A Radiology Department’s Quality and Safety Improvement:  
A Latin American Firsthand COVID-19 Experience

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Introduction

- Radiology plays an important role since chest computed tomography (CT) has proved to be a useful tool for evaluating COVID-19 findings:
  - It can reveal disease extension and complications;
  - Its widespread use in COVID-19 screening is not recommended.

- Considering quality and safety, reviewing processes in a radiology department to face a pandemic has been quite challenging.

- Our Radiology Department is part of a not-for-profit private hospital:
  - In 2018, the hospital had 579 beds and performed 5,131,194 diagnostic laboratory and imaging tests;
  - Since the first recorded COVID-19 cases in Brazil, we have observed an increase in chest CT demand (Fig. 1).

**Figure 1.** Total number of chest computed tomography exams ordered by the emergency department for confirmed or suspected coronavirus disease 2019 cases during the first weeks.
Purpose

• To describe our department’s policies for COVID-19 preparedness (focusing on quality and safety) for:
  
  • COVID-19 patients undergoing exams;
  • The healthcare team involved in the exams;
  • Policies involving the ordering physician;
  • Improvements in the radiology reporting workflow;
  • Hospital environment adjustments;
  • Other measures for pandemic preparedness.
Outpatient exams

• Ensure an effective triage of COVID-19 positive or suspected patients and establish droplet precautions;

• Comply with room cleaning procedures after the examination (aerosol and/or droplet precautions);

• Use an electronic self-service queue token (Fig. 2);

• Assure that the staff wears PPEs (Fig. 3).
Radiologists

• Prepare all radiologists to recognize typical COVID-19 CT findings;
• Encourage working from home;
• Require the use of PPEs (Fig. 4).

Reporting workflow

• Flag exams on the radiology information system;
• Call the ordering physician to report an incidental diagnosis of COVID-19 infection.
Appendix 1. A structured report was developed to optimize workflow

<table>
<thead>
<tr>
<th>Technique</th>
<th>High-resolution computed tomography of the lungs</th>
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<td>Multislice helical CT, no intravenous contrast.</td>
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**Indication**

Evaluation of pulmonary infectious process (investigation of pulmonary involvement by COVID-19).

**Analysis**

[Covid-19 positive] Multiple ground-glass pulmonary opacities, sometimes associated to interlobular septal thickening, fine reticulation (in addition to sparse consolidation foci), presenting bilateral multifocal distribution, mostly peripheral and posterior, and more extensively in the lower lobes. Although not specific, such findings are consistent with viral pneumonia, and the possibility of COVID-19 should be considered among the differential diagnoses.

[Severity estimate] The estimated extent of lung involvement on tomography is (lesser / greater) than 50% (visual analysis).

[Pneumonia of unknown etiology] Patterns that are neither typical nor completely atypical of COVID-19. These findings are not specific, but they usually represent a pulmonary inflammatory/infectious disease; COVID-19 could be included among differential diagnoses.

[Lobar pneumonia, bronchopneumonia, infectious bronchiolitis] Such findings are compatible with the pulmonary infectious process, whose characteristics are not commonly found in cases of lung involvement by COVID-19; other etiologic agents should be initially considered for differential diagnoses.

[No sign of infection] Absence of focal pulmonary opacities suggestive of an active parenchymal infection. It should be noted that the absence of tomographic signs of pneumonia in the first days after onset of symptoms does not rule out COVID-19.

**Other findings**

Absence of pleural effusion.

Remaining lung parenchyma with no significant changes.

No mediastinal lymphadenopathy.

Other thoracic structures with no relevant changes in the clinical context.

Hospital environment

• Perform X-ray and ultrasound on the bedside;
• Create separate paths for positive and negative COVID-19 patients to avoid hospital-acquired infection.

Other measures

• Test and isolate positive healthcare providers;
• Temperature measurement for all healthcare providers upon arrival at work;
• Use of surgical masks by all workers;
• Postponing outpatient consultation;
• Enhance the use of Telemedicine;
• Keep communication opened.
Conclusion

• We detailed the quality and safety innovations of our Radiology Department to meet the demands of a new reality during a pandemic crisis.

• Our aim is to assure quality of health services provided and safety of our patients and employees.

• Describing our experience, we expect to provide useful information and examples of innovations that can help other radiology departments.

• Some of the newly applied measures will certainly remain in practice once the outbreak is over.
References

Thank you!

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