

# Medical Physics During the COVID-19 Pandemic: North American Perspective

**Brent C. Parker, PhD, DABR, FAAPM**

Professor, Department of Radiation Physics, MD Anderson Cancer Center  
Chair, AAPM Professional Council

## Disclosures and Conflicts

- I have nothing to disclose and no conflicts of interest

# Introduction



M. Saiful Huq, PhD



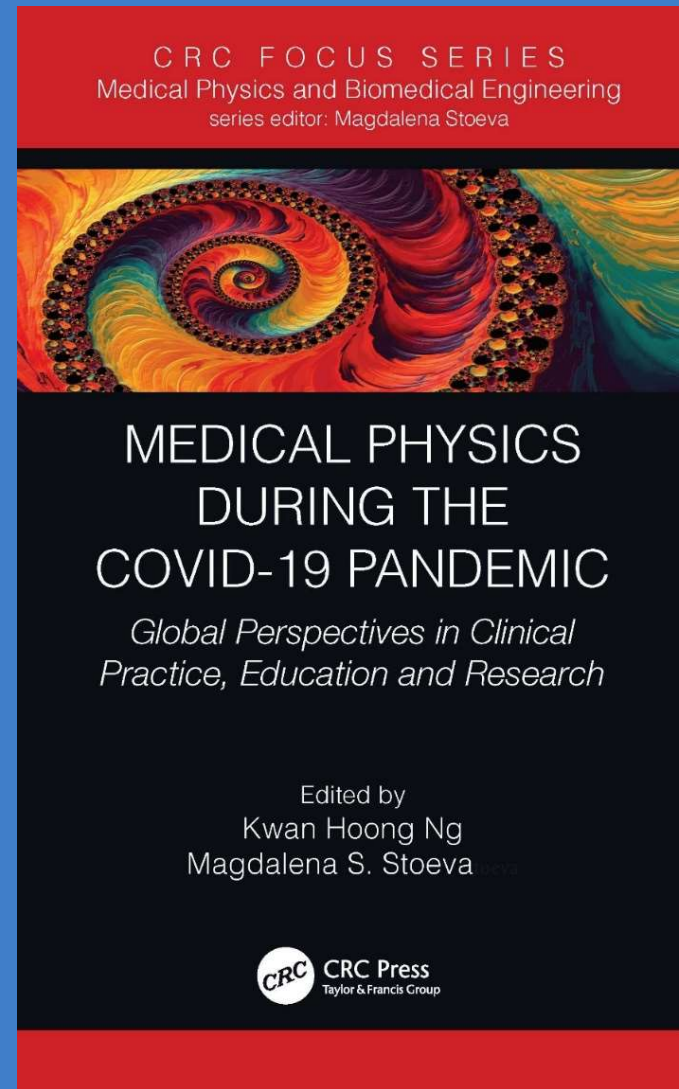
David Jordan, PhD



Charles Kirkby, PhD



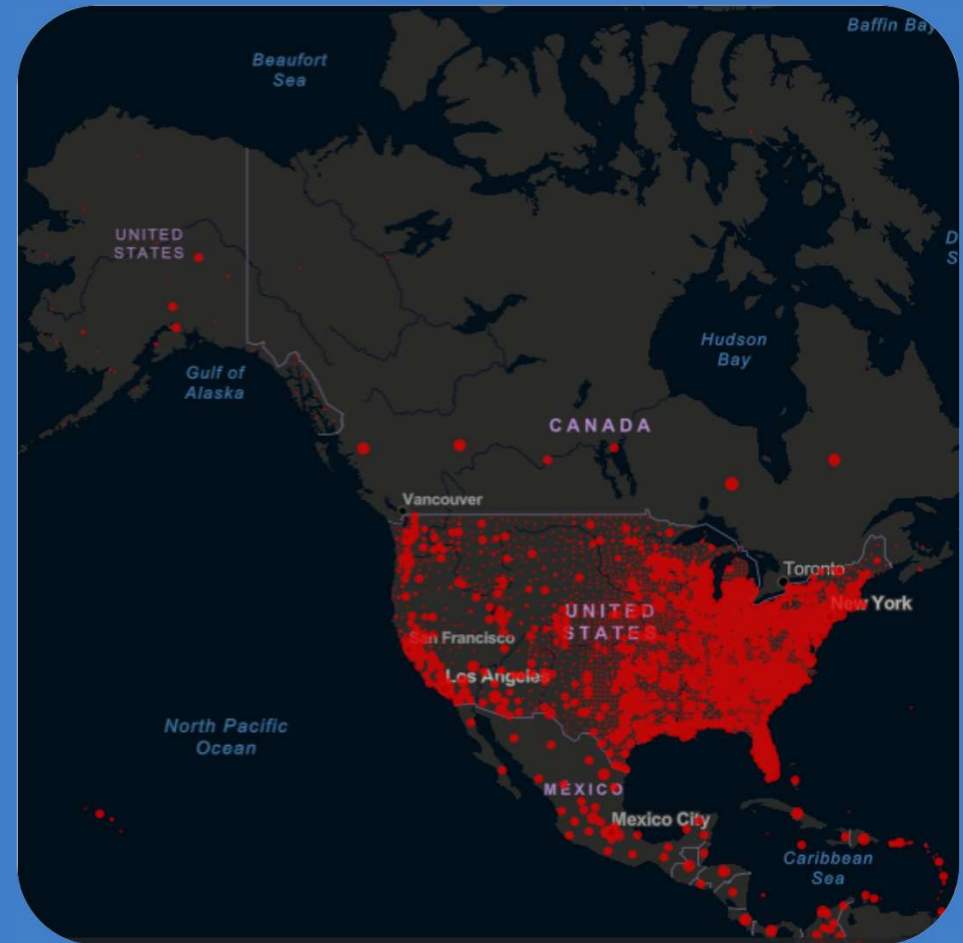
Brent Parker, PhD



## Introduction

- January 2020
  - Appeared in North America
- October 2, 2020
  - ~9,000,000 total cases
  - ~313,000 deaths
- May 18, 2021
  - ~39,300,000 total cases
  - ~880,000 deaths

<https://www.worldometers.info/coronavirus/#countries>



<https://coronavirus.jhu.edu/map.html>

## Clinical

- Minimize risk
  - Patients
  - Employees
- Maintain quality care
  - Prioritize and maintain clinical services
  - Identify clinical alternatives that minimize the use of resources
  - Modified clinical schedule
  - Options for physics coverage

## Clinical

- AAPM Professional Council recommendations
- Identifying minimum staffing models
- Identifying work schedules considering staff needs
- Awareness of regulatory or accreditation requirements
- Ensuring resources for off-site work
- Timing of tasks



## Clinical

- COMP recommendations
  - Prioritizing
  - Collaborating
  - Protecting
  - Innovating
  - Sharing



## Clinical

- Facility access
  - “Essential employees”
    - Contract medical physicists, service engineers, applications trainers
- CISA guidance
- AAPM essential workers letter



**U.S. Department of Homeland Security**  
Cybersecurity & Infrastructure Security Agency  
*Office of the Director*  
Washington, DC 20528

**ADVISORY MEMORANDUM ON IDENTIFICATION OF ESSENTIAL CRITICAL  
INFRASTRUCTURE WORKERS DURING COVID-19 RESPONSE**



## Regulatory and Accreditation

- Limited staffing and site access required enforcement modifications
  - ACR
  - TJC
  - NRC
  - ADCL
  - USDA
- CRCPD
  - Guidance to U.S. state regulatory bodies

## Education

- Training programs (graduate, residency, post-doctoral)
  - Didactics
  - Research
  - Defenses
- SDAMPP, CAMPEP, AAPM Education Council guidance letters
  - Residency Program Directors
  - Graduate Program Directors



## Education

- CAMPEP certification activities
  - No on-site reviews
  - Program Director discretion
- ABR certification
  - Exam schedules altered
- CCPM membership examination
  - Membership oral exam delayed and moved online
  - Fellowship candidate exams moved online



## Research

- AAPM Science Council guidance letter
  - Clinical trials and clinical research
  - Planning to maintain research capacity while transitioning as much research effort as possible to remote work
  - Operational access to appropriate equipment and data during the pandemic
  - Coordination with research sponsors
  - New opportunities for medical physics research created by the pandemic



## Research

- Research entity accommodations
  - Allowances and extensions
  - Unbudgeted research expenses
  - Rapidly changing
- New research opportunities
  - Imaging
  - Therapy

## Research

- Early lack of laboratory tests
  - Imaging diagnostic trials
- MIDRC initiative (NIBIB)
  - Lead by Maryellen Giger, PhD
  - Open-source image database for COVID-19 research
    - Joint effort of AAPM, ACR, RSNA
  - Development and validation of AI to enable early detection based on COVID-19 imaging biomarkers
  - Potential future applications for other conditions

## Research

- Therapy
  - Low-dose treatment for inflammatory conditions
  - Potential reduction of acute respiratory distress

## Conclusions

- COVID-19 had an unprecedented impact
  - Positive
  - Negative
- Improved efficiency
  - Clinical operations
  - Education, training, certification
- New directions for medical physics research



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