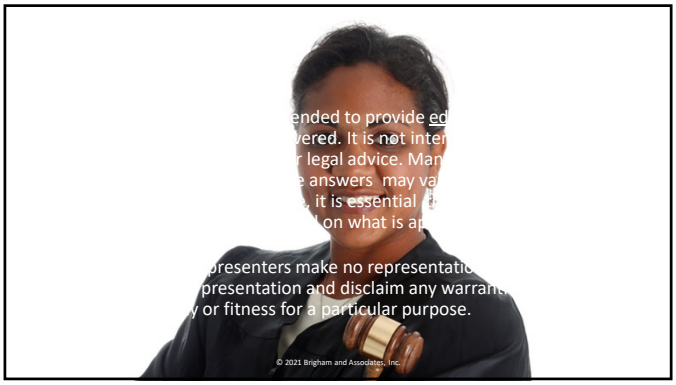
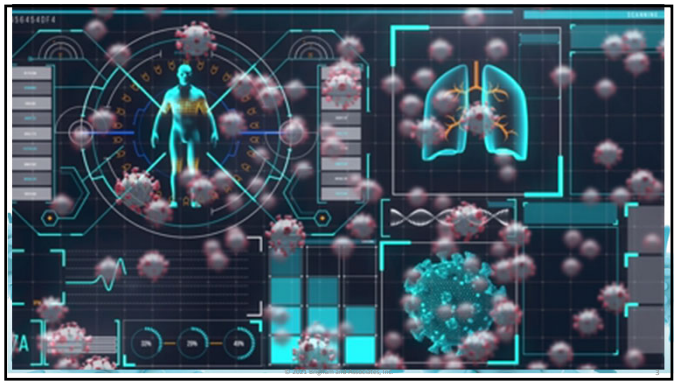
1

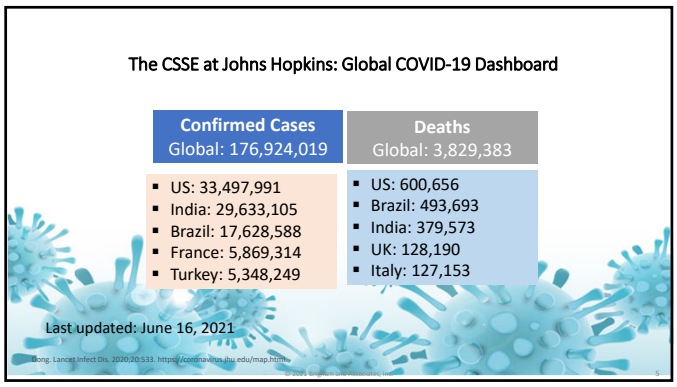


2

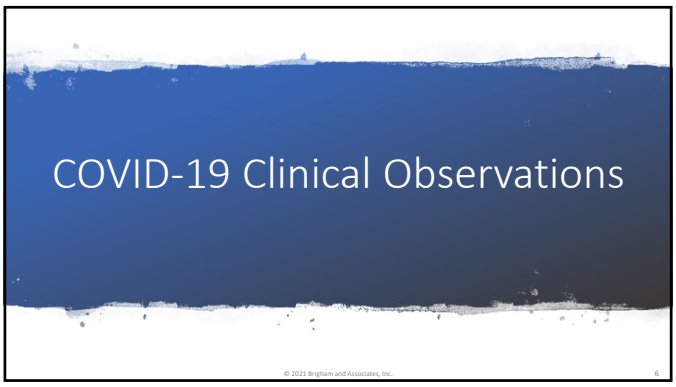


3

4

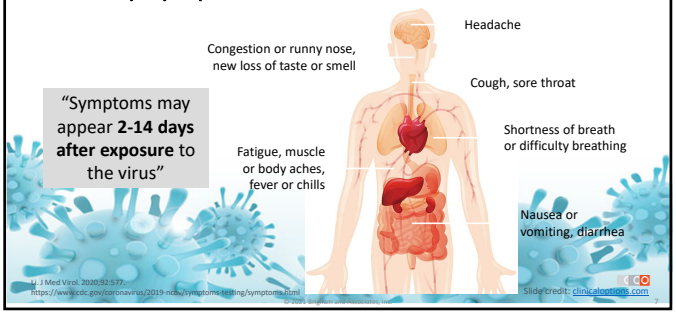


5



6

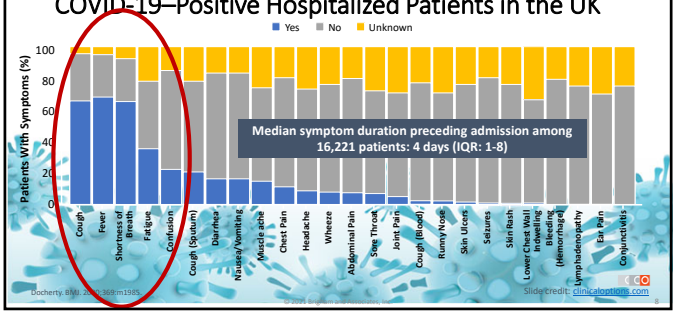
Primary Symptoms of COVID-19



J Med Virol. 2020;92:577. https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html
Slide credit: clinicaloptions.com

7

Frequency of Presenting Symptoms Among COVID-19–Positive Hospitalized Patients in the UK



Docherty. BMJ. 2020;369:m1985.
Slide credit: clinicaloptions.com

8

Acute Complications of COVID-19

- Neuropsychiatric
  - Cerebrovascular accident
  - Large vessel disease
  - Encephalopathy, delirium
  - Anosmia, ageusia
- Respiratory
  - Pneumonia
  - Hypoxemic respiratory failure, ARDS
- Cardiovascular
  - Arrhythmia
  - Myocarditis
- Hematologic
  - Coagulopathy
  - Thrombotic events
- Renal
  - Acute Kidney injury
- Gastrointestinal, Hepatobiliary
  - Diarrhea
  - Acute liver injury
- Musculoskeletal
  - Rhabdomyolysis
- Dermatologic
  - Livedo reticularis
  - Maculopapular or urticarial rash

9

Pathophysiology of Acute COVID-19

Why are people ill?

- Direct viral toxicity
- Endothelial damage and microvascular injury
- Immune system dysregulation and stimulation of a hyperinflammatory state
- Hypercoagulability with resultant in situ thrombosis and macrothrombosis
- Maladaptation of the angiotensin-converting enzyme 2 (ACE2) pathway

Credit: Nalbandian, A., Sehgal, K., Gupta, A. *et al.* Post-acute COVID-19 syndrome. *Nat Med* (2021). https://doi.org/10.1038/s41591-021-01283-z

10

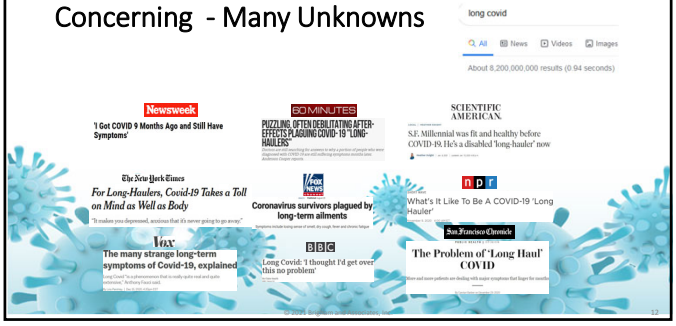
Predicting Delayed Return to Usual Health Among COVID-19 Outpatients in the United States

Characteristic, n (% of Subgroup)			Returned to Usual Health Within 14-21 Days of Positive SARS-CoV-2 RT-PCR		*P* Value
			Yes (n = 175)	No (n = 95)	
Age	▪ 18-34 yrs	(n = 85)	63 (74)	22 (26)	.010
	▪ 35-49 yrs	(n = 96)	65 (68)	31 (32)	
	▪ ≥ 50 yrs	(n = 89)	47 (53)	42 (47)	
Number of medical conditions	▪ 0	(n = 123)	87 (71)	36 (29)	.003
	▪ 1	(n = 57)	41 (72)	16 (28)	
	▪ 2	(n = 39)	21 (54)	18 (46)	
	▪ ≥ 3	(n = 44)	19 (43)	25 (57)	
Individual medical conditions	▪ Hypertension	(n = 64)	33 (52)	31 (48)	.018
	▪ Obesity (ie, BMI > 30)	(n = 51)	23 (45)	28 (55)	.002
	▪ Psychiatric condition	(n = 49)	23 (47)	26 (53)	.007
	▪ Immunosuppressive condition	(n = 15)	6 (40)	9 (60)	.047

Tenforde. MMWR Morb Mortal Wkly Rep. 2020;69:993.

11

Long-term COVID-19 Symptoms and Sequelae Concerning - Many Unknowns



12

CDC Updated Guidance – June 14, 2021

Evaluating and Caring for Patients with Post-COVID Conditions: Interim Guidance

Updated June 14, 2021 Print

This content is a more detailed version of the Post-COVID Conditions: Information for Healthcare Providers page. This page is also distinct from the Post-COVID Conditions webpage which is intended for the general public.

Table of Contents

› Key Points	Assessment and Testing
Background	Management of Post-COVID Conditions
General Clinical Considerations	Public Health Recommendations
Patient History and Physical Exam	Future Directions and Resources

13

CDC Key Points

- The term "Post-COVID Conditions" is an **umbrella term** for **the wide range of physical and mental health consequences** experienced by some patients that are present **four or more weeks after SARS-CoV-2** infection, including by patients who had initial mild or asymptomatic acute infection.
- Based on current information, many post-COVID conditions can be **managed by primary care providers**, with the incorporation of patient-centered approaches to **optimize the quality of life and function in affected patients.**

14

CDC Key Points

- **Objective laboratory or imaging findings should not be** used as the only measure or assessment of a patient's well-being; **lack of laboratory or imaging abnormalities does not invalidate the existence, severity, or importance of a patient's symptoms or conditions.**

15

CDC Key Points

- Healthcare professionals and patients are encouraged to set achievable goals through **shared decision-making** and to approach treatment by focusing on specific symptoms (e.g., headache) or conditions (e.g., dysautonomia); a comprehensive management plan focusing on improving physical, mental, and social wellbeing may be helpful for some patients.
- **Understanding of post-COVID conditions remains incomplete and guidance** for healthcare professionals will likely change over time as the evidence evolves.

16

Symptoms commonly reported among people with post-COVID conditions (CDC)

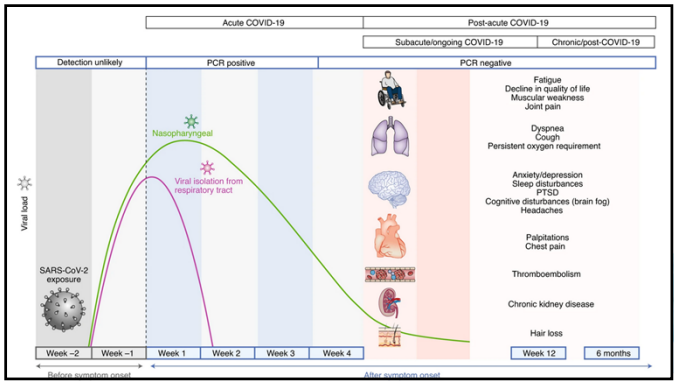
- Dyspnea or increased respiratory effort
- Fatigue
- Post-exertional malaise and/or poor endurance
- "Brain fog," cognitive impairment
- Cough
- Chest pain
- Headache
- Palpitations and/or tachycardia
- Arthralgia
- Myalgia
- Paresthesia
- Abdominal pain
- Diarrhea
- Insomnia and other sleep difficulties
- Fever
- Lightheadedness
- Impaired daily function and mobility
- Pain
- Rash (e.g., urticaria)
- Mood changes
- Anosmia or dysgeusia
- Menstrual cycle irregularities

17

Post-COVID Symptoms, Sequelae

- Neuropsychiatric
  - Neurocognitive deficits
  - Mood changes
  - Sensory & motor deficits
  - Chronic fatigue and sleep disruption
- Respiratory
  - Persistent dyspnea
  - Chronic cough
- Cardiovascular
  - Chest pain
  - Palpitations
- Hematologic, Vascular
  - Persistent or recurrent thrombosis
- Renal
  - Chronic kidney disease
- Gastrointestinal, Hepatobiliary
  - Persistent liver dysfunction
- Musculoskeletal
  - Muscle wasting
  - Weakness
  - Deconditioning
- Dermatologic
  - Hair Loss

18



19

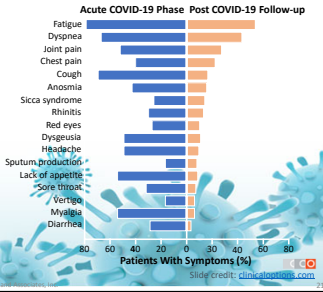
Michigan Study

- Outcomes of 1,250 patients discharged from 38 hospitals
- Observational study with contact at 60 days
- 6.7% died
- 15.1% readmitted
- Of 488 patients who completed the survey,
  - 32.6% persistent symptoms
  - 22.9% with dyspnea
  - 15.4% cough

20

COVID-19 Symptom Persistence: Experience From Italy

- Postacute outpatient service for patients who recovered from COVID-19 (N = 143)
  - Mean hospital stay: 13.5 days
- Assessed by standardized questionnaire at mean of 60.3 days after onset of first COVID-19–related symptom
  - **32% had 1-2 persistent symptoms**
  - **55% had ≥ 3 persistent symptoms**
  - None with fever, signs of acute illness
- **44% of patients reported lower QoL**

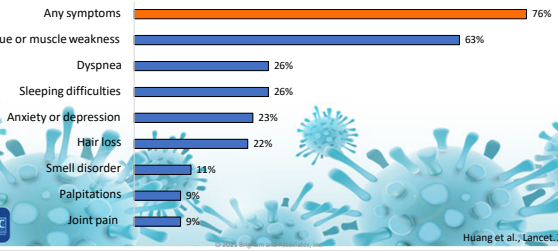


Carfì. JAMA. 2020;324:603.
Slide credit: clinicaloptions.com

21

Three quarters of patients hospitalized with COVID-19 had at least one ongoing symptom 6 months after their acute illness.

Symptoms among 1,733 patients after hospitalization for COVID-19, China



Huang et al., Lancet. 2021

22

Prolonged symptoms are common among patients with mild COVID-19 disease not requiring hospitalization.

- Survey of patients in a post-COVID 19 clinic in France[1] and telephone surveys in the Faroe islands[2] and Switzerland[3]
  - 35-54% of patients with mild acute COVID-19 had **persistent symptoms after 2-4 months**
  - 50-76% of patients **reported new symptoms** not present in their acute COVID-19 illness **or symptoms that resolved and reappeared**[1]
  - 9% reported prolonged symptoms as **severe**[2]

1. Salmon-Ceron et al., J Infect. 2020
2. Petersen et al., Clin Infect Dis. 2020
3. Nehme et al., Ann Intern Med. 2020

13

23

Pathophysiology of sequelae of COVID-19

Why are people still ill?

- Cellular damage
- Robust innate immune response with inflammatory cytokine production
- Pro-coagulant state induced by SARS-CoV02
- Not yet clear

Credit: Nalbandian, A., Sehgal, K., Gupta, A. *et al.* Post-acute COVID-19 syndrome. *Nat Med* (2021). https://doi.org/10.1038/s41591-021-01283-z

24

Probing Long-term Sequelae of COVID-19

- Limited peer-reviewed data focused on the occurrence, prevalence and duration of COVID-19–related long-term sequelae.
- Reasonable to anticipate manifestations based on established knowledge of SARS-CoV-2 pathophysiology, other coronavirus infection outcomes
  - Pulmonary, cardiovascular, and neurologic perturbations proposed
  - SARS-CoV-2 entry receptor ACE2 expressed across extrapulmonary tissues[1-3]
  - Among patients recovering from severe SARS-CoV or MERS-CoV infection, impaired diffusing capacity for carbon monoxide and exercise capacity common during first 6 mos following discharge; after 6 mos, posttraumatic stress disorder (39%), depression (33%), and anxiety (30%) still considerable[4].

1. Zhou. Nature. 2020;579:270. 2. Hoffmann. Cell. 2020;181:271.
3. Gupta. N Engl Med. 2020;16:1017. 4. Ahmed. J Rehabil Med. 2020;52:jrm00063.

Slide credit: clinicaloptions.com

25

System-based conditions reported following SARS-CoV2 infection (CDC)

Body System	Conditions (subject to change and not mutually exclusive)
Cardiovascular	Myocarditis, heart failure, pericarditis, orthostatic intolerance (e.g., postural orthostatic tachycardia syndrome (POTS))
Pulmonary	Interstitial lung disease, reactive airway disease
Renal	Chronic kidney disease
Dermatologic	Alopecia
Rheumatologic	Reactive arthritis, fibromyalgia, connective tissue disease
Endocrine	Diabetes mellitus, hypothyroidism

26

System-based conditions reported following SARS-CoV2 infection (CDC)

Neurologic	Transient ischemic attack/stroke, olfactory and gustatory dysfunction, sleep dysregulation, altered cognition, memory impairment, headache, weakness, and neuropathy
Psychiatric	Depression, anxiety, and post-traumatic stress disorder (PTSD), psychosis
Hematologic	Pulmonary embolism, arterial thrombosis, venous thromboembolism, or other hypercoagulability
Urologic	Incontinence, sexual dysfunction
Other	Weight loss, dysautonomia, vitamin D deficiency, allergies and mast cell activation syndrome, reactivation of other viruses, pain syndromes, and progression of comorbid conditions

27

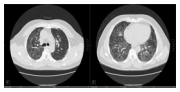
Risk Factors

- Diabetes
- Overweight – High BMI
- High Blood Pressure
- Immunologically Compromised
- Pulmonary Problems (Asthma)
- Ethnic Populations Risk bias.
- Blood Type A+ (?)
- Genetics
- Age

Credit: Based on presentation by John Floyd Esquire, Floyd Skeren Manukian Langevin LLP, and Nachman Brautbar, MD, March 19, 2021 CSMS

28

Pulmonary: Post-Acute COVID-19



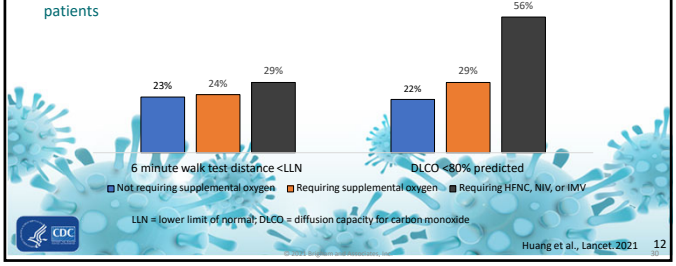
Dyspnea, decreased exercise capacity and hypoxia are commonly persistent symptoms and signs

Reduced diffusion capacity, restrictive pulmonary physiology, and ground-glass opacities and fibrotic changes on imaging have been noted at follow-up of COVID-19 survivors

29

One in five patients not requiring supplemental oxygen during hospitalization had decreased lung function after 6 months.

Pulmonary function and 6-minute walk test distance results among COVID-19 hospitalized patients

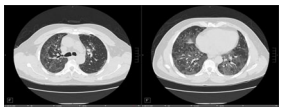


Huang et al., Lancet 2021

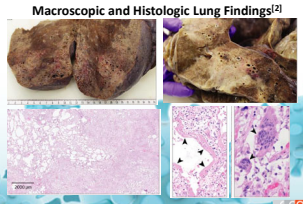
30

Pulmonary Sequelae

- Diffuse alveolar damage noted in multiple, small postmortem studies of COVID-19
  - N = 38 from northern Italy[1]
  - N = 10 from Germany[2]
- Platelet–fibrin thrombi indicative of coagulopathy observed in small arterial vessels of some patients[1]



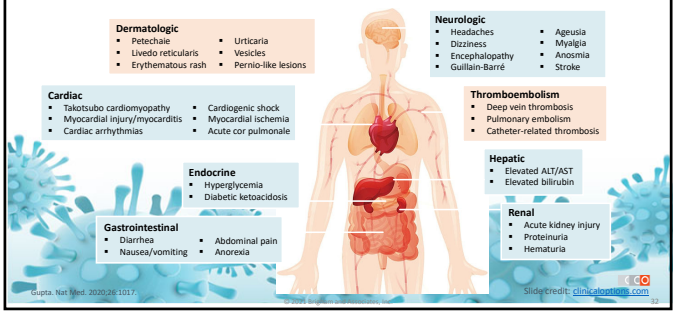
Macroscopic and Histologic Lung Findings[2]



1. Carsana. Lancet Infect Dis. 2020;20:1135. 2. Schaller. JAMA. 2020;323:2518.

Slide credit: clinicaloptions.com

Extrapulmonary Manifestations of COVID-19: Which of These Return or Last?



Gupta. Nat Rev Med. 2020;26:1017.

Slide credit: clinicaloptions.com

Cardiovascular: Post-Acute COVID-19

- Persistent symptoms may include palpitations, dyspnea and chest pain
- Long-term sequelae may include increased cardiometabolic demand, myocardial fibrosis or scarring (detectable via cardiac MRI), arrhythmias, tachycardia and autonomic dysfunction

Cardiovasular Sequelae

- Prospective, observational cohort study sourcing recovered patients from the University Hospital Frankfurt COVID-19 Registry (N = 100)[1]
  - CV magnetic resonance performed at median 71 days from diagnosis
  - **Abnormal findings in 78% of patients, myocardial inflammation in 60%; independent of preexisting comorbidities, severity of acute SARS-CoV-2 infection, and time from diagnosis**
  - Reduced left ventricular ejection fraction, increased left ventricle volumes and native T1/T2 vs risk-matched controls

"There are no data on how acute treatment of COVID-19 may affect . . . long-term cardiac recovery and function. Patients with ostensibly recovered cardiac function may still be at risk of cardiomyopathy and cardiac arrhythmias."[2]

1. Puntmann. JAMA Cardiol. 2020;[Epub]. 2. Mitrani. Heart Rhythm. 2020;[Epub].

Slide credit: clinicaloptions.com

Hematologic: Post-Acute COVID-19

Thromboembolic events have been noted to be <5% in post-acute COVID-19 in retrospective studies.

The duration of the hyperinflammatory state induced by infection with SARS-CoV-2 is unknown.

Neuropsychiatric: Post-Acute COVID-19

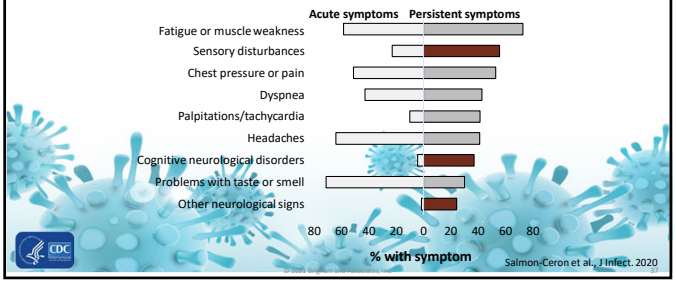
Persistent abnormalities may include fatigue, myalgia, headache, dysautonomia and cognitive impairment (brain fog)

Anxiety, depression, sleep disturbances and PTSD have been reported in 30–40% of COVID-19 survivors, similar to survivors of other pathogenic coronaviruses

The pathophysiology of neuropsychiatric complications is mechanistically diverse and entails immune dysregulation, inflammation, microvascular thrombosis, iatrogenic effects of medications and psychosocial impacts of infection

More than one quarter of patients developed new neurological symptoms after their acute COVID-19 illness.

COVID-19 symptoms among 70 non-hospitalized patients, France



Salmon-Ceron et al., J Infect. 2020

37

Neurologic Sequelae

Sensory Deficits: Olfactory and Gustatory Dysfunction

- Systematic review and meta-analysis including 24 studies of confirmed COVID-19 (N = 8438)[1]
  - Pooled prevalence
    - Anosmia: 41.0%, ageusia: 38.2%
    - Decreased among older patients
- *"Not yet clear whether COVID-19–related OGDs are transient or permanent"*[1]
  - In one prospective cohort (N = 3191), resolution typical within 3 wks[2]

"Respiratory virus infections are associated with neurological and psychiatric sequelae, including Parkinsonism, dementia, depression, posttraumatic stress disorder, and anxiety . . . Significant long-term neurological and psychiatric sequelae have to be anticipated in COVID-19, especially in survivors of severe disease."[3]

- Cognitive monitoring of recovered patients may be necessary

1 Agyeman. Mayo Clin Proc. 2020;95:1621-2. Lee. J Korean Med Sci. 2020;35:e174. 3. Iadecola. Cell.[2020;[epub]

Slide Credit: clinicaloptions.com

38

Psychological and Personality Issues

- Fear of returning to work or interacting with others
- "Post Traumatic Stress Disorder" issues

39

What is "Post-Acute Sequelae of SARS-CoV-2 Infection" (PASC), a/k/a "Long COVID"?

- No universal definition
- Often presents as reported **persistent severe fatigue, headaches, and brain fog (mild subjective cognitive impairment) >4 weeks** after acute illness and may be **independent of acute illness severity.**
- Myalgic encephalomyelitis-like, e.g. "chronic fatigue syndrome"
- Controversial; Physical? Psychological?

40

Neurological Symptoms-- Brain Fog

- Most common neurological symptom, including for non-hospitalized patients.
- Issues with short-term memory, concentration and word-finding/speech difficulty.
- No clear correlation with severity of COVID infection, age or comorbidities. (unusual)
- Symptoms often fluctuate, "good and bad days"
  - – Fluctuations often correlate with other symptoms like fatigue and dysautonomia.
- Impact on life varies: some able to still work, others on disability.
- Sleep: many patients with poor sleep.
- Mood: many patients experiencing depression, anxiety and/or PTSD.

Navis A. Post-COVID Neurological Symptoms: Experiences from Our Center, Icahn School of Medicine at Mount Sinai

41

Cognitive Impairment Post-COVID

- **Subjective Cognitive Impairment**
  - Concentration and Attention
  - Memory
  - Executive Functioning
  - Slowed thinking / "Brain Fog"
- **Objective Cognitive Impairment**
  - Concentration and Attention
  - Memory
  - Executive Functioning
  - Visual Attention
  - Visuospatial Functioning

Gulick SH, Mandel S, Maitz EA, Brigham CR. Cognitive Screening Tools: Assessing Neurological and Neuropsychological Sequelae. Practical Neurology. In press.

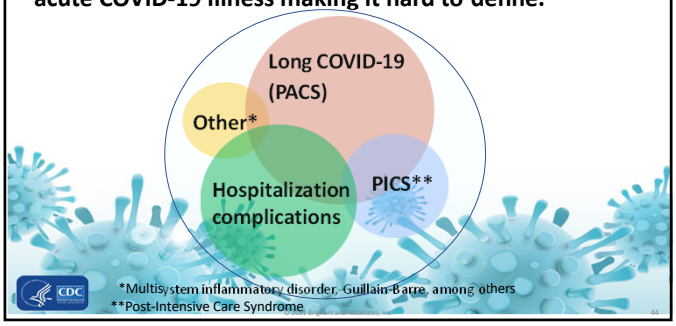
42

What Might Be Occurring?

- Damage to central nervous system?
  - Role of vasculature?
- Peripheral nervous system affected?
  - More vulnerable to systemic insults than central nervous system
  - Presence of small fiber neuropathy leading to dysautonomia?
- Postural orthostatic tachycardia syndrome (POTS)?
  - Hyperadrenergic POTS relating to excessive catecholamines
- Myalgic Encephalomyelitis / Chronic Fatigue Syndrome (ME/CFS)
- Psychological?

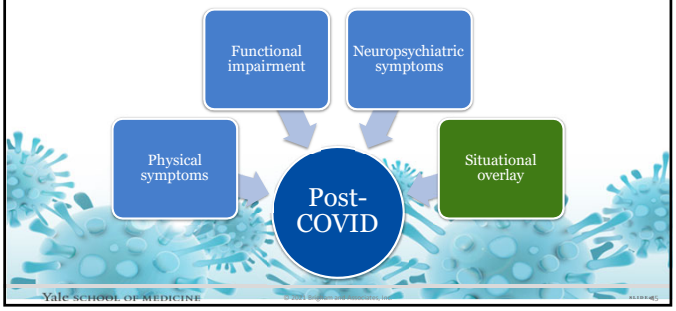
43

Long COVID may overlap with other complications of acute COVID-19 illness making it hard to define.



44

A familiar constellation of challenges in a COVID-19 context:



Yale School of Medicine

45

Post-COVID Evaluation and Management

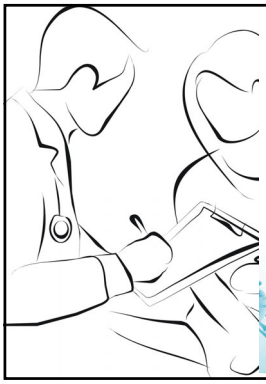
- Need to best practices for efficient and cost-effective management.
- Approaches will evolve with our understanding of this disorder.
- Team approach is required.

46

Post-COVID Medicolegal Evaluation

Issues and Best Practices

47



Clinical Scenarios

1. Asymptomatic with positive PCR test
2. Mild disease with positive test, recovered at home and now asymptomatic
3. Mild disease with positive test, recovered at home and now symptomatic
4. Moderate to severe disease (e.g., hospitalized) and now asymptomatic
5. Moderate to severe disease (e.g., hospitalized) and symptomatic

48

Potential Questions

- Did the person have COVID-19?
- What was the cause of the COVID-19, e.g., occupational or non-occupational?
- Are there other sequelae from the acute infection?
- Has the person received appropriate care and rehabilitation?
- Is the person at maximum medical improvement (MMI) physically and psychologically?
- Is there permanent impairment secondary to COVID-19? Is the impairment apportionable?
- Was is the functional status, i.e., workability?
- What are future medical needs?

 49

49

Clinical Evaluation Essentials

- Comprehensive history is imperative.
- Physical examination must be complete, including screening for POTS and 6-minute exercise test.
- Laboratory testing – basic (common to all)
- Other laboratory testing, studies and imaging dependent on situation.

 50

50

Post-COVID Clinical Evaluation

1. **Record review** (including before the illness)
2. **Inventories**
3. **History**
4. **Studies**
5. **Physical Evaluation**
   - Vital Signs, including pulse oximetry for oxygen saturation percentage, and sitting and standing pulse rate and blood pressure screening for postural orthostatic tachycardia syndrome (POTS).
   - Six-minute walk test.
   - Complete examination (all organ systems)
   - Mental Status Exam
   - Montreal Cognitive Assessment or other cognitive screen

 51

51

Inventories and Assessments (Neuropsychological)

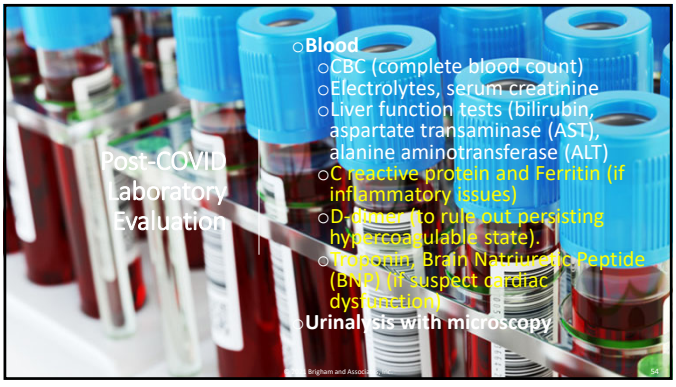
- Fear Avoidance Belief Questionnaire (FABQ)
- Unresolved anger – Injustice Experience Questionnaire
- Somatization – Modified Somatic Perceptions Questionnaire.
- Minnesota Multiphasic Personality Inventory – II or III
- Depression – Beck Depression
- Anxiety – GAD-2 or GAD-7
- And others . . .

 52

52

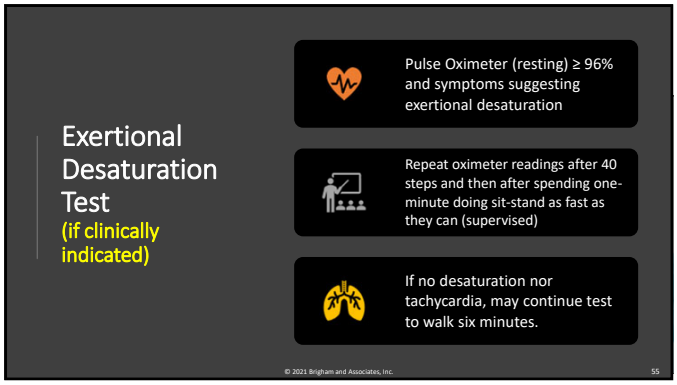
 53

53

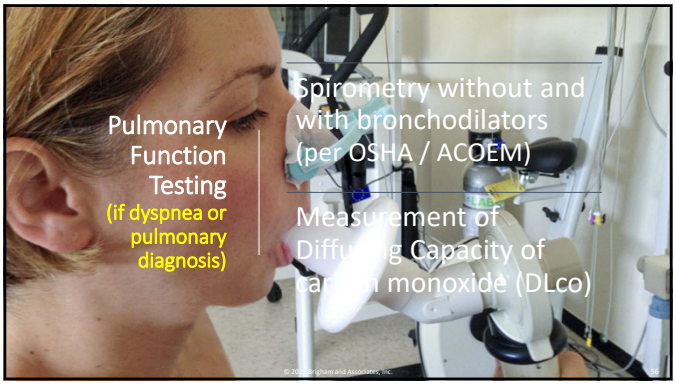


 54

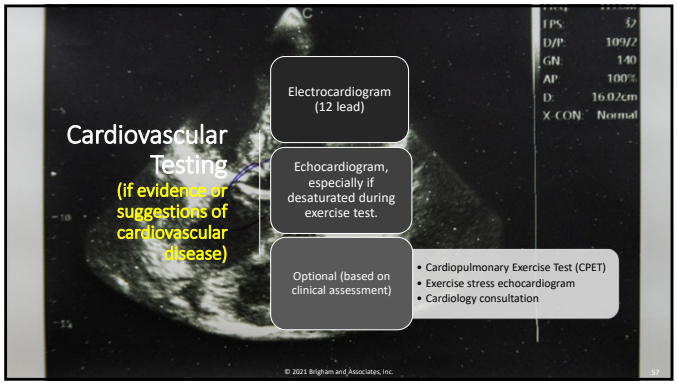
54



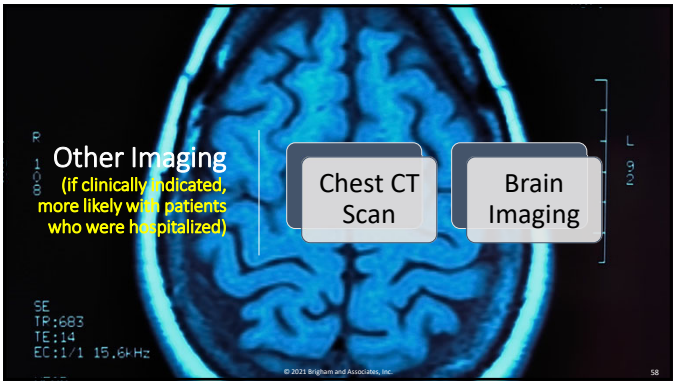
55



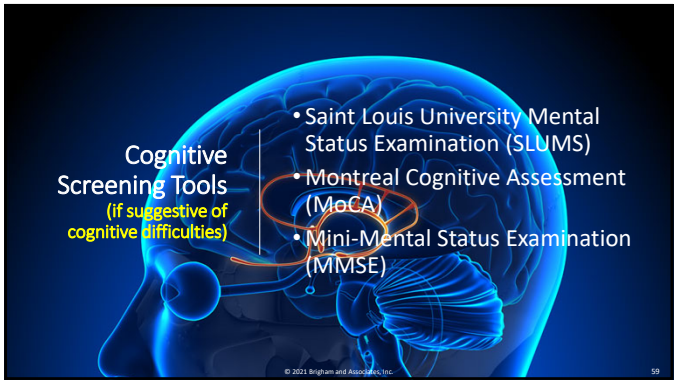
56



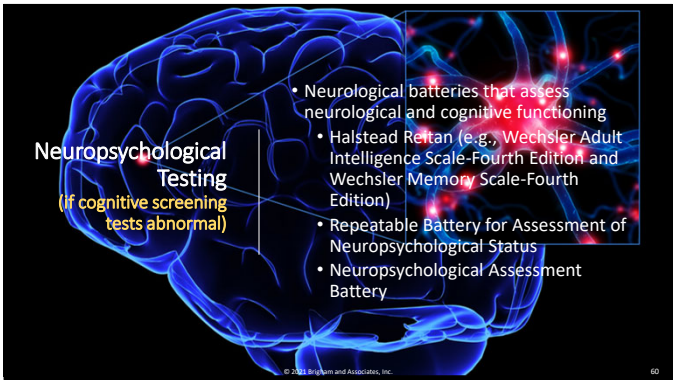
57



58



59



60

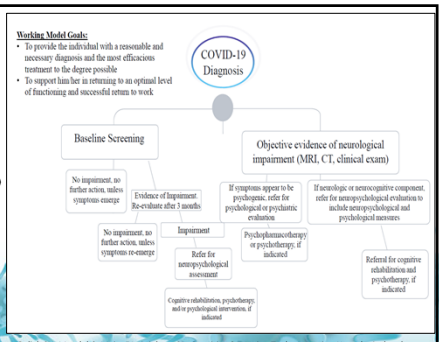
Neuropsychological Testing: Symptom Validity (if cognitive screening tests abnormal)

- Measures of Psychological Malingering
  - Minnesota Multiphasic Personality Inventory –2 Revised Format (MMPI-2-RF)
  - Personality Assessment Inventory (PAI)
  - Structured Inventory of Malingered Symptomatology (SIMS)
  - Structured Interview of Reported Symptoms (SIRS)
- Measures of Cognitive Malingering
  - Green's Medical Symptom Validity Test (MSVT)
  - Test of Memory and Malingering (TOMM)

 61

61

Cognitive Screening Decision Tree



Gulick SH, Mandel S, Maitz EA, Brigham CR. Cognitive Screening Tools: Assessing Neurological and Neuropsychological Sequelae. Practical Neurology. In press.

 62

62

Clinical Analysis

Evaluation Issues

 63

63

Examinee COVID-19 Questions (Provide support documentation)

Detailed history mandatory.

- Positive test for COVID-19? What type of test? When?
- Specific exposure incident at work where you were within 6 feet for 10 minutes or longer of a co-worker who tested positive for COVID-19?
- Has a person you live with tested positive for COVID-19?
- Has the Department of Health told you that you must quarantine at home due to your positive test for COVID-19?
- Has a doctor told you to "self-isolate" at home due to a confirmed specific exposure to a person with a positive test for COVID-19?
- Have you been directed by your employer to leave work or self-isolate?
- Were you hospitalized for symptoms related to COVID-19?
- Have you had an antibody test?

Credit: Synder RB, Talmage JB. Medical Aspects of Causation for COVID-19. Guides Newsletter. 2020;25(4):8-11

 64

64

Documentation

- A copy of COVID-19 viral RNA PCR (RT-PCR) test results (positive or negative), with a legible date and result.
- Employer-supplied job description and work attendance record.
- Employee statement of details on potential workplace exposure to SARS CoV-2 virus and/or COVID-19 patients.
- Results of any other test results given to persons the employee lives with or is consistently exposed to (positive or negative).
- Any written communication from the Department of Health or a physician that directed or suggested home isolation.
- Any direction from your employer to leave work or self-isolate because of COVID-19 exposure(s) or symptoms.
- If hospitalized, a copy of the medical records.
- A copy of any antibody test results.
- Other documents that support or refute a potential claim.

Credit: Synder RB, Talmage JB. Medical Aspects of Causation for COVID-19. Guides Newsletter. 2020;25(4):8-11

 65

65

Testing

Issues	Antigen Tests	Nuclei Acid Amplification Testing (NAAT)	Antibody Testing
• Timeframe • Sensitivity, Specificity • False Positives, False Negatives	• Not as sensitive	• Detect viral RNA via Polymerase Chain Reaction (PCR) • Sensitive and Specific	• Determines is someone previously had infection • Tests immune response • Serums IgG Testing

 66

66

Causation and Apportionment Analysis

Evaluation Issues

67

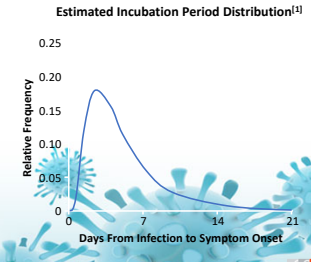
Medicolegal Causation Issues

- In order for an employee to establish compensability, **an employee must prove that the risk of contracting the disease by virtue of employment is materially greater than that of the general public,** e.g., health care workers, first responders, police officers, and fire fighters.
- **Presumption** – varies by jurisdiction, "disputable"
- **Preponderance of the evidence** – AOE/COE - more convincing force and greater probability of the truth.

68

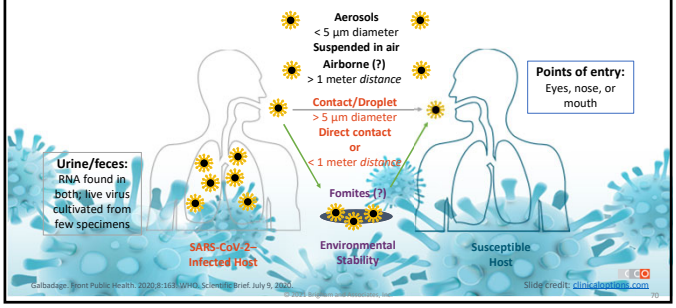
COVID-19 Incubation: Infection to Illness Onset Contact Tracing is Essential

- Among 10 confirmed NCIP cases in Wuhan, Hubei province, China[1]
  - Mean incubation: 5.2 days (95% CI: 4.1-7.0)
- Among 181 confirmed SARS-CoV-2 infections occurring outside of Hubei province[2]
  - **Median incubation: 5.1 days** (95% CI: 4.5-5.8)
  - Symptom onset by Day 11.5 of infection in 97.5% of persons



69

Proposed Routes of SARS-CoV-2 Transmission



70

Causation Considerations

- Timeframe. When was the probable exposure?
- Assess work issues, e.g., other ill co-workers, ventilation, proximity, use of masks, hygiene, compliance with local, state and federal requirements.
- Assess non-work issues, e.g., other ill family members, family and other gatherings, use of masks, hygiene, compliance.

71

Bradford Hill Criteria

- Strength
- Consistency
- Specificity
- Temporality
- Biological gradient
- Plausibility
- Coherence
- Experiment
- Analogy

72

Impairment Assessment

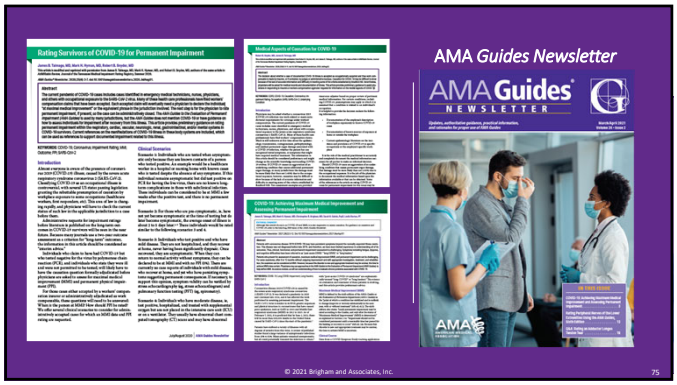
Evaluation Issues

73

Impairment Assessment

- May involve multiple systems.
- Must be based on accurate data and appropriate use of AMA *Guides.*
- Science and concepts evolving.

74



75

Conditions and Rating References: Cardiopulmonary

Condition/Test	Guides 6th Edition	Guides, 5th Edition
Post Pneumonia or Post Pulmonary Embolism Dyspnea Spirometry, measured FEV_1, FVC, DL_{CO} six minute walk to check for desaturation and, possibly, Exercise stress test VO_2 Max	Table 5-4, p 88	Table 5-12, p 107
Myocardial Infarction Coronary angiogram, exercise stress test (METs achieved or VO_2 max) or stress ECHO or Myocardial nuclear perfusion scan	Table 4-6, p 55	Table 3-6a, p 36
Myocarditis or post-viral cardiomyopathy Systolic Dysfunction Ejection Fraction by ECHO or cardiac catheterization, blood BNP test, exercise stress test measured METs achieved, or VO_2 max	Table 4-7, p 59	Table 3-9, p 47 Note: does NOT consider many test results – uses dietary restrictions, medications, and congestive heart failure signs instead

76

Conditions and Rating References: Cardiopulmonary

Condition/Test	Guides 6th Edition	Guides, 5th Edition
Myocarditis or post-viral cardiomyopathy Diastolic Dysfunction-includes above plus "E" and "A" or "E/A ratio" by ECHO	Table 4-7, p 59	Tests Not specifically mentioned, use Table 3-9, p 47
Pulmonary Hypertension ECHO estimate or right heart catheterization measurement of pulmonary artery systolic pressure BNP blood test, VO_2 Max or METs achieved on exercise stress test	Table 4-14, p 72 [Note definition of "mild" has changed since 6th Ed was written]	Table 4-6, p 79 [Note definition of "mild" has changed since 5th Ed was written]

77

Conditions and Rating References: Cardiopulmonary

Condition/Test	Guides 6th Edition	Guides, 5th Edition
Cardiovascular System	Chapter 4	Chapter 3
Myocardial Infarction	Table 4-6, p 55	Table 3-6a, p 36
Myocarditis or post-viral cardiomyopathy	Table 4-7, p 59	Table 3-9, p 47
Myocarditis or post-viral cardiomyopathy	Table 4-7, p 59	Table 3-9, p 47
Pulmonary Hypertension / Emboli	Table 4-14, p 72	Table 4-6, p 79
Arrhythmia	Table 4-6, p. 55	Table 2-11, p. 56
Deep vein thrombosis	Table 4-12, p. 69	Table 4-5, p. 76

78

Conditions and Rating References: Pulmonary, Digestive, Urinary, Skin

Condition/Test	Guides 6th Edition	Guides, 5th Edition
Pulmonary System	Chapter 5	Chapter 5
Chronic pulmonary disease	Table 5-4, p 88	Table 5-12, p 107
Digestive System	Chapter 6	Chapter 6
Liver dysfunction	Table 6-8, p 119	Table 6-7, p 133
Urinary and Reproductive Systems	Chapter 7	Chapter 7
Chronic renal disease	Table 7-2, p 134	Table 7-1, p 146
Skin	Chapter 8	Chapter 8
Rash and Hair Loss	Table 8-2, p 166	Table 8-2, p 174

 79

79

Conditions and Rating References: Hematopoietic, Endocrine, ENT, Visual

Condition/Test	Guides 6th Edition	Guides, 5th Edition
Hematopoietic System	Chapter 9	Chapter 9
Thrombotic Disorders	Table 9-12, p 208	Section 9.6, p 206
Endocrine	Chapter 10	Chapter 10
Diabetes (aggravation)	Table 10-10, p 234	Table 10-8, p 231
Ear, Nose, Throat, and Related Structures	Chapter 11	Chapter 11
Loss of sense of smell or taste	Section 11.4c, p.270	Section 11.4c, p 262
Visual System	Chapter 12	Chapter 12
Vision loss secondary to hypercoagulable state or cerebrovascular accident	Per applicable vision tables	Per applicable vision tables

 80

80

Conditions and Rating References: Neurologic

Condition/Test	Guides 6th Edition	Guides, 5th Edition
Central and Peripheral Nervous System	Chapter 13	Chapter 13
Loss of sense of taste		Table 13-12, 332
Cerebrovascular (vascular, encephalopathy)	Tables 13-4, p 327; 13-5, p 328; 13-6, p 329; 13-8, p 331; 13-9, p 332; 13-10, p 334	Table 13-2, p 309; 13-3, p 312; 12-4, p 317; 13-5, p 320; 13-6, p 320; 13-7, p 323; 13-8, p 325
Insomnia	Table 13-6, p 329	13-4, p 317
Upper Extremity CNS Dysfunction (myopathy)	Table 13-11, p 334	13-16, p 338, 13-17, p 340
Station and Gait Disorders (myopathy)	Table 13-12, p 336	13-15, p 336
Headache	Table 13-18, p 342 or Chapter 3	Chapter 18

 81

81

Conditions and Rating References: Mental and Behavioral

Condition/Test	Guides 6th Edition	Guides, 5th Edition
Mental and Behavioral Disorder	Chapter 14	Chapter 14
e.g. Post-Traumatic Stress Disorder, Anxiety, Depression	Table 14-9, p 357; 14-10, p 358; 14-17, p 360	Table 14-1, p 363

 82

82

Subjective complaints without objective findings not ratable

"Subjective concerns, including fatigue, difficulty in concentrating, and pain, when not accompanied by demonstrable clinical signs or other independent, measurable abnormalities, are generally not given separate impairment ratings." (5th ed, 10)

Subjective complaints (eg, fatigue, difficulty in concentrating, sleep difficulties, and weakness), when not accompanied by demonstrable clinical signs or other independent, measurable abnormalities, are generally not given separate impairment ratings. (6th ed, 24)

 83

83

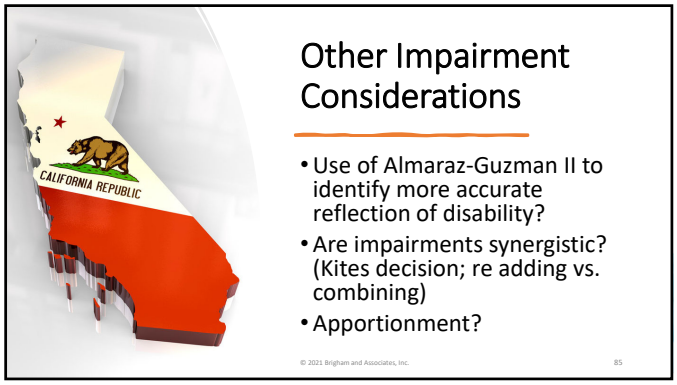
Unknowns

Future medical problems not yet recognized

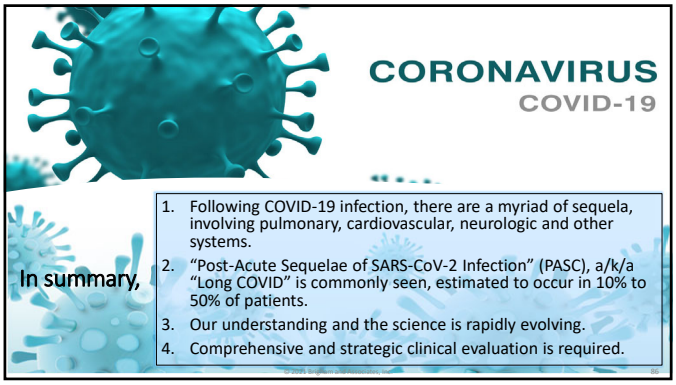
Examples:

- Post-polio syndrome (PPS)
- Asbestosis
- Hepatitis C and cancer

84

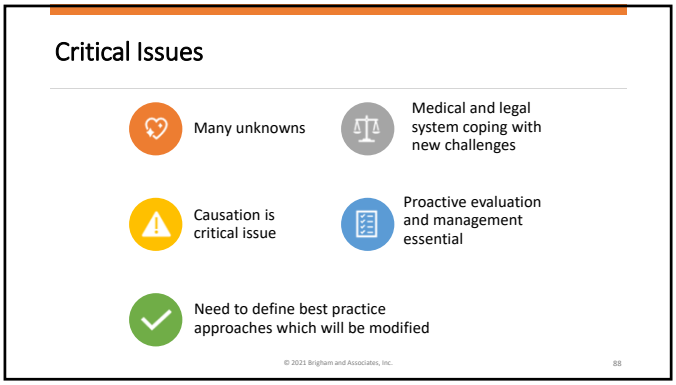


85



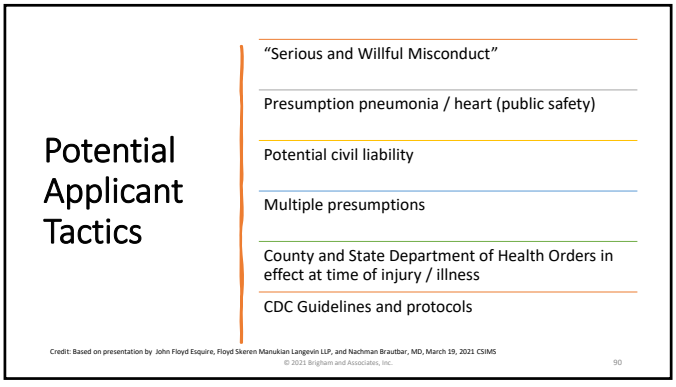
86

87



88

89



90

Potential Defense Strategies

- Accept presumption cases – forgo investigation?
- Accept all outbreak cases?
- Determine likely cost of each and decide if it's cost effective to deny?
- Settle all cases with Compromise and Release, even if employee is still work. (Future is unknown.)
- Admit COVID, deny body parts (difficult).
- Consider impact of other stakeholders and relationships, labor-management relationship, press, OSHA, etc.
- Team approach required.

Credit: Based on presentation by John Floyd Esquire, Floyd Skeren Manukian Langevin LLP, and Nachman Brautbar, MD, March 19, 2021 CSIMS

91

Severity Classification

Credit: Originally based on presentation by John Floyd Esquire, Floyd Skeren Manukian Langevin LLP, and Nachman Brautbar, MD, March 19, 2021 CSIMS

Category	Category 0	Category 1	Category 2	Category 3	Category 4
Classification	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
TTD	None	Minimal	Moderate	Extended	Extended / Death
Hospitalization	No	No	Yes/No	Yes	ICU
Symptoms (Acute)	None	Mild	Mild to Moderate	Moderate to Severe	Moderate to Severe
Symptoms (Post-Acute)	None	Mild	Mild to Moderate	Moderate to Severe	Moderate to Severe
Representation	Not	Possible	Yes	Yes	Yes
Jurisdiction	Conservative	Moderate	Liberal	Liberal	Liberal

92

Post-COVID: A Profound Challenge

- COVID-19 not only has impacted society and our own lives, but it will also profoundly impact the workers' compensation and liability fields.

93

94

95

Contact Information

Christopher R. Brigham, MD
cbrigham@cbrigham.com

www.cbrigham.com
www.impairment.com

96