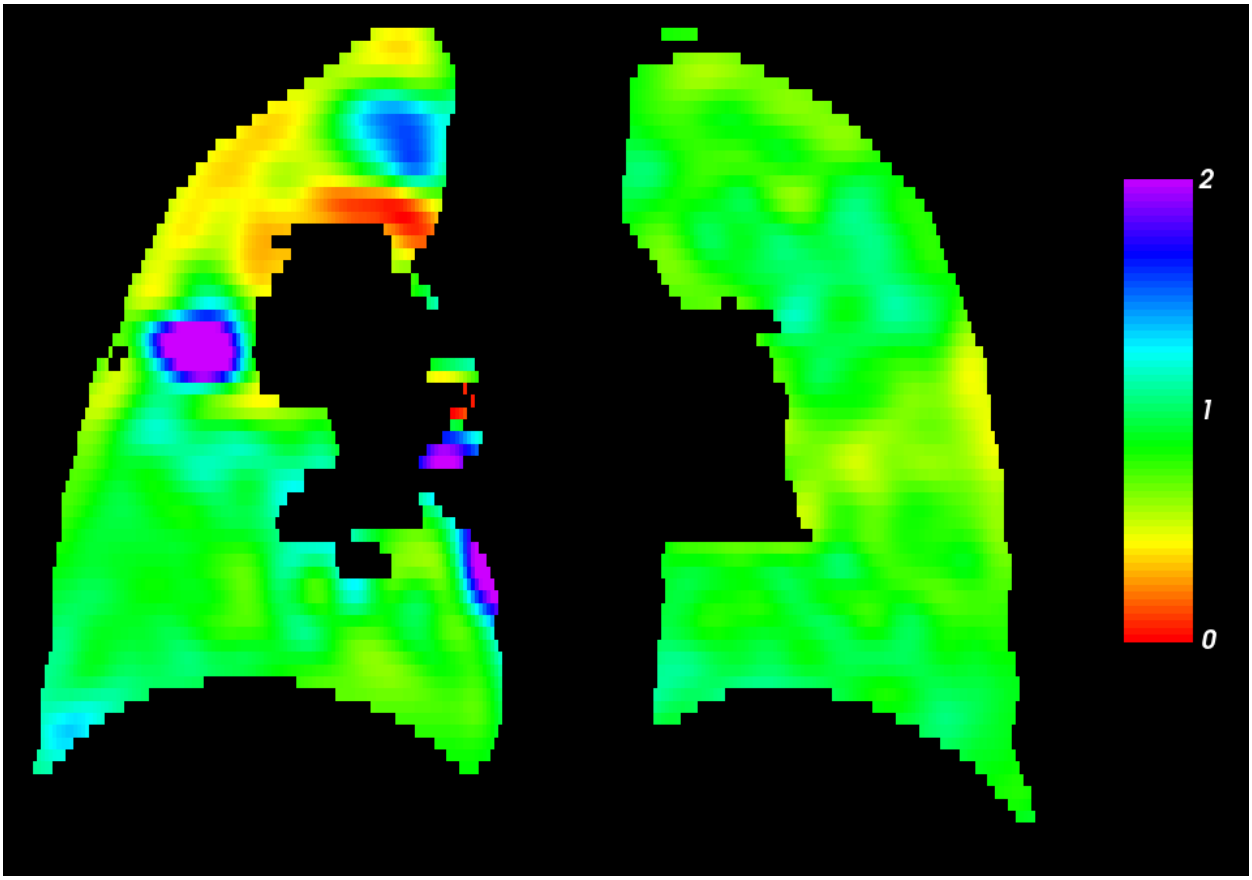
Patient 10



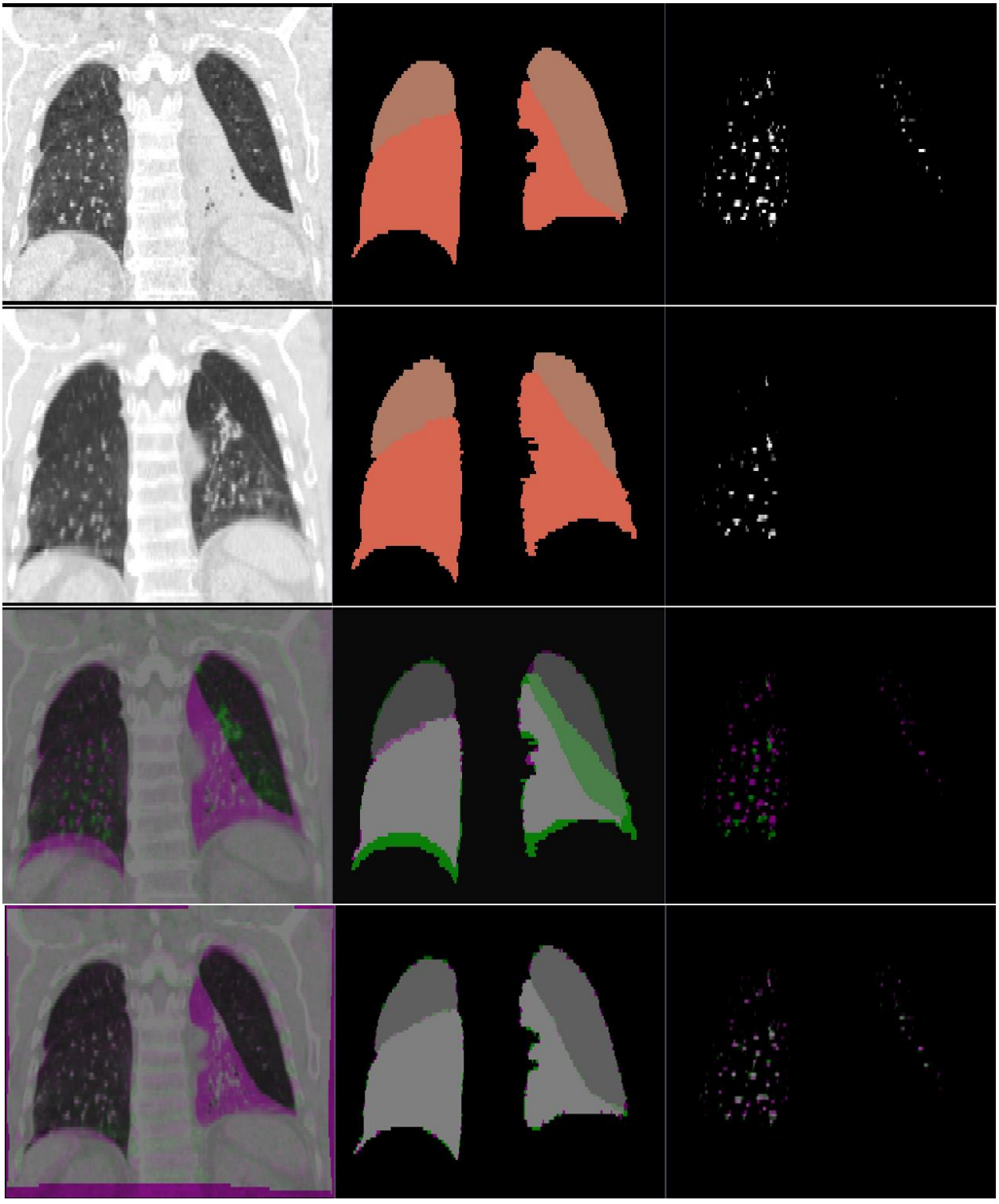
Patient 11



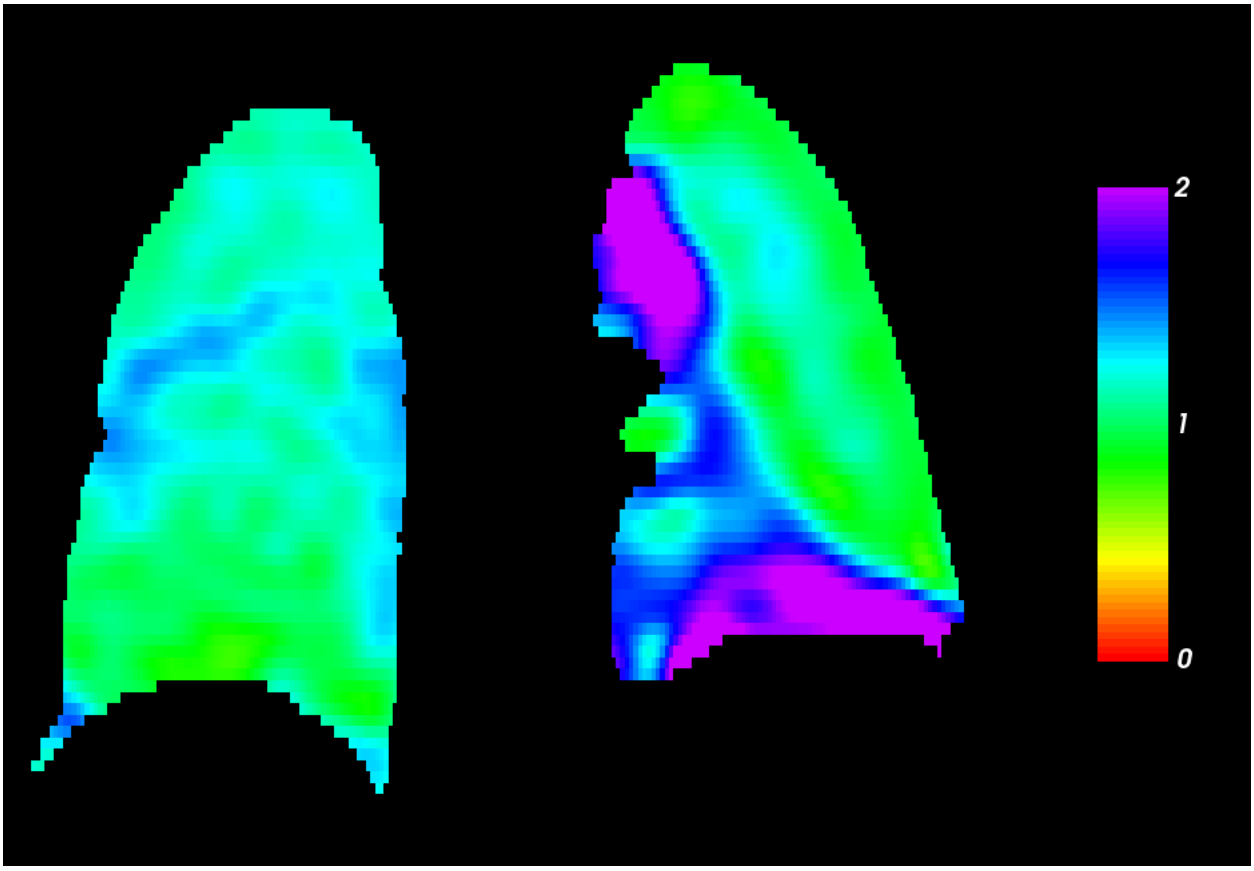
Patient 11



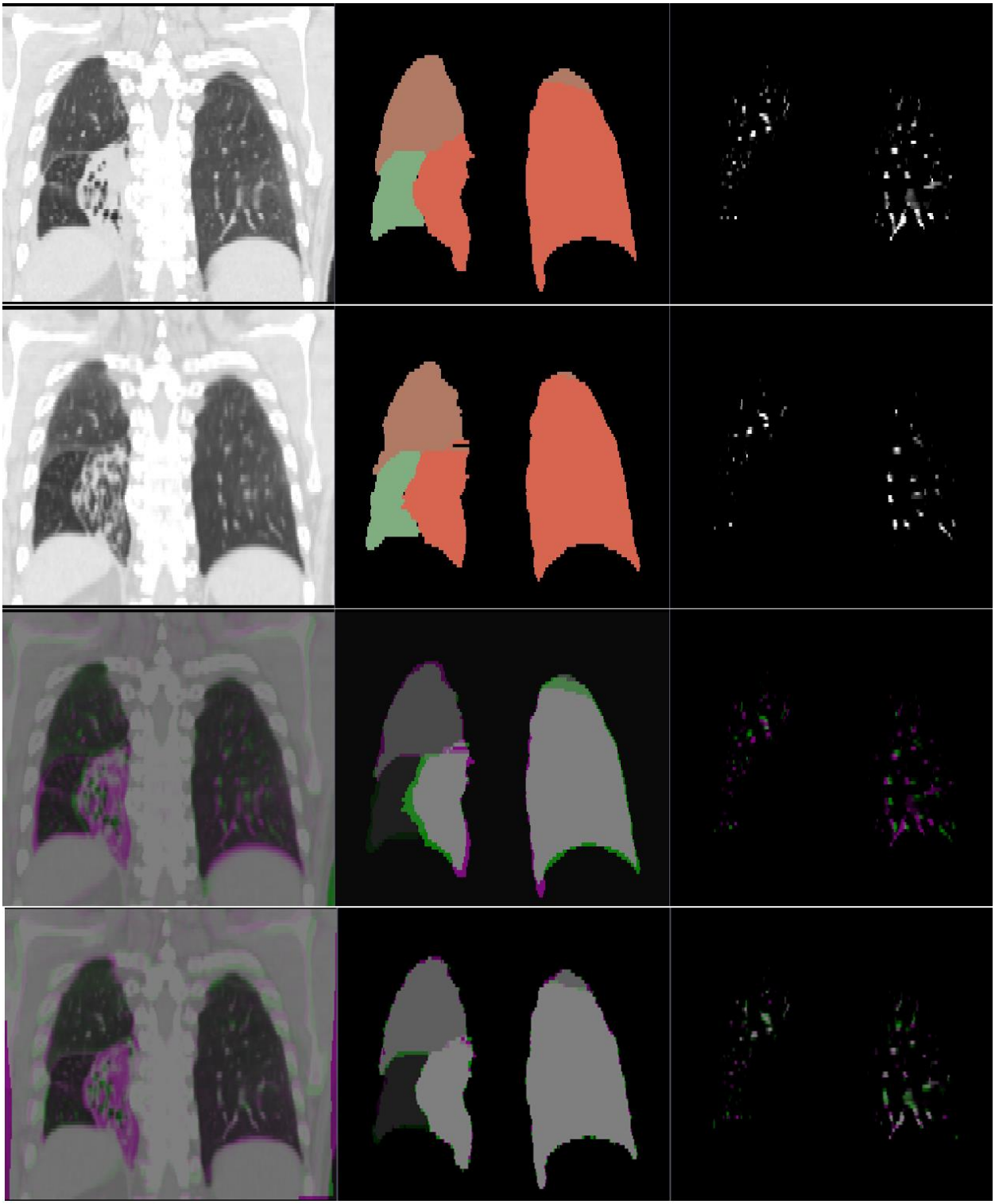
Patient 12



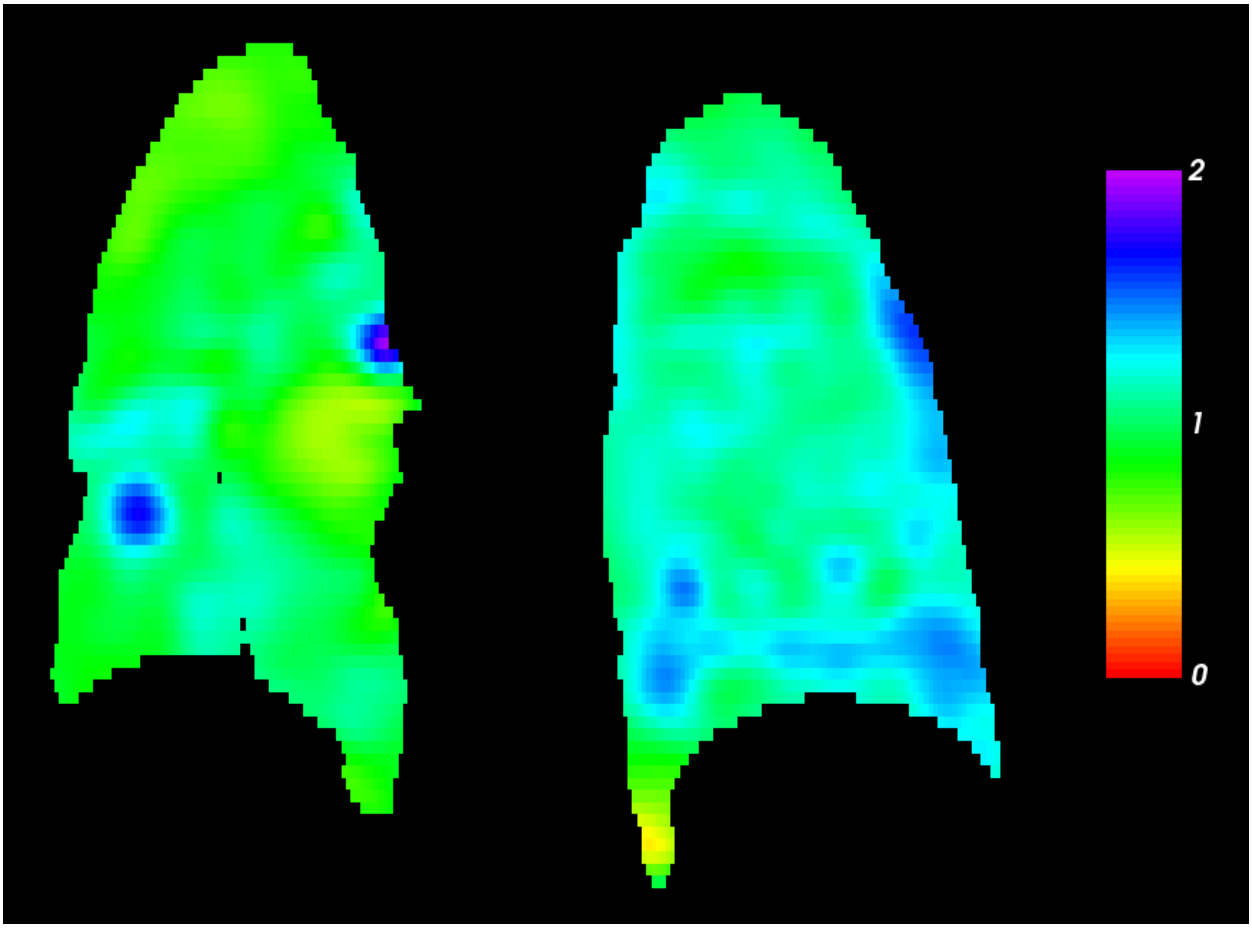
Patient 12



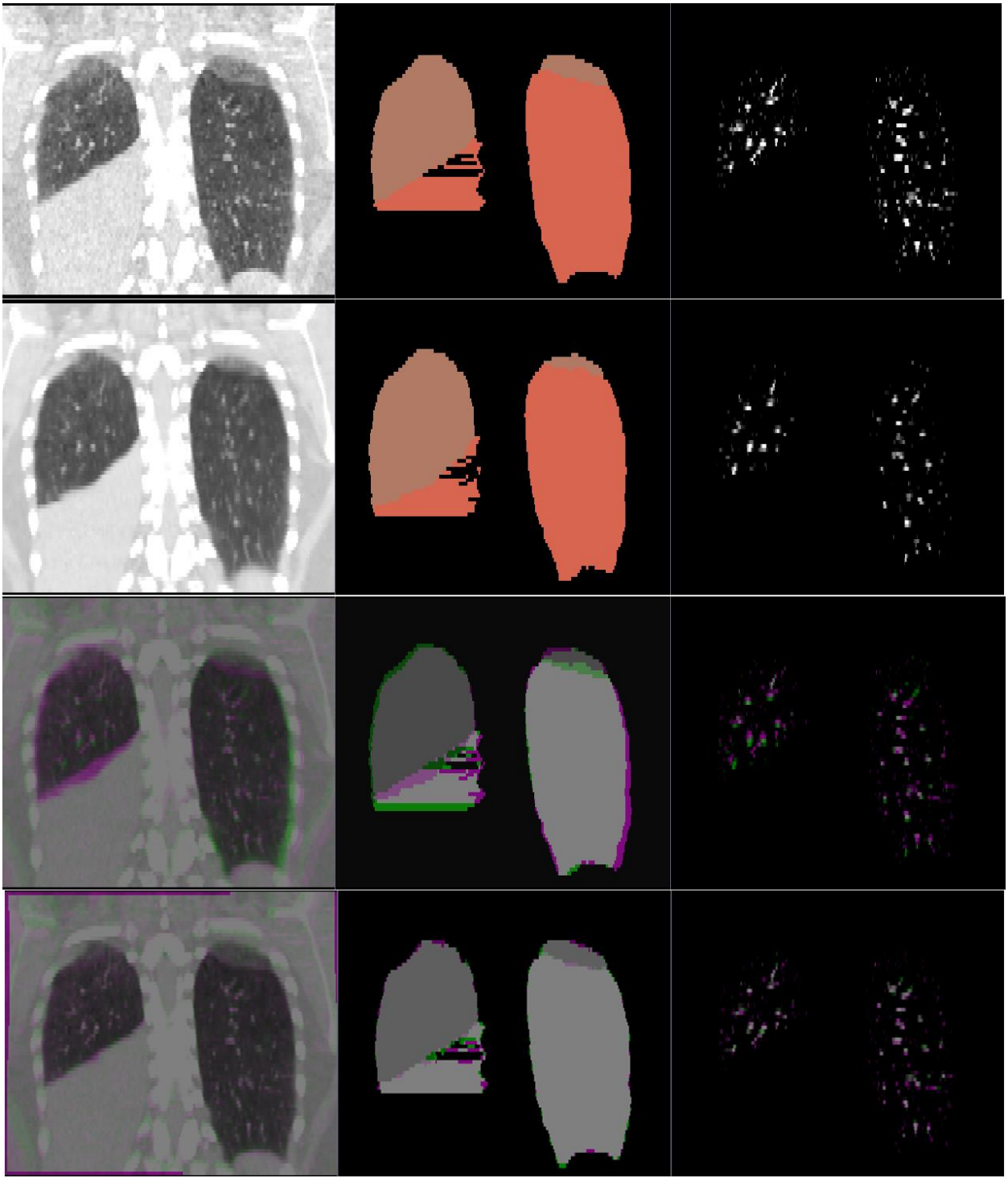
Patient 13



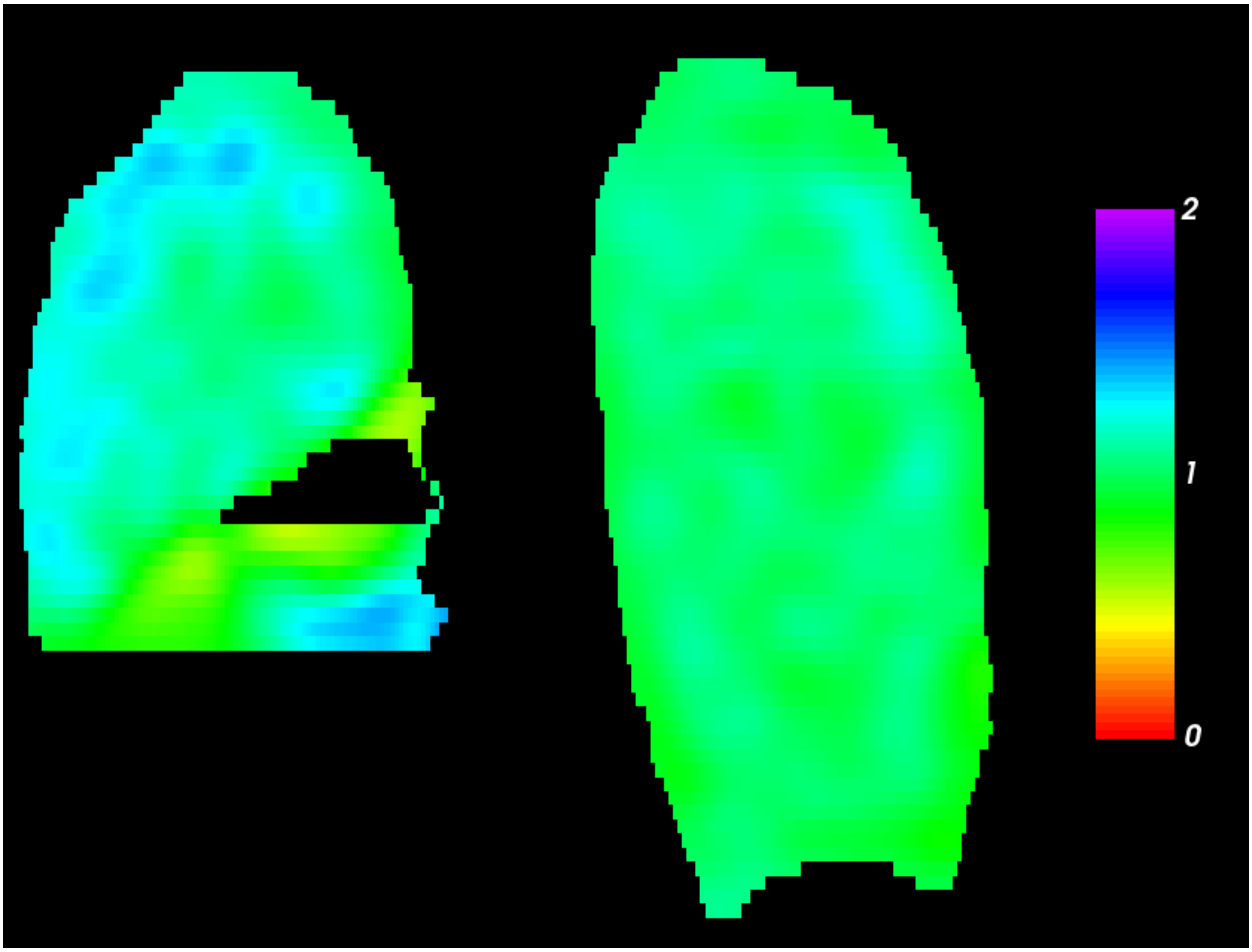
Patient 13



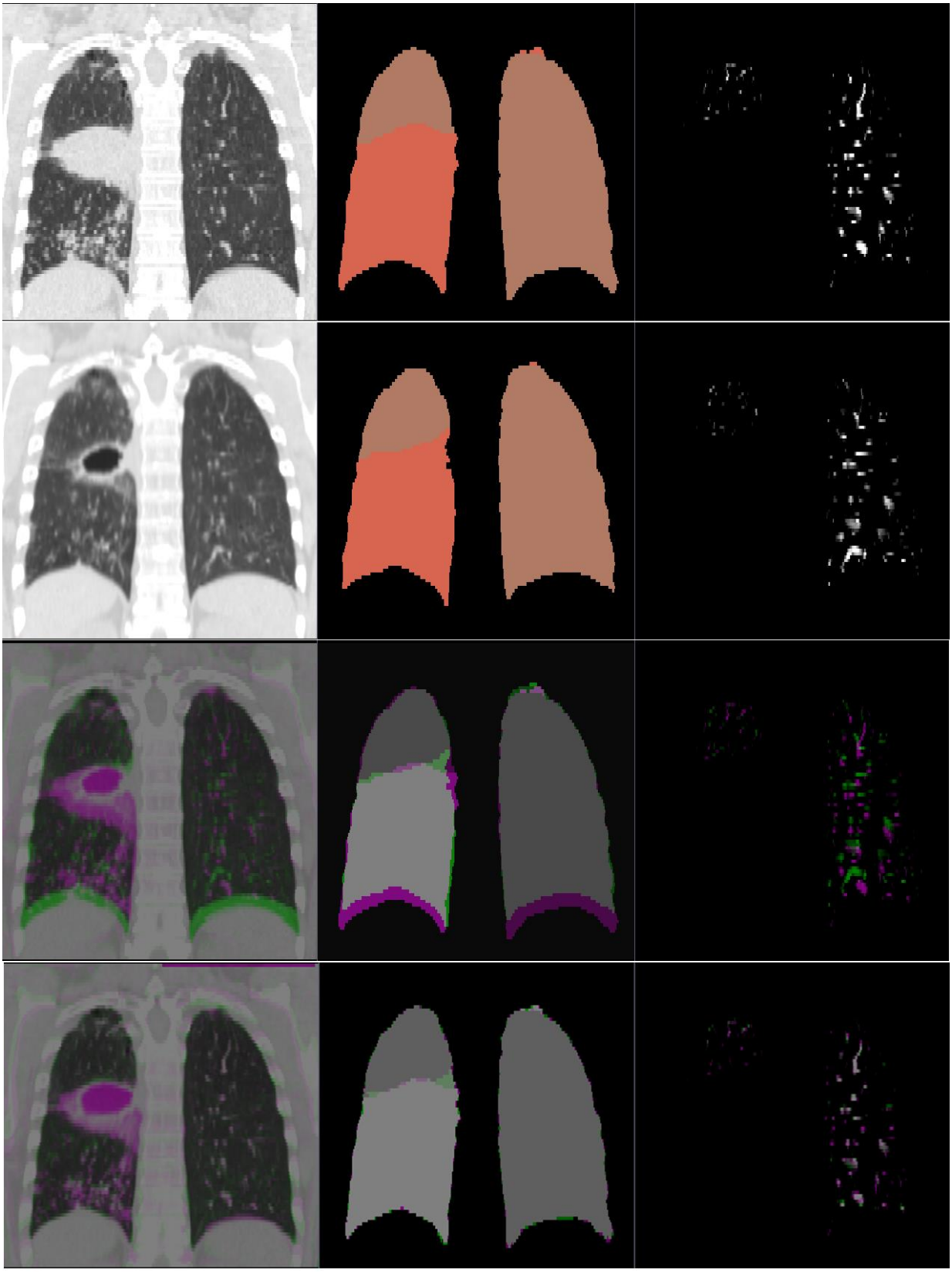
Patient 14



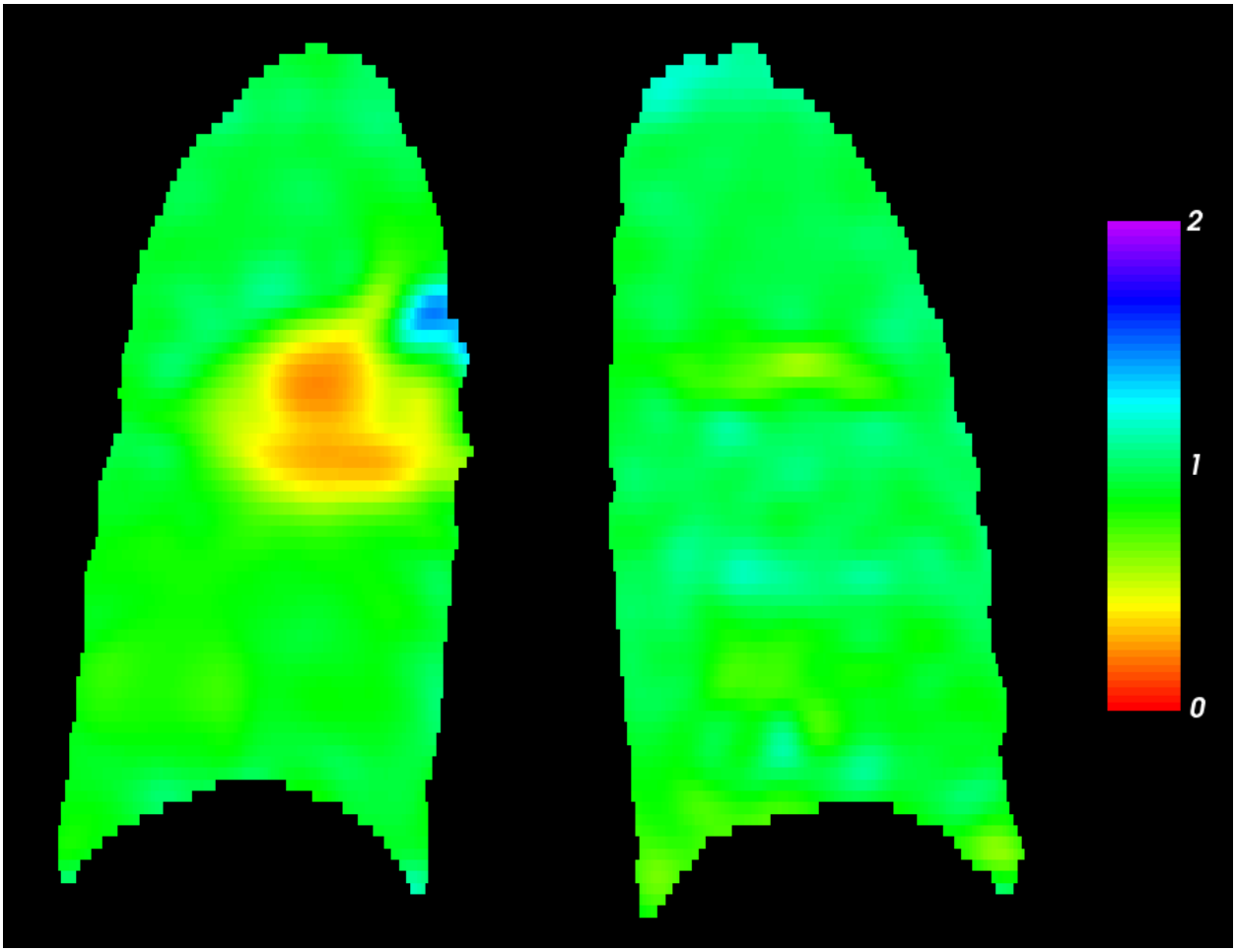
Patient 14



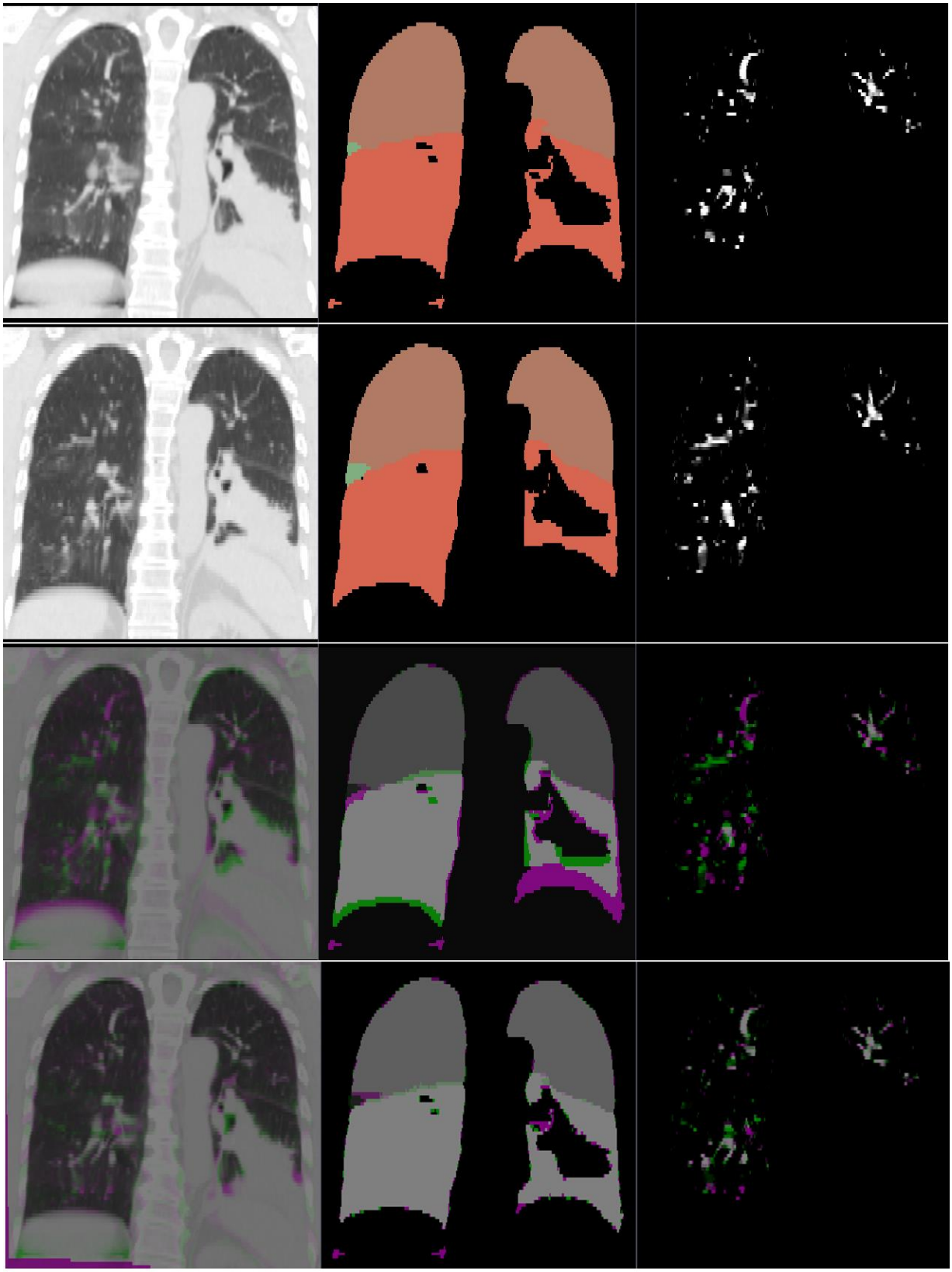
Patient 15



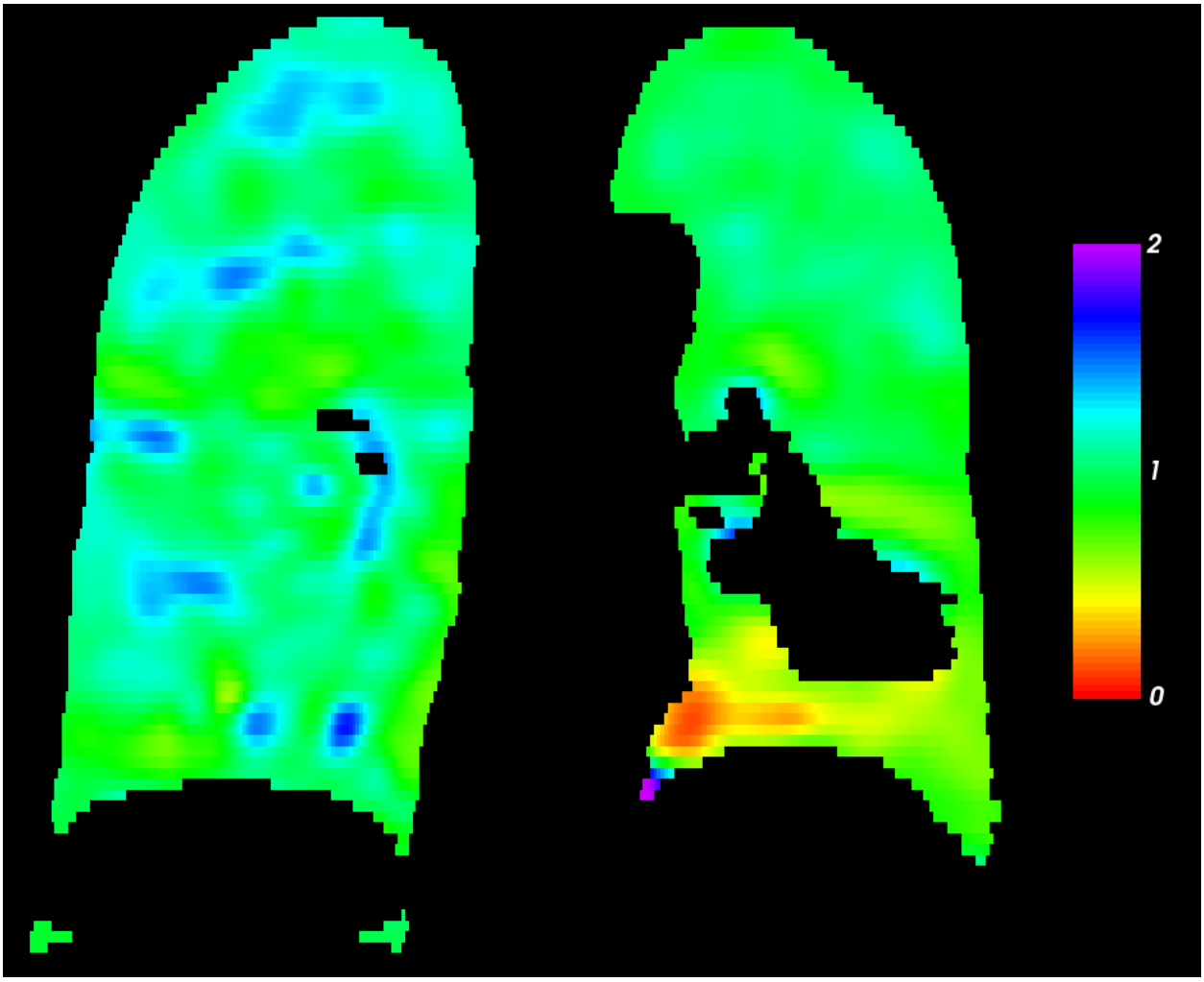
Patient 15



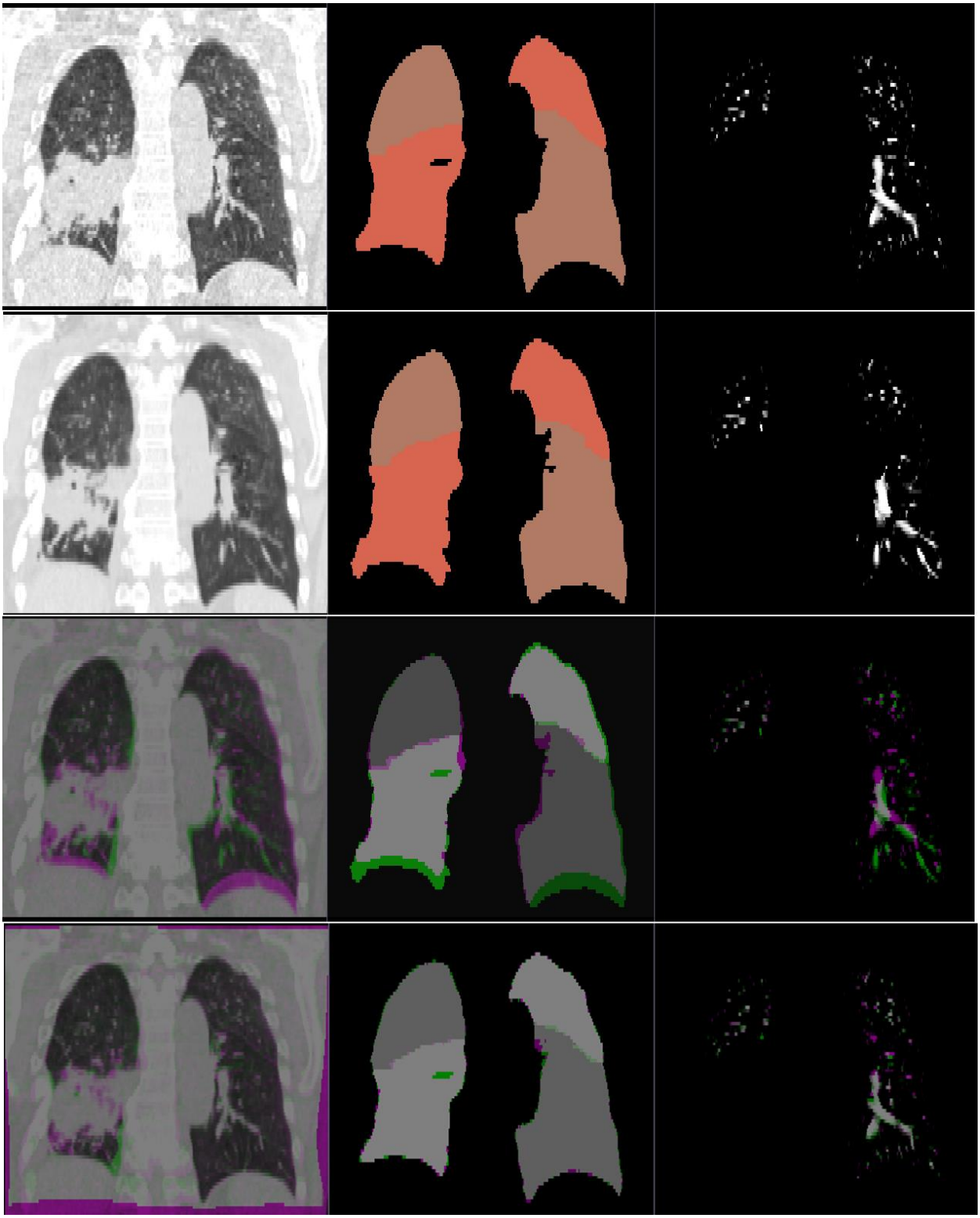
Patient 16



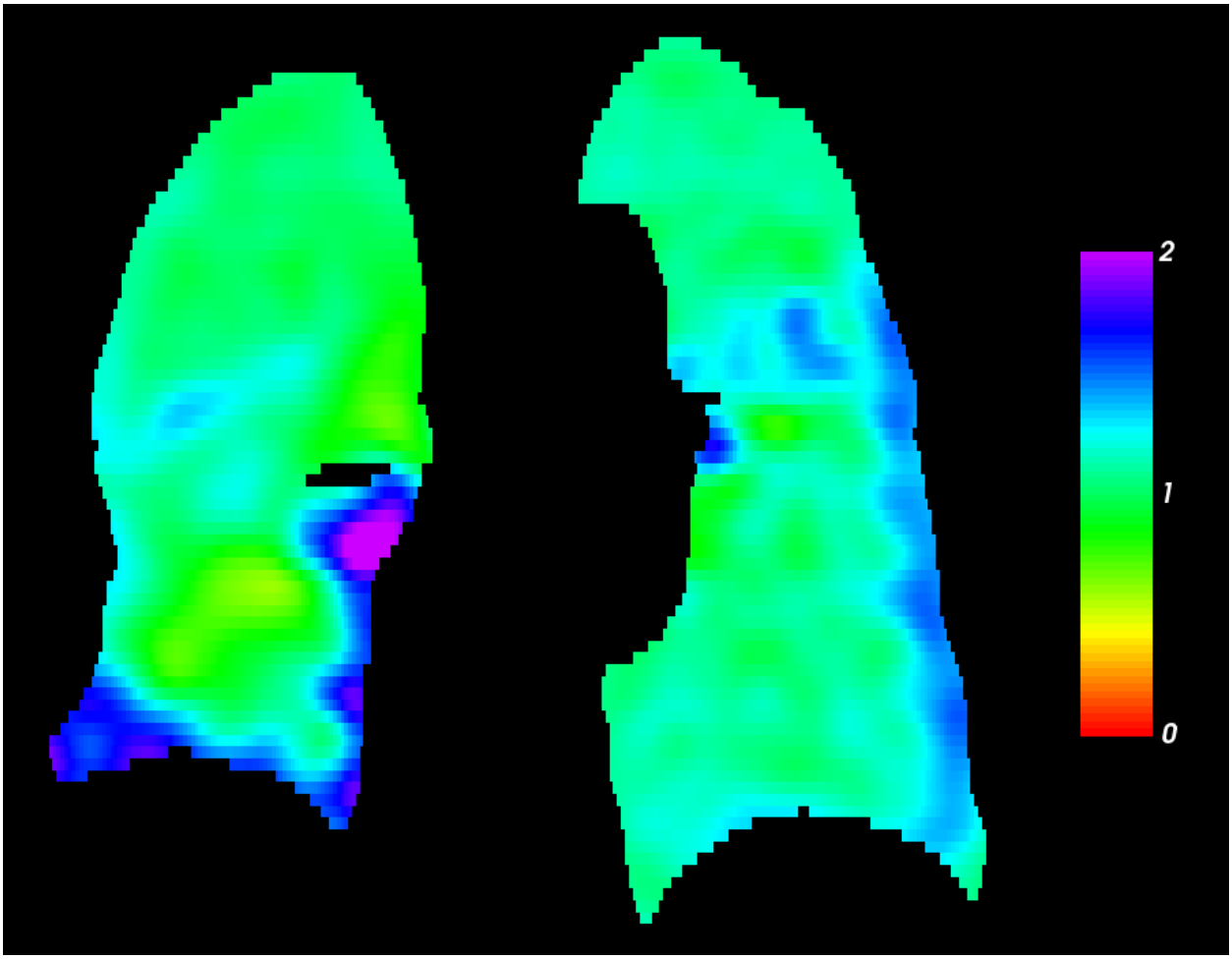
Patient 16



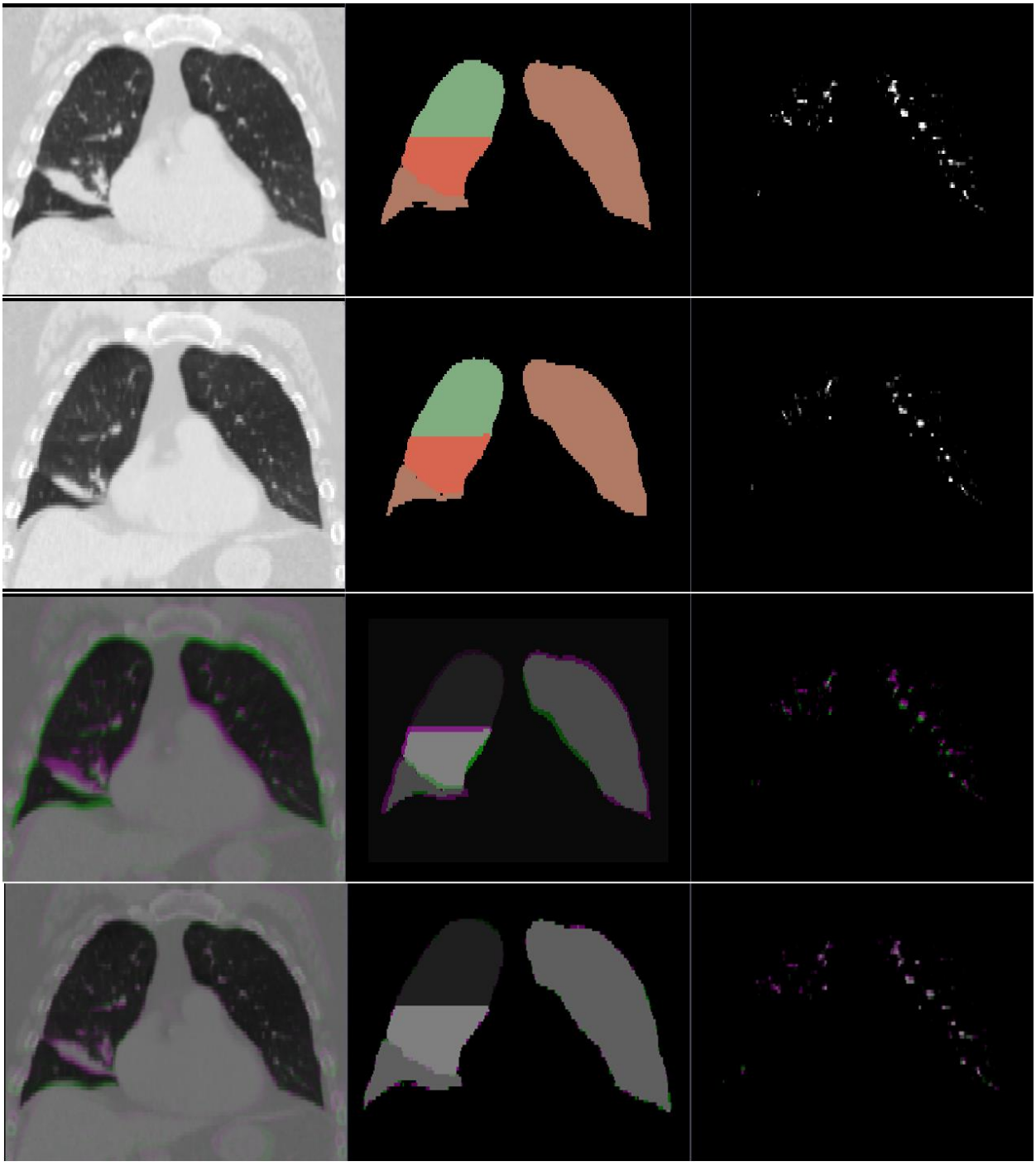
Patient 17



Patient 17



Patient 18



Patient 18