SNMMI CIC - Rapid Clinical Reference: CT findings of COVID-19
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Glossary

Ground-glass opacity (GGO)
A hazy increased opacity of the lung where you can still see the underlying bronchial and vascular margins. [1]

Consolidation
A hazy increased opacity of the lung where you can no longer see the underlying bronchial and vascular margins. [1]

Crazy-paving pattern
Thickened interlobular septa and intralobular lines superimposed on a background of ground-glass opacity. [1]

Halo sign
A GGO surrounding a nodule or mass. This is non-specific.

Reverse halo sign
A focal rounded area of ground-glass opacity surrounded by a more or less complete ring of consolidation. [1]

CT findings – describing in clinical impression [1][6]

Typical for COVID-19
1. Peripheral, bilateral GGO or multifocal rounded GGO +/- consolidation or crazy paving.
2. Reverse halo sign or other signs of organizing pneumonia.
3. NO lymphadenopathy, NO pleural effusion.

Indeterminate for COVID-19
1. Multifocal, diffuse, perihilar or unilateral GGO (not rounded, not peripheral, non-specific distribution) +/- consolidation.
2. A few small GGO (not rounded, not peripheral).

Atypical for COVID-19
1. Tree-in-bud opacities and other small nodules, bronchial wall thickening, and bronchial mucus plugs
2. Isolated lobular or segmental consolidation
3. Lung cavitation
4. Smooth interlobular septal thickening with pleural effusion.

CT findings – changes over time

Subclinical
Subclinical patients have been reported as having unilateral, multifocal, and predominantly ground-glass opacities. [4]

Week 1
Negative CT can be seen in the first two days. [6]
In the first week of symptoms, these findings evolved to bilateral, diffuse disease, a relative decrease in the frequency of ground-glass opacities and new consolidation and mixed-pattern development. [7][2]

Week 2
In week two, ground glass densities decreased further as consolidation became predominant with new bronchiolectasis and irregular interlobular or septal thickening. [7]

Week 3
In week three, glass densities decreased even further with more common consolidation and mixed patterns with more likely bronchiolectasis, thickening of the adjacent pleura, and pleural effusion. [2][7]

References
**Further reading**
Last accessed 2 May 2020


CT findings of viral pneumonias - Radiographics https://pubs.rsna.org/doi/10.1148/rg.2018180048

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**CME questions**

1. Which of the following is a typical CT finding for COVID-19:
   - A. A few small ground glass opacities (not rounded, not peripheral)
   - B. The halo sign
   - C. The reverse halo sign
   - D. Unilateral pleural effusion
   - E. Bilateral pleural effusion

2. Crazy paving is best described as:
   - A. Tethering of the pleura.
   - B. A hazy increased opacity of the lung where you can still see the underlying bronchial and vascular margins.
   - C. A hazy increased opacity of the lung where you can no longer see the underlying bronchial and vascular margins.
   - D. Thickened interlobular septa and intralobular lines superimposed on a background of ground-glass opacity.
   - E. A focal rounded hazy increased opacity of the lung surrounded by a more or less complete ring of consolidation.

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**CT Examples of COVID (+) cases**

- Early ground-glass change
- Lobar consolidation
- Peripheral ill-defined ground-glass opacities (GGO)