Welcome, we will begin shortly

- The audio should automatically connect through your computer.
- If you can't listen through your computer, please connect to the audio portion by phone:

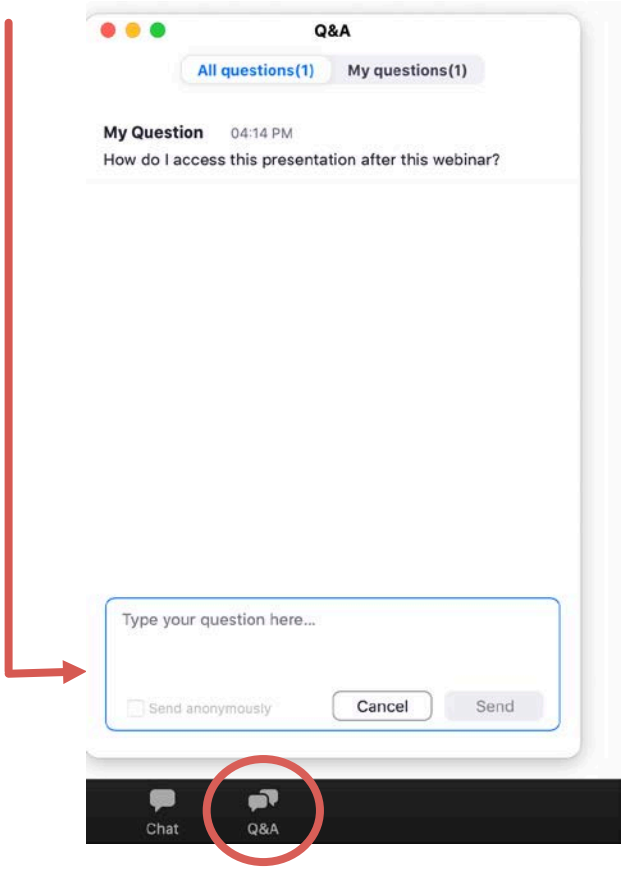
Phone	(877) 853-5247
Webinar/Meeting ID	999 2177 9049
Password	884106

FAQs

- Slides advance automatically
- Presentation is posted at paradigmcorp.com/webinars
- No live Q&A, questions will be answered via email after the webinar
- Link to replay will be emailed
- If you experience computer audio broadcast problems, please use the dial-in number:

(877) 853-5247
Webinar/Meeting ID: 999 2177 9049
Password: 884106

- Submit questions at any time
- Q&A panel is on the menu bar at the bottom of your Zoom screen
- Type question into lower section of Q&A panel.



How to receive CE credits

This live webinar has been approved for one hour of continuing education (CE) credit. The following credits have been approved:

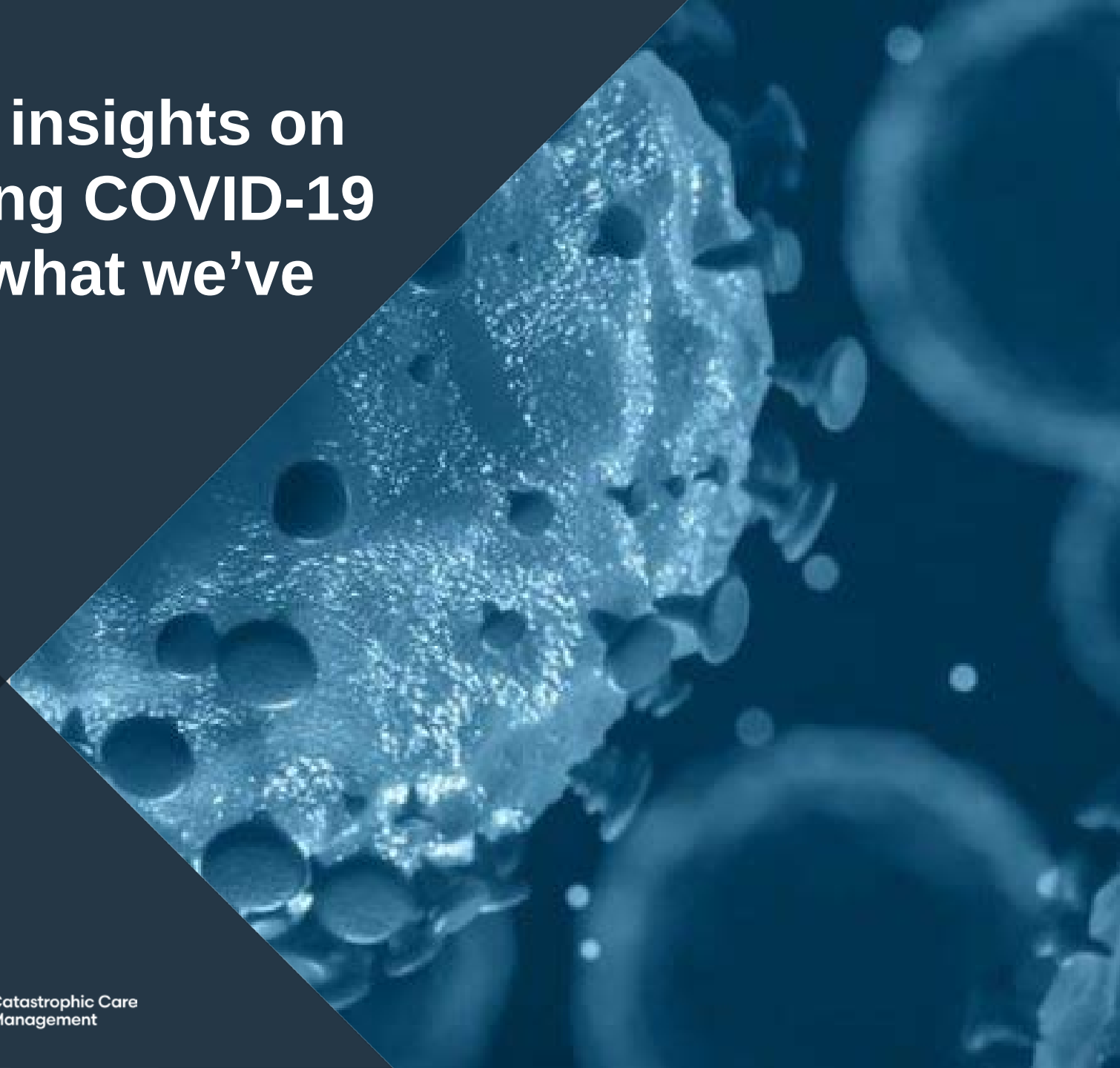
- CEU adjuster credits
  - AK, AL, AR, CA, DE, FL, GA, ID, IN, KY, LA, MN, MS, MT, NC, NH (WC & Multi), NM, NV, OK, OR, TX, UT, WY
- CE for national nurse credit
- CCMC national credit

How to receive credit:

- Attend the entire live webinar
- Five poll questions will pop up during the webinar. **You must respond to at least three polls to receive credit.**
- After the webinar, you will receive an email from ceuinstitute.net with a credit submission link and an evaluation that will **need to be completed to receive credit**.

Note: CE credit will not be provided for webinar replay.

Clinical insights on managing COVID-19 cases: what we've learned



Paradigm | Catastrophic Care Management

Today’s speakers

Michael Choo, MD, MBA, FACEP, FAAEM, CMRO
Chief Medical Officer
Paradigm

Kathy Galia, RN, BSN
Chief Operating Officer, Paradigm
Catastrophic Care Management

Lawrence Lottenberg, MD, FACS
Medical Director
Paradigm Catastrophic Care Management

Joseph K. Choo, MD, FACC
Paradigm Medical Specialist Consultant
Interventional Cardiologist
Medical Director of Structural Heart and Valve Center, Christ Hospital

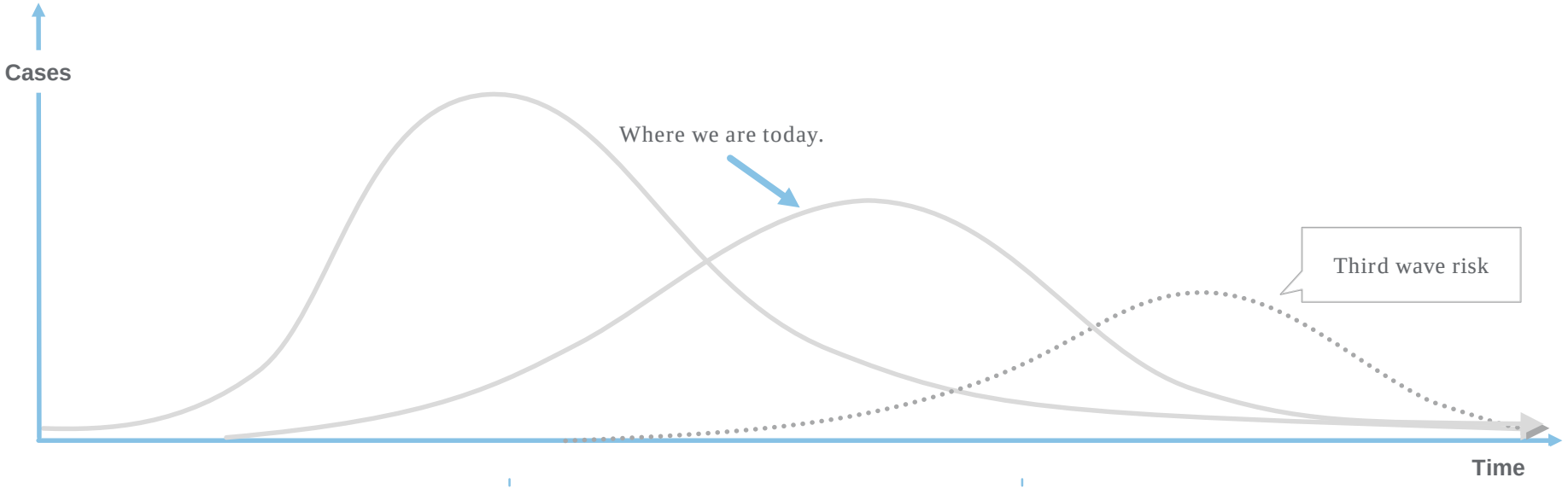
Tiffany Morvari, MA, LPCC
Director of Clinical Programming
AiRCare Health

Objectives

- Recap COVID-19 “basics” and understand the ever-changing societal impact
- Evaluate clinical manifestations and complications of those patients with mild/moderate/severe symptoms
- Discuss emerging treatment—distinguish fact from fiction
- Explore the interplay of COVID-19 and behavioral health
- Understand the recovery and rehabilitation process—sharing our experiences
- Provide better clinical perspectives to address the injured workers we serve and better understand our financial liabilities

Our nation faces one of the great challenges of our generation

Managing the spread and mortality associated with COVID-19



Emerging

- Initial cases identified
- Community spread begins
- No disruption to health care system
- Providers still accessible
- No impact on worker's comp claims

Rapid escalation

- Rapid growth in positive cases
- Severe access to care challenges
- Delivery through non-traditional sites of care
- Contraction in medical supply chain
- Evolving coverage positions for work related COVID-19 claims

Undulating recovery

- Case frequency lessens with each wave
- More testing, surveillance, and return to work protocols
- Health care system and access adjusting to new environment
- Recovery and management of severe COVID-19 claims ongoing

What is novel about Coronavirus (COVID-19)?

- Newly mutated Coronavirus
  - Two different types—L and S
  - New mutation
- Asymptomatic and pre-symptomatic carrier states
- Multi-organ disease condition
  - Cells with angiotensin-converting enzyme 2 (ACE-2) receptors
  - Cytokine storm
- Vaccine status
  - None currently available
  - Warp speed vaccine development

Epidemiology

Graphic distribution

- Above 16 million confirmed cases of COVID-19 globally with over 650K deaths
- US total cases with 4.29M and over 148K deaths
- Cases steadily rising in many countries with US still accounting for 25% of cases

Route of transmission

- Respiratory droplet
- Direct contact
- Animals

Period of infectivity

- Due to extended incubation period, high rate of transmission
  - 2-27 days incubation after exposure with an average of 5 days
- The duration of viral shedding is variable but seems more “front loaded”
- Asymptomatic transmission documented and confirmed

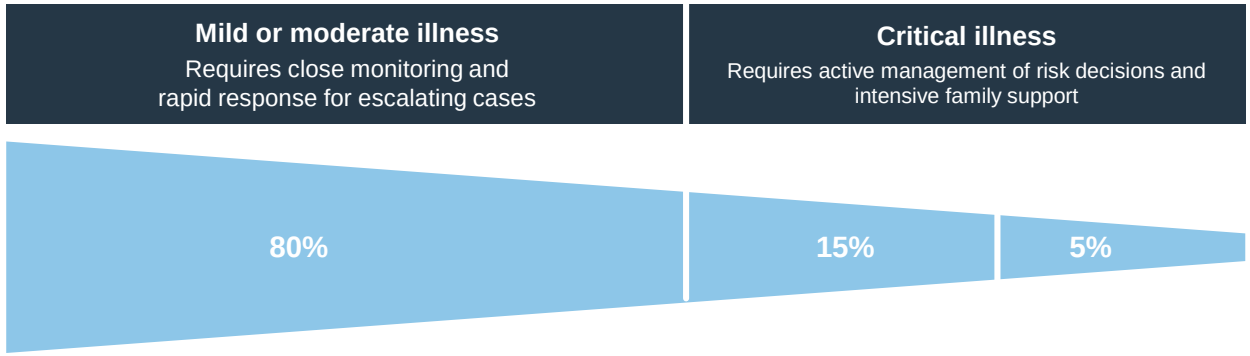
Immunity

- Preliminary evidence suggests that virus induced antibodies are protective in short term
- Further research is needed to determine long term immunity

The 80/20 rule and COVID-19

20% of COVID cases involve a critical illness requiring specialized expertise to address complex risk decisions and challenges

COVID-19 severity profile
(% of cases)



Care requirements

- Ambulatory care
- Hospitalization
- Intensive care
- Invasive ventilation

Symptoms, problems and risks

- Fever
- Cough
- Headache
- Shortness of breath
- Sepsis
- Acute Respiratory Distress Syndrome (ARDS)
- Behavioral health challenges
- Acute cardiac injury
- Acute kidney injury
- Secondary infection
- Post-intensive care syndrome

Sources: Wu et al (2020), The Lancet DOI: (10.1016/S0140-6736(20)30793-5); Clinical Courses of Major Symptoms and Outcomes and Duration of Viral Shedding [from Zhou, et al.; Lancet (2020)]

Clinical features

Impact of age

Individuals of any age can acquire COVID-19

- Adults of middle age and older are most commonly affected
  - Median age remains 49 to 56 years
- Older adults
  - Severe disease
  - Increased mortality
- Symptomatic infection in children less common
  - Rarely seen critical complications in juveniles
    - Multisystem Inflammatory Syndrome

Clinical features

Risk factors for complications

Severe illness is most predominant in adults with **advanced age or underlying medical comorbidities**

Might be a risk:

Smoking?

Pregnancy?

Hypertension?

Asthma?

Cerebrovascular disease?

Cystic fibrosis?

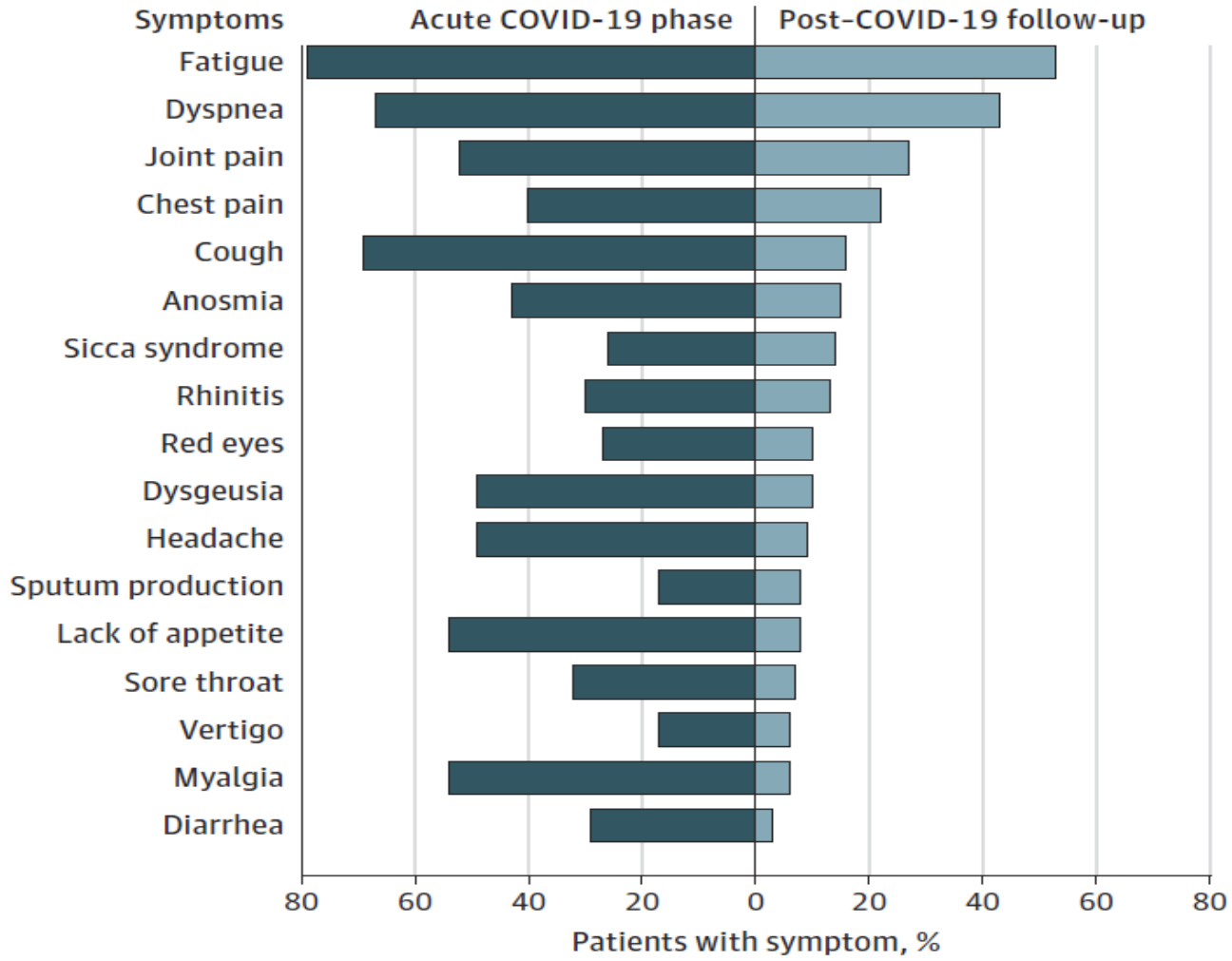
Comorbidities associated with severe illness and mortality
Cardiovascular disease—(heart failure, CAD, cardiomyopathy)
Diabetes mellitus
COPD
Obesity (BMI > 30 +)
Chronic kidney disease
Sickle cell disease
Immunocompromised states (organ transplant, HIV)
Children with neurologic, genetic, metabolic conditions including congenital heart disease

Diagnostic testing for COVID-19

- Testing methods
  - Viral antigen testing—diagnosing acute infection
    - Reverse transcription polymerase chain reaction (rT-PCR)–viral genetic molecules
    - Viral protein testing—rapid
  - Serology antibody testing—diagnosing past infection
- Caveats
  - False negatives
  - False positives
- Availability of tests

Clinical symptoms of Coronavirus (COVID-19)

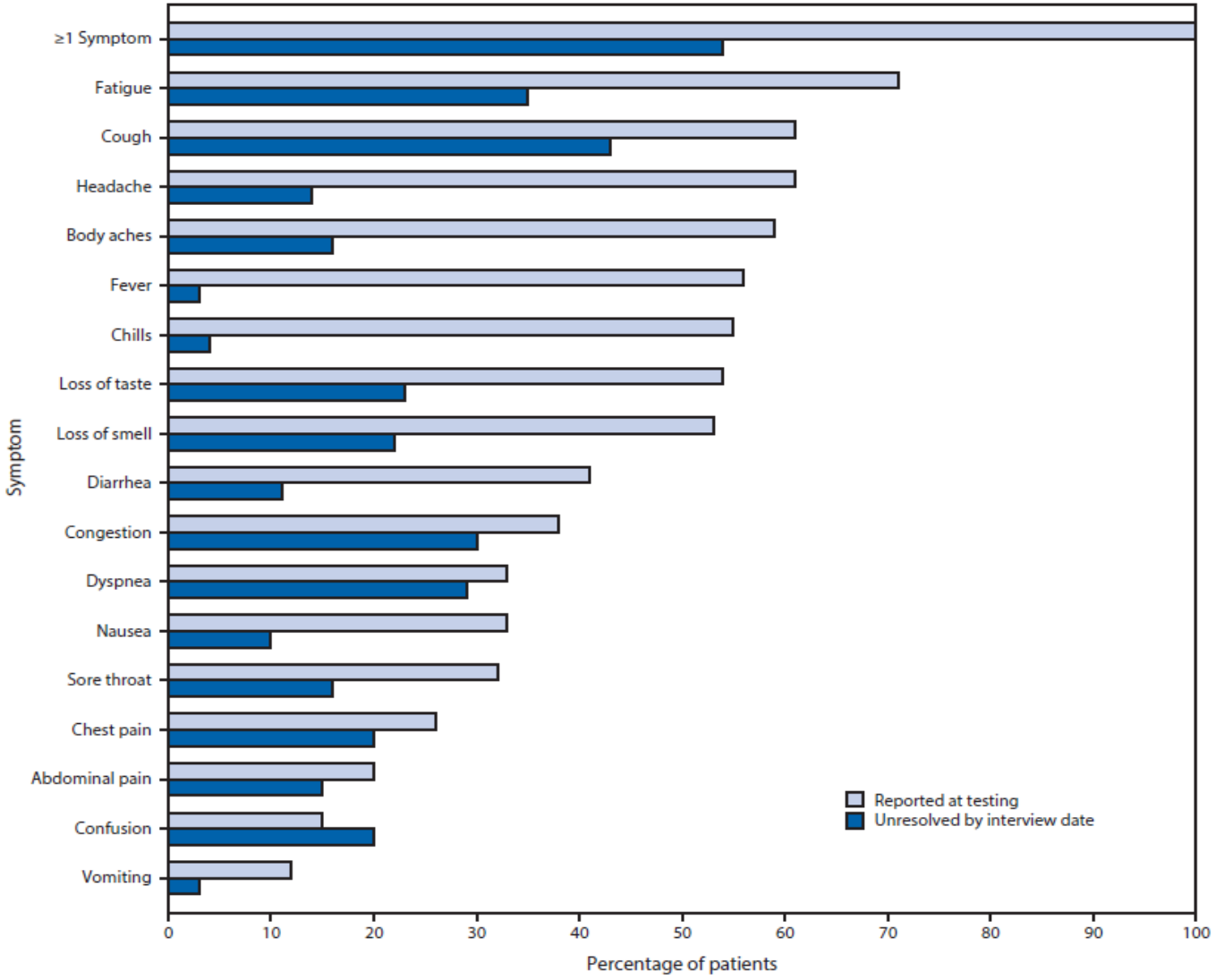
Hospitalized patient study



Published Online: July 9, 2020. doi:10.1001/jama.2020.12603

Clinical symptoms of Coronavirus (COVID-19)

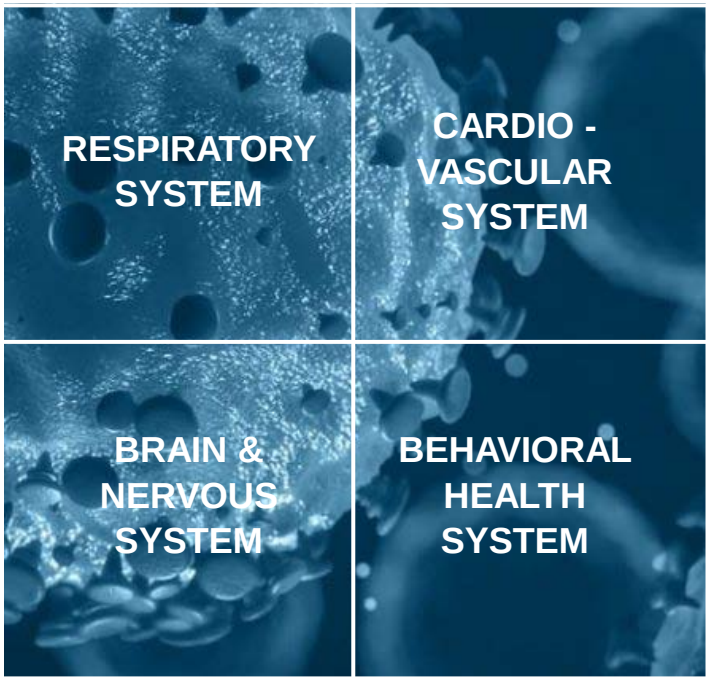
Mild-moderate outpatient study—self reported unresolved symptoms in patients 14-21 days post



Source: CDC: morbidity & mortality weekly report July 24, 2020

COVID-19 risks—what we know now

The most severe cases involve a set of clinical challenges that are also prevalent in the management of catastrophic injuries



Clinical manifestations

Course and complications

Laboratory findings

- White blood cell count can vary
- High D-dimer levels
- Severe lymphopenia

Evidence of an exuberant inflammatory response

- Persistent fevers
- Elevated inflammatory markers
- Elevated proinflammatory cytokines

Pneumonia

- Fever
- Cough
- Dyspnea
- Bilateral infiltrates on chest imaging

Imaging findings

- Chest CT
  - Commonly demonstrates ground-glass opacification consistent with viral pneumonia

Emerging treatment approaches

Remdesivir

- A novel nucleotide analogue that has activity against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in vitro and related coronaviruses both in vitro and in animal studies

Steroids

- Dexamethasone

Anticoagulation

- Heparin

IL-6 pathway inhibitors

- In cases having elevated IL-6 levels; tocilizumab, sarilumab, and siltuximab are being evaluated

Convalescent plasma

- Patients had decreased nasopharyngeal viral load, decreased disease severity score, and improved oxygenation by 12 days after transfusion

Favipiravir

- Use was associated with faster rates of viral clearance and more frequent radiographic improvement compared with lopinavir-ritonavir

Pulmonary complications

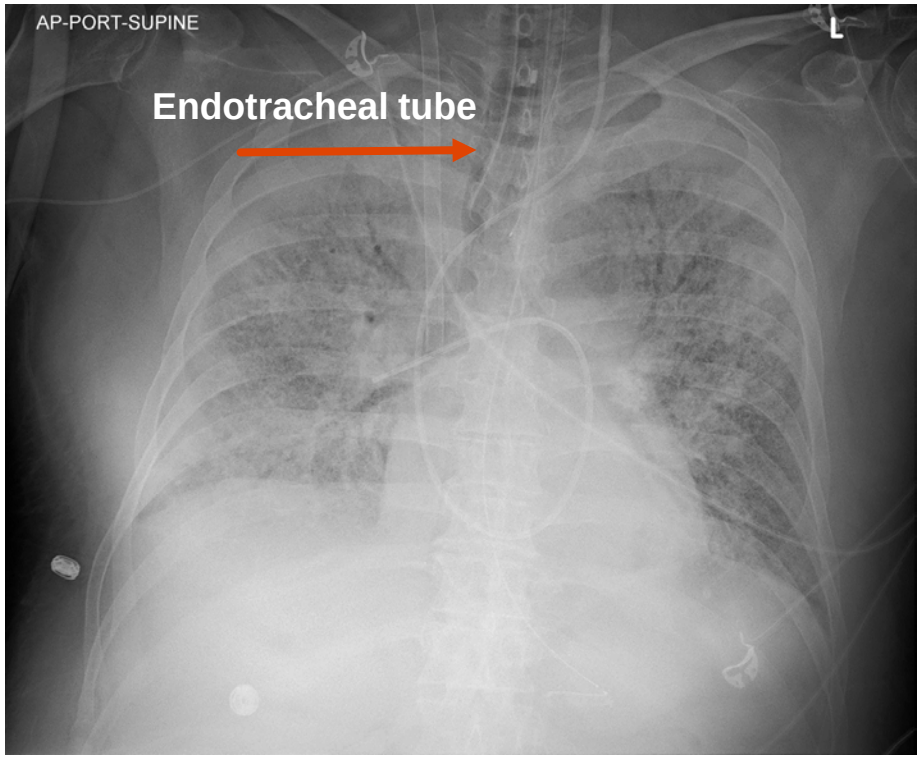
Acute Respiratory Distress Syndrome (ARDS)

- Severe bilateral lung injury
- Extended ventilator support

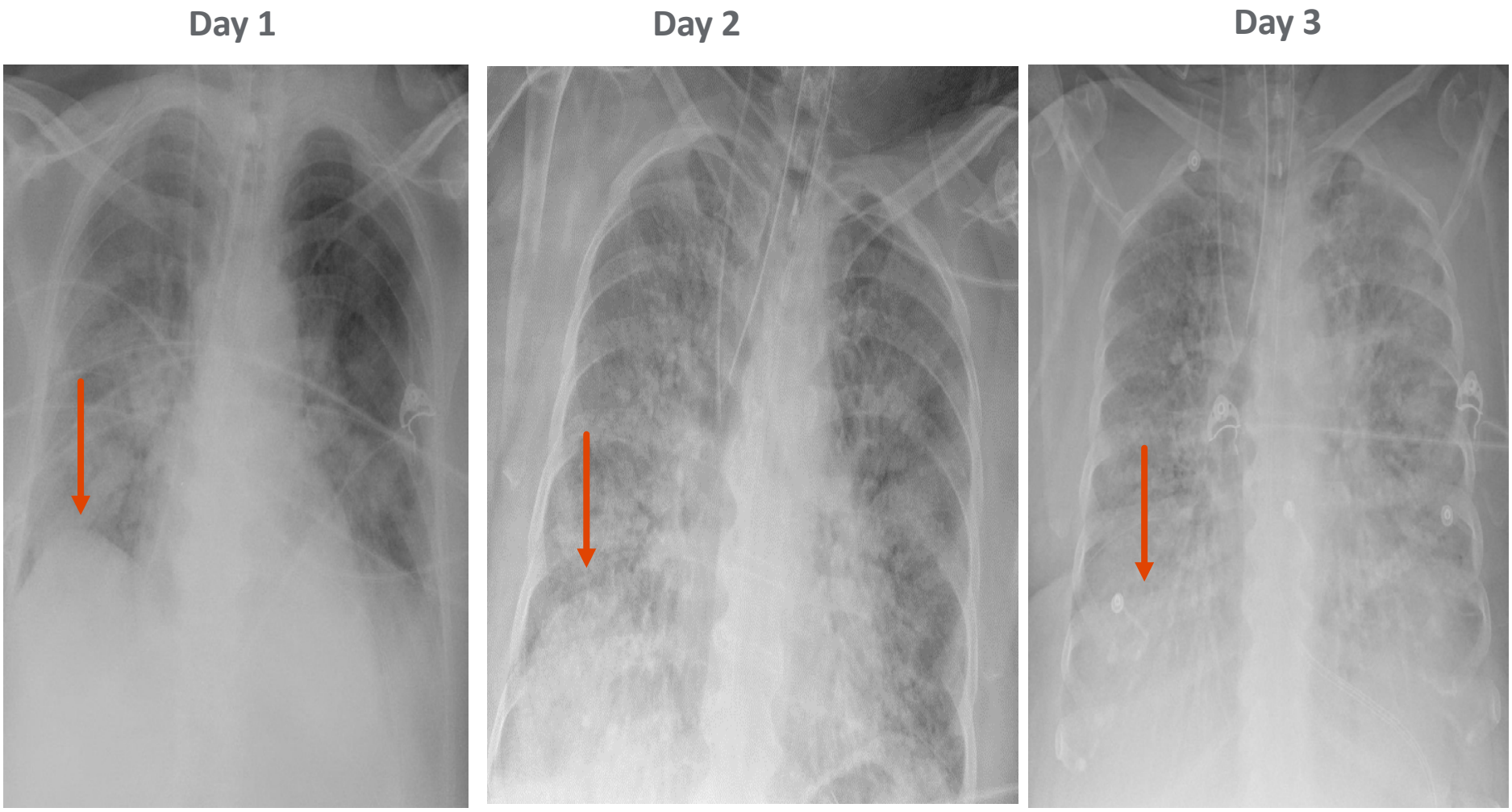
Respiratory issues

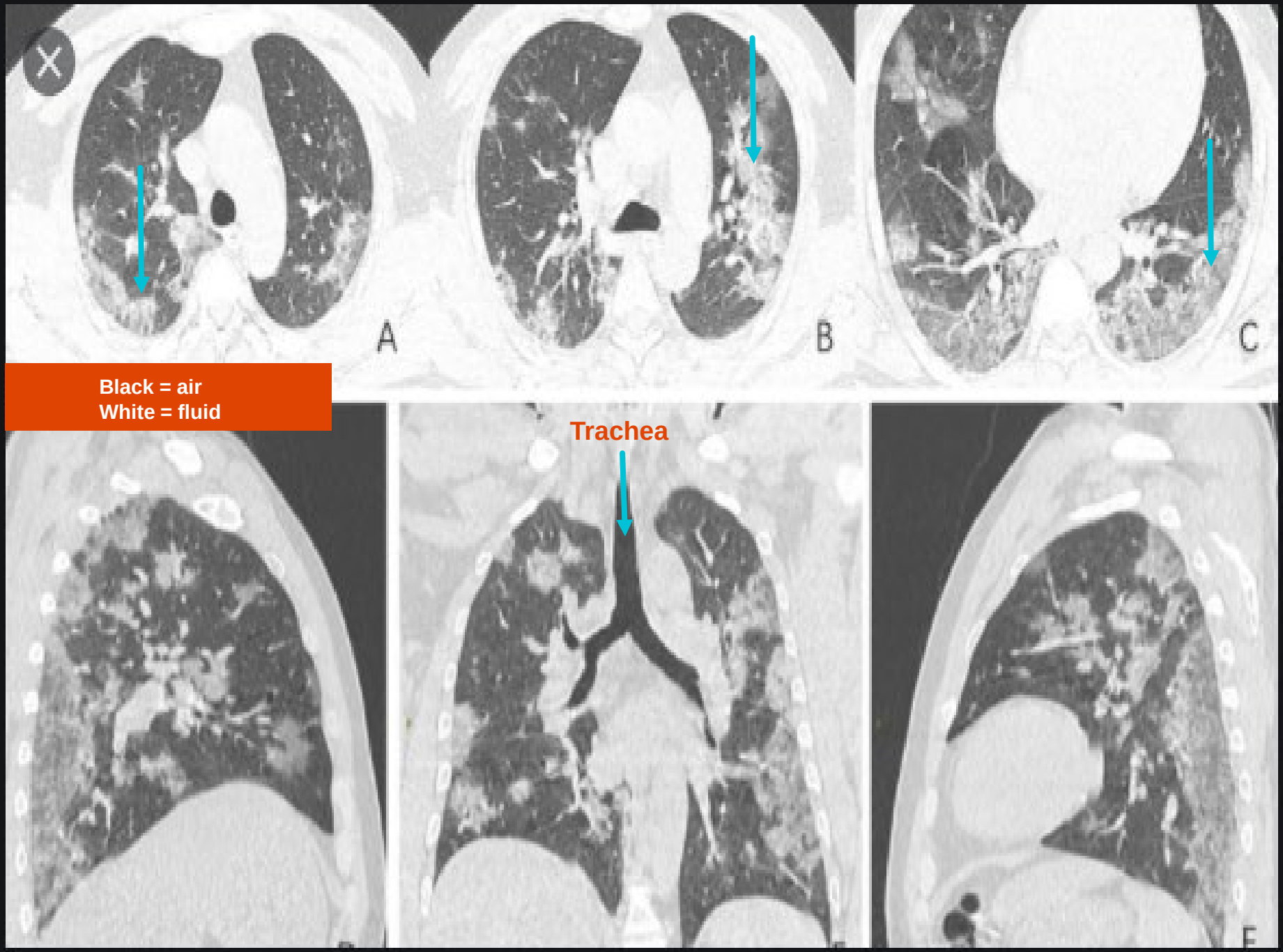
- Mechanical ventilation
- Prone ventilation
- Tracheostomy

Long-term complications of ARDS



COVID-19—rapidly progressive ARDS




A
B
C
Black = air
White = fluid
Trachea
F

Clinical course

- Hypoxemia
- Bilateral alveolar infiltrates
- Diffuse crackles
- Change to coarser reticular pattern of lung infiltration
  - Persistent hypoxemia
  - Low lung compliance
  - High dead space
  - Progressive pulmonary hypertension
- Possible ventilator dependence
- Possible residual deficits
  - Lung function
  - Cognitive
  - Emotional
  - Physical
- Extended phase

COVID recovery

Post-intensive care

- **Post-ICU re-hospitalization and ongoing medical care**
  - >40% preventable with improved access to ambulatory follow-up care
- **Long term survival**
  - Increased risk of death in first three to six months after ICU admission
  - Likely related to pre-existing illnesses
  - ICU survivors—higher three and five year mortality
- **Post COVID pulmonary compromise**
  - Issues with return to work
  - New findings

A vaccine solution?

Adenovirus vector	Messenger RNA	Nanoparticles
Oxford U-AstraZeneca	Moderna	Novavax
Johnson & Johnson	BioNTech-Pfizer	

Caveats:

- Two inoculations may be necessary
- Neutralizing antibodies may not prevent infection
- Duration of immunity unknown/may wane
- Side effects/unanticipated effects

Cardiovascular complications

Early heart-related issues

- Myocarditis
- Coronary syndromes
- “STEMI” mimics—small vessel thrombosis (“clots”)
- Congestive heart failure/pump failure
- Arrhythmias

Treatments for COVID-19 cardiovascular issues

- Critical care interventions
  - ECMO—extracorporeal membrane oxygenation
- Pharmacological interventions

Near-term & long-term cardiovascular complications

- Delayed pericarditis & myocarditis
- Long-term scar/fibrosis and increased risk for chronic heart failure

COVID-19 impact on the heart

- **Direct**
  - 1/3 of hospitalized COVID patients show biomarker evidence of injury
  - Biomarker evidence of cardiac injury is associated with mortality rates of up to 40-50% in COVID-19 patients
  - In COVID-19 hospitalized patients who survive, convalescent cardiac MRI and echo surveillance reveals evidence of scar and permanent myocardial injury in up to 50-70%
- **Non-direct**
  - Implications for cardiac care and prognosis from delays in treatment due to fear of COVID-19

Cardiovascular implications of COVID-19—delays in treatment

Then

- Reduced caseload of MI patients
- Delays in presentation
- Increased sudden death in field
- Reduced office visits/follow-up care

Now

- Increased CHF admission/severity
- Increased CVICU acuity

Neurological and post-ICU complications

- **Neurological manifestation similar to acquired brain injury**
  - Encephalitis & seizures
  - Stroke complications
- **Post-intensive Care Syndrome (PICS)**
  - Cognitive impairment
    - Vast majority with memory, mental processing, attention, concentration issues
    - Similar to moderate TBI or traumatic brain injury cases
  - Severe physical damage
    - Critical care polyneuropathy
    - Muscle atrophy and weakness
  - Psychological dysfunction
    - Anxiety, depression, and PTSD

Behavioral health complications

Family/community suffer from:

- Forced isolation and reduced contact with the injured worker
- Loss of injured worker as family leader
- PTSD, anxiety, and depression
- Loss of control over their daily lives
- Psychosocial impacts on injured workers and their families

The impact of recovery from COVID-19 for injured workers and their families and ways to manage:

- Emotional recovery from COVID-19
- Becoming a caregiver
- New anxieties and fears

All clear

Discontinuation of transmission based precautions

Symptom based

With mild to moderate illness:

- At least 24 hours since resolution of fever without fever-reducing medications AND
- Improvement of respiratory symptoms (cough, shortness of breath) AND
- At least **10 days** since symptoms first appeared

With severe and critical illness or immunocompromised states:

- At least 24 hours since resolution of fever without fever-reducing medications AND
- Improvement of respiratory symptoms (cough, shortness of breath) AND
- At least **20 days** since symptoms first appeared

Test based

All of the above, plus:

- Negative result of two FDA authorized COVID-19 molecular assay (respiratory specimens) collected >24 hours apart
- Patients with lab confirmed COVID-19 who have not had any symptoms should proceed with transmission precautions for 10 days, assuming they remain symptom free

The journey through rehab and recovery

What we've learned

- Specialized recovery and rehabilitation units opening country-wide
- Admission criteria
- Interdisciplinary teams
- Leveraging technology and tele-med
- Discharge to home
- Cost variations

Replay, Questions and CE Credits

Replay and questions

- A link to the replay will be sent via email and posted to paradigmcorp.com/webinars
- If you have any questions post-webinar, you may submit them to webinars@paradigmcorp.com
- Questions will be answered via an emailed FAQ document

How to receive CE credits

This live webinar has been approved for one hour of continuing education (CE) credit. The following credits have been approved:

- CEU adjuster credits
  - AK, AL, AR, CA, DE, FL, GA, ID, IN, KY, LA, MN, MS, MT, NC, NH (WC & Multi), NM, NV, OK, OR, TX, UT, WY
- CE for national nurse credit
- CCMC national credit

How to receive credit:

- Attend the entire live webinar
- Five poll questions will pop up during the webinar. **You must respond to at least three polls to receive credit.**
- After the webinar, you will receive an email with a credit submission link and an evaluation that will **need to be completed to receive credit**.

Note: CE credit will not be provided for webinar replay.

Thank you

webinars@paradigmcorp.com

Paradigm | Catastrophic Care Management