ALBERT EINSTEIN
SOCIEDADE BENEFICENTE ISRAELITA BRASILEIRA

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A Radiology Department's Quality and Safety Improvement:

A Latin American Firsthand COVID-19 Experience

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Introduction

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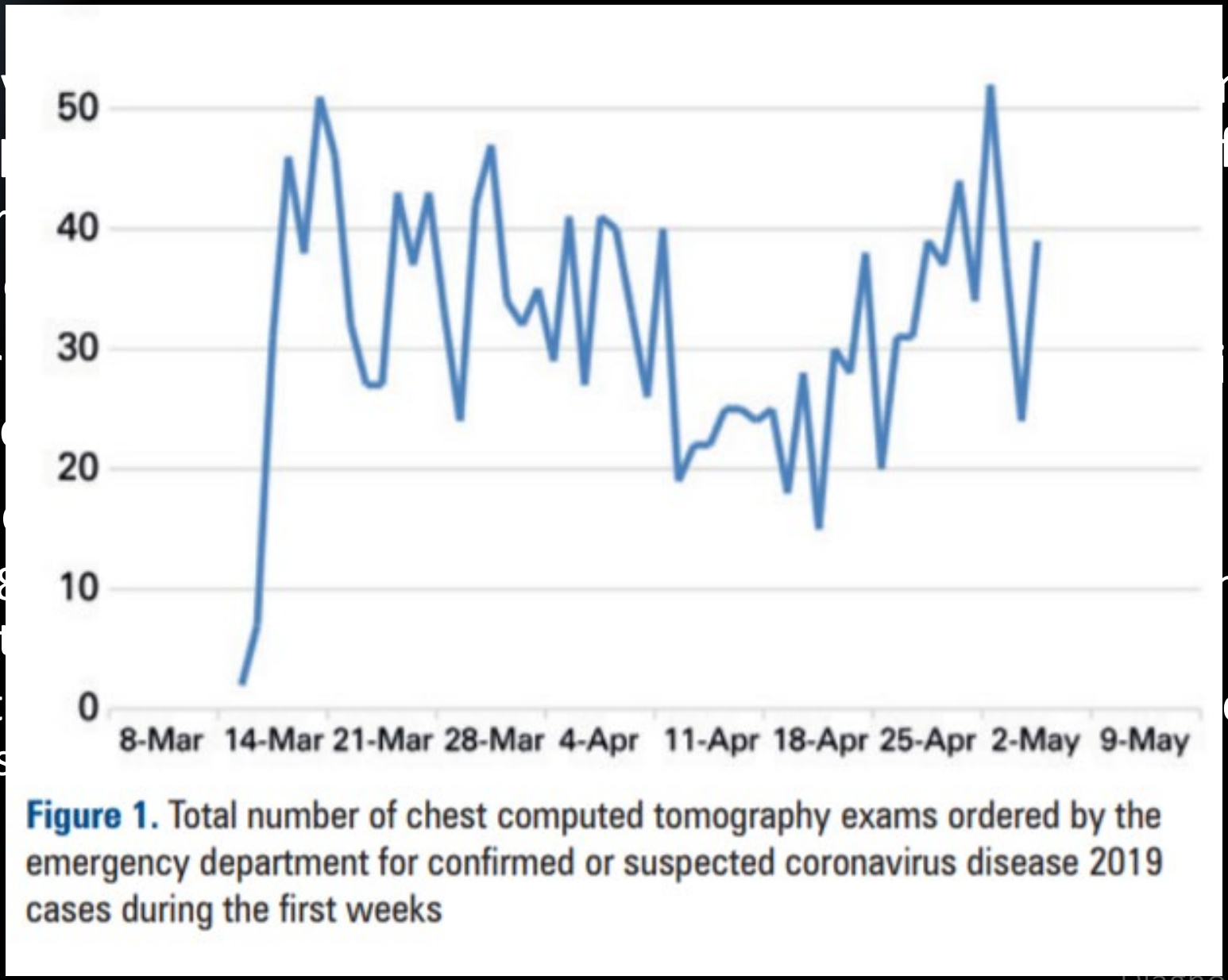

Figure 1. Total number of chest computed tomography exams ordered by the emergency department for confirmed or suspected coronavirus disease 2019 cases during the first weeks

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).

Figure 2. Electronic self-service queue ticket totem used to identify patients suspected of airway infections during COVID-19 pandemic. A question about signs or symptoms of epidemic diseases including COVID-19 infection was

Figure 3. Instructions for the correct use of the personal protective equipment for contact, droplet and aerosol precautions, including safety glasses, N95 mask, gloves and gown. All healthcare professionals that take care of COVID-19 patients must comply

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.

Figure 4. Radiologists perform all the ultrasound examinations in our institution, and were instructed to carried out exams of the COVID-19 patients at bedside. Personal protective equipment, such as gloves, gowns, face mask, and safety glasses, with the respective training of usage was made available to all involved

Appendix 1. A structured report was developed to optimize workflow

High-resolution computed tomography of the lungs
Technique
Multislice helical CT, no intravenous contrast.
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.

CT: computed tomography; COVID-19: coronavirus disease 2019.

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.

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Thank you!

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