



A Massage Therapist's Guide to COVID-19

Ruth Werner, BCMTB
www.ruthwerner.com

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What We Will Do Today

Definition

Demographics

A little bit of math and statistics

Pathophysiology

New variants

Signs and symptoms

Complications

Treatment

Prevention

What about massage—

Risks, benefits, accommodations

Screening questions

Resources

Definition

Corona Virus Disease of 2019

Infection with SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2)

Single-strand RNA virus in CV family

Usually enters the body via respiratory tract and lungs

Demographics

(as of 4/24/2021)

Worldwide-

In US:

Per coronavirus.jhu.edu/map.html

Demographics

Who is most at risk for severe illness and death?

Elders, especially in nursing homes

People who live and/or work in high-density settings

People with pre-existing illness are likely to be the most sick

Especially CV disease, diabetes, obesity, COPD

Other factors...

People of color are more likely to be infected and more likely to die compared to white people

Several reasons

Men more likely to die than women

Blood type predisposition?

Other factors related to inflammatory activity...

US Statistics

R0

Reproduction number: transmissibility

Goal is < 1

Positivity rate: what percentage of tests are positive?

Speaks to activity of virus *in a geographic location*

Case fatality rate (CFR) vs. infection fatality rate (IFR)

Case fatality rate (CFR)

From diagnosed cases

560,000 deaths from 31.1 million diagnoses: 1.8%

(almost 2% of diagnosed cases are fatal)

Infection fatality rate (IFR)

Based on estimates of whole population exposure

CDC estimates 83.1 million infections (reported and not)

<https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/burden.html>

$550k / 83.1m = .07\%$

Questions on reported mortality

“With COVID-19” vs. “FROM COVID-19”

Underlying diseases make death more likely
SARS-CoV-2 is the precipitator

Are mortality rates falling?

In this moment, yes
Treatment is more effective
Hospitals have more capacity in some areas
Vaccine program
(don't get too comfortable...)

US Excess Mortality

Survivors

Mortality is not the only cost
Many survivors deal with long-term consequences
No way to predict their ability to return to normal function
More on that later...

So far we have...

Defined COVID-19 and SARS-CoV-2
Looked at worldwide and US statistics and demographics
Defined...
Case fatality rate
Infection fatality rate
R-number
Positivity
Discussed mortality and other costs

Now we will...

Dive into pathophysiology:
How does this virus cause the disease?

Pathophysiology

Virus enters the body by way of the respiratory tract

Oral-fecal transmission also possible
Tracking via sewage...

Doesn't seem to be easily blood-borne or food-borne
Some cases of maternal-fetus transmission

Airborne respiratory droplets

Talking, singing, coughing, sneezing, laughing, BREATHING

Virus stays airborne for about 3 hours; other surfaces depend on circumstances

(maybe longer)

Droplets can fall on surfaces, be transmitted by hands (probably less often than airborne)

Humidity helps droplets to fall faster

New variants

B.1.1.7 (UK)

More transmissible

May stay communicable for longer

More deadly

Now dominant in US

Vaccines are effective to prevent severe illness

B.1.351 (South Africa)

Infects people who have recovered

Vaccines are effective to prevent severe illness

P.1 (Brazil)

Similar to B.1.351

May be able to reinfect patients

Vaccines are effective to prevent severe illness

“Homegrown” variants

B.1.427, B.1.429

May spread more easily

<https://www.cdc.gov/coronavirus/2019-ncov/transmission/variant.html>

More will develop unless we get ahead of them

Masks

Why we wear masks

Now we should wear double-masks or upgraded masks, especially indoors with others (especially in anyone is unvaccinated)

Pathophysiology

Virus enters air passageways

Mouth, nose, maybe eyes

Travels to lungs

Fever, dry cough, chest pressure are the most typical early symptoms

Lots of other symptoms as well, high variability

More on symptoms later...

Gateway: ACE-2 receptors on cell membranes

Alveoli

Heart

Liver

Kidneys

GI tract

CNS

ENDOTHELIUM

Cellular damage from...

Direct viral attack

Normal immune system response

Outsized inflammatory response (cytokine storm, Bradykinin storm)

Alveoli collapse; limited gas exchange; scarring (“ground glass”)

Loss of lung function + endothelial damage + exaggerated inflammatory response →

Hypoxia

Microvascular thrombosis

Emboli (macrovascular thrombosis)

Poor tissue perfusion

Inflammation, edema

Different consequences in different tissues

Most people recover (but maybe not fully)

“Long-haulers” are a whole new population

More on that in *complications*

Testing challenges

Nasopharyngeal swabs

Most accurate 1-2 days before and after symptoms begin

False negatives

Accessibility, delays in results

Fast self-testing on the horizon?

Now we need genomic sequencing

Antibody tests

2 types of antibodies, very time-dependent

Antibody degradation

Prospects for immunity...

T-cell immunity vs. B-cell immunity

Antibodies produced by B-cells may be short-lived

T-cell memory may be more durable

COVID vaccine sea shanty!

<https://twitter.com/i/status/1352520281693310977>

Signs and Symptoms

Usually 2-12 days after exposure

Can be as long as 3 weeks

PROFILE VARIES!

Most typical--

Dry cough, chest pressure, shortness of breath, fever and chills

But also...

Muscle & joint pain; severe fatigue; headache; loss of smell and taste; congestion and runny nose; sore throat; nausea, vomiting, diarrhea, and more

Each of these indicates viral activity in different areas

Communicability

Most communicable...

48-72 hours before symptoms to ...

Hard to know for asymptomatic people

CDC says isolate until 2 weeks after *onset* of symptoms

Complications

(the short list)

(Most relevant for MTs)

Combination of cell damage, immune response, **exaggerated inflammation...**

Coagulopathy

Skin signs

Heart damage

Kidney damage

Lung damage

CFS/ME

Muscle and joint pain

Nervous system damage

Mental and mood issues

Others

Coagulopathy

Endothelial damage leads to

Loss of O₂-CO₂ exchange in lungs, everywhere else

Microvascular damage in skin (petechiae, COVID-toe, other signs) and internal organs

Microvascular thrombosis in organs

Macrovascular clotting (stroke, heart attack, PE, other infarctions)

Skin Signs

Heart damage

People with pre-existing CVD at highest risk

Some patients develop new heart problems

Viral attack on myocardium

Plus immune response and inflammation

Hypoxia and thick blood

Extra load on heart function

Stress cardiomyopathy, arrhythmia, heart failure

Damage may persist, unclear how long

Kidney damage

Viral attack on nephrons, beta cells, inflammation

Can also damage the pancreas: sudden onset diabetes

Tiny infarctions, damage to glomeruli

Low tissue perfusion, hypoxia

Can require temporary dialysis

May cause long-term damage

Lung damage

- Scarring may be permanent
- Persistent breathing problems
- Pulmonary fibrosis

CFS/ME

- Chronic fatigue syndrome/ myalgic encephalomyelitis
- Debilitating fatigue
- Post exertional malaise
- Brain fog
- Persistence

Muscle and Joint Pain

- Severe, deep, unrelated to physical activity
- Several possible factors
 - Relapse with inflammation
 - Chronic fatigue/fibromyalgia-like symptoms
 - Hypoxia, poor perfusion of muscles and joints
 - Microvascular thrombosis
 - Rhabdomyolysis (especially with focal pain)
 - Can lead to kidney damage

Nervous System Damage

- Virus may access the CNS via the olfactory nerve, axonal transport
- Viral particles have been found in CSF
- Cerebral hypertension, encephalitis
 - Depresses respiratory drive, vicious circle
 - Dizziness, nausea, vomiting, diarrhea, headaches, seizures
 - Agitation, memory loss, poor concentration

Sensory function changes

- Loss of taste, smell
- Numbness, paresthesia in extremities

Risk of stroke from coagulopathy

Mental and Mood Disorders

- Anxiety, depression
- Isolation, touch deprivation, fear of making others sick, **trouble breathing**

Post intensive care syndrome (PICS)

- Unfamiliar surroundings, heavy sedation, nightmares, paranoia
- Symptoms may persist for weeks or months
- A form of PTSD

Other Complications

- Episodic resurgence of symptoms
- Shingles
- Autoimmune flares, including vasculitis
- Blood glucose control, new onset diabetes
- Guillain-Barre syndrome
- Hair loss
- Palpitations
- Positional orthostatic tachycardia syndrome (POTS)
- Etc., etc., etc.

<https://www.facebook.com/groups/COVID19survivorcorps>

Long-haulers

- Unclear what percentage of patients have long-term symptoms
 - WebMD says about 10% of diagnosed cases
 - 75% of those hospitalized
- Often occurs in people who were not hospitalized
- Dominant symptoms may shift over time
- New, unexplored medical territory, now getting some attention

Respiratory problems can include...

- Persistent shortness of breath, pulmonary fibrosis (#1 reason for lung transplants now)

Neurological symptoms can include...

- Cognitive problems, balance problems (BPPV), paresthesia, problems with swallowing and speech, anosmia
- Anxiety, depression, PTSD (PICS), sleep problems

Catching up...

- We have talked about
 - Definition
 - Demographics and statistics
 - Pathophysiology
 - Signs and symptoms
 - Complications and long-haulers...

That's a lot!

- We're coming down the home stretch

Treatment

For hospitalized patients...

- Variety of supportive drug therapies

 - Timing matters

 - Antivirals, anti-inflammatories, anticoagulants

 - Convalescent antibodies, monoclonal antibodies (early)

 - Prone patients seem to help

- Ventilation if absolutely necessary

 - Poor survival rate

For patients who were not hospitalized as well as those who were...

- Infection can still be severe

- Repercussions are extensive

- It can be hard to get appropriate care

- Altruistic acts*

Prevention

Standard:

- Physical distance (6 ft. may not be enough)

- Masks (high-grade or double)

- Frequent handwashing

Vaccines

- Pfizer and Moderna

 - Use mRNA to introduce viral spike, induce immune system reaction

 - Need refrigeration/super-freezers

 - 2 doses

 - Reaction risks

 - Anaphylaxis

 - Immune system reaction

- Johnson & Johnson

 - Viral vector

 - 1 dose

 - (why the pause?)

Vaccines and Communicability

It is NOT possible for a person to catch or spread the virus by receiving the vaccine

It is possible (but unlikely) that a vaccinated person can still transmit virus

Vaccinated people need to continue to use masks

- Yes, even in a massage room with 2 vaccinated people

“Breakthrough” infections in vaccinated people
Vaccines and New Variants
Moderna, Pfizer, J&J are efficacious
The mRNA and viral vector platforms allow for future fast development

All reduce the risk of severe infections and death

More variants are emerging all the time– *it’s a race!*

Vaccines and Massage Therapy
Best to wait at least 48 hours
Or as long as it takes for reactions to clear up

Apply What You Know

Risks

Poor ventilation and air quality
Hygienic precautions for prevention
No face massage for a while
Blood clotting and risk of embolism
Anticoagulants or other drugs
Activities of daily living
Petechiae and risk of bruising

Other complications

Benefits (for those in recovery)
Support during a challenging time

Movement is better than no movement

Can help with breathing, anxiety, depression, muscle pain, fatigue, isolation, etc.

Accommodations

Hygienic precautions

Attention to ventilation, air quality, and humidity
The longer the time in an unventilated space, the higher the concentration of aerosols

Ask about signs of cardiopulmonary distress
Chest pain, shortness of breath, edema, cramping...

Check for skin signs: COVID-toe, petechiae, rashes

Work conservatively

Incremental increases in intensity

Focus on ease of breathing, conveying a sense of being able to cope

Consistent follow-up to ask about unexpected responses or reactions

Document everything!

ON TOP OF REGULAR SCREENING

Cleared for communicability?

Signs of DVT?

New pain with exertion?

Skin lesions?

Anticoagulants or other meds?

Activities of daily living?

Get details!

In general:

Work conservatively

Check in the next day

Gradually increase intensity of bodywork

Document everything!

Resources

<http://ruthwerner.com/massage-therapy-and-covid-19/>

Podcast: In the Bubble

<https://www.lemonadamedia.com/show/in-the-bubble/>

Eric Feigl-Ding (@DrEricDing)

Epidemiologist, Health Economist, amazing COVID-19 updates

Massage, Health Practitioners and COVID-19 (FB group)

Thank you!