**Webinar Talk:** Coronavirus and the Dental Professional

**Speaker:** Dr. Leslie Fang. Nephrologist and Internal Medicine specialist from Mass General Hospital in Boston

 The webinar, hosted by the Seattle Study Club gave the historical background of how the Coronavirus was discovered, the way it acts, and the ways to keep us safe. It was a fascinating 90 minutes that described all of the research that has been taking place in the just the past 4 months.

Dr. Fang started off with the most recent statistics of the morbidity and mortality of the virus since 3/23.

**Worldwide:** Cases 37,646 Deaths 16,319 Recovered 101,399

The very first case was linked to an individual who visited the Huanan Market in Wuhan, China.

Dr. Fang is concerned that Coronavirus has similarities to the SARS (Severe Acute Respiratory Syndrome) which first became known in China in the early 2000s.

Both of these diseases started in bats, whose response is extremely tolerant to the virus. The virus sheds in the bat’s feces (guano), or then spreads the virus to other animals such as a cat, which then spreads the disease to humans.

A similar virus, MERS (Middle East Respiratory Syndrome) was also known as camel flu which was first identified in Saudi Arabia 2012.

**The Beginning**

The first recorded case of Coronavirus began with a man diagnosed with pneumonia on November 6, 2019 after visiting the Huanan Market.

Incubation of the disease can last from 2-14 days . Dr. Fang says that if you have a known exposure and can last two weeks without developing symptoms and testing positive, then you are free and clear.

The first U.S. patient was a 35 year old male who was visiting family in China and then came back how to Washington State having symptoms of a 4 day cough, low grade fever, and fatigue for a few days. It looked like a common cold until he became short of breath on day 6.

**Where do symptoms start?**

Most symptoms start in the back of the throat resulting in a dry cough. 81% of infected individuals had a mild disease for the first 6 days. On day 7 they were in the hospital. They rapidly developed an interstitial Fibrosis day 9 and developed all individuals needed to be placed on a respirator by day 10. On average, hospital stays would last 2 months before discharge if they developed Acute Respiratory Distress Syndrome (ARDS).

**How is it diagnosed?**

The diagnosis is made by serological and genetic markers. The clear cut diagnosis of the infection is by using an oral and nasal swab. The testing used to be done just by the CDC, but due to the overwhelming number of tests being taken, they can now be sent to a number of labs in this country. The process decides if there is a unique sequence in this particular virus. The lab does real time Reverse Transcryptase Polymerase Chain Reaction (PCR) is the process used to detect the virus by testing the genetic material. It is possible to get a false negative if the swab was not done correctly, or if the viral load is infinitesimally small you could get a negative test that could turn positive the next day when you swab the patient. It would be virtually impossible to get a false positive unless the collected material was mixed up with another individual. There is also a blood test available, but because if you can detect the virus in the blood, you are talking about an overwhelming sepsis. The purpose of the blood test would be to see if once you have been exposed, have you developed the immunoglobulin IgG or IgM antibodies. Dr. Fang’s patients who had these antibodies were not tested because their management was successful before there were enough tests to go around, told him that this was the worst flu they have ever experienced. The good news is that if you do develop these antibodies, you will be immune……if you survive.

The Coronavirus, also known as COVID-19, has been isolated in the throat and the nasal cavity by a nasal swab. It has also been found in saliva (PCR), feces (PCR), and aerosolized droplets (PCR).

**What about the droplets?**

Can the virus float in air and travel in air and go into the venting system and wind up being transmitted through long distances through aerosolization. Dr. Fang says normally not, but unfortunately the dental professional will be exposed to all of these processes (hopefully not feces). The only way to protect oneself from getting infected by these droplets is with an N95 mask. Transmission is very rapid and comes mainly from asymptomatic patients. Transmission of disease can happen very rapidly and there is no question whatsoever that we wind up with the first cluster of people being shut down from the Chinese market place, yet there continues to be a lot of transmission where it is now clear that there was somebody exposed to someone who was coughing or sneezing. We are beginning to find out that the aerosolization is just mode of transfer, and that the virus can be transmitted from contaminated surfaces or the fecal-oral route. As of two weeks ago infected people were sent into a negative pressure room and in addition to taking care of the COVID-19 positive patients, they began to swab everything in the room-the bed, the chair, the toilet, the toilet seat, the door knob and also the workers swabbed themselves as they left the room. They found unfortunately a significant amount of contamination on all of these surfaces. It is very important to decontaminate the entire dental operatory after use.

**Why six feet distance?**

An experiment was done in China where a symptomatic person was placed in a closed room had to sit in a chair in the middle of the room for 2 hours. Afterwards they would be escorted out, and scientists in hazmat suits would swab all of the areas surrounding the chair. They found the presence of the virus on the door handle, and within a six foot circumference of the chair.

**Can asymptomatic people shed the virus?**

There were 97 people in China who were being repatriated to Singapore. 3 people were screened out right off the bat because they were already febrile and not allowed to get on the plane. Two of the individuals with fever and transferred to the hospital tested positive. 6 people of the remaining 94 were symptomatic, but tested negative positive for the virus. There was one asymptomatic patient who tested positive and another asymptomatic patient that tested weakly positive. Both went to the hospital, and they never came down with the disease, but it was very clear that they were shedding virus. All of the remaining people that had a negative culture immediately and were quarantined for 14 days before leaving for Singapore. There were symptomatic people who tested positive. There were symptomatic people who tested negative, and asymptomatic who tested positive. The good news is that there was only one person out of 97 that was symptomatic but tested negative.

In Germany, there were 126 passengers. Ten were immediately transferred to the hospital due to symptoms. Two had known contact with people who were infected and tested negative. Six were symptomatic and tested negative, and two had been accompanying people thought to be infected and tested negative. One patient was symptomatic upon going to the medical assessment center and the rest of the 112 tested negative but two completely asymptomatic individuals tested positive.

The first report came out on February 15th looking at the first 44,626 cases in all of China. The Chinese CDC found that 81% of confirmed COVID-19 cases were described as mild, and 1.2% were asymptomatic.

On the Diamond Princess cruise ship there were 6500 passengers. Everyone was tested and there were 634 people who tested positive, and 328 of those showed no flu-like symptoms. We cannot tell who is positive just by looking at them.

**Can an asymptomatic person pass the virus?**

A 33 year old German man had attended meetings at his Munich Company on January 20 and 21 with a woman from Shanghai. She had no signs or symptoms while in Germany but became ill on her flight back home where she tested positive for COVID-19 on January 26th  . The man was notified and went to the Infectious Disease Hospital in Munich where he presented as afebrile and asymptomatic. A nasal swab tested positive for COVID-19. On January 28, three additional German employees tested positive, one of which only had contact with the woman, and the other two only had contact with the man. If this woman had not called back to the German company, the outcome could have become much worse.

Dr. Fang said that months later the woman realized that she was having some minor muscle aches during the meeting, but just took acetaminophen for it.

**How contagious is the COVID-19 virus?**

Dr Fang discussed the differences between the contagiousness of the three respiratory viruses.

How long does it take for 1000 people to become affected by the virus?

MERS it took 903 days (2.5 years) for 1000 people to become infectious, but it was very deadly but not particularly contagious.

SARS it took 130 days so it could become quite devastating within a short period of time.

COVID-19 only took 48 days therefore, this is the most contagious virus of the three.

**How deadly is the COVID-19 virus?**

MERS affected only 2400 people and killed 800 of them. In essence out of 50 people infected, 17 people will die.

SARS will kill 5 people out of 50

COVID-19 will kill only 1, therefore it is the least deadly of the three viruses.

**What were the current # of cases?**

COVID-19 373,646 SARS 8096 MERS 2494

**What were the current # of deaths?**

COVID-19 16,319 (4.3%) SARS 774 (9.5%) MERS 858 (34%)

**Morbidity and Mortality**

As of February 11, 2020, there were 44,672 cases across China. The virus spread to all provinces in the country within 30 days despite a lockdown of 60 million people, the isolation of all suspected patients, quarantine of entire cities, limitations of travel, and the cancellation of all festivities and gatherings including the Chinese New Year.

Of individuals who tested positive, 80.9% classified their symptoms as mild

 13.8% classified their symptoms as severe, the worse case of flu they ever had

 4.7% were classified as critical requiring ICU care and

 2.3% died.

The highest mortality rate was in individuals 80+ years. All had pre-existing conditions:

10.5% had heart disease 7.3% had diabetes 6.3% had chronic respiratory disease 6% had high blood pressure

5.6% had cancer, and .9% had none.

The majority of cases are found in individuals between the ages 20-69, and although most individuals in this cohort were classified as having the mild form of the disease, there has been mortality between 0.07-1.0 %. These young and healthy individuals may have no known preexisting conditions, and may have a low risk of dying, but they will bring the virus home to their families and some of them may become patients that don’t do well with the disease, and the young people will also promote the spread of the disease which is the exact opposite of what China is attempting to do.

Currently,. the Chinese CDC listed a mortality rate of 2.3% vs the Flu which is listed as 0.1%.

**Why is COVID-19 so deadly?**

The sharp red pointy things (my words, not Dr. Fang’s) on the virus will attach to the bronchioles and kill the cilia cells, resulting in the lungs filling with fluid. The body’s immune system becomes alerted, resulting in a cytokine response which sends immune cells to fight the infection. Sometimes these immune cells kill everything, including healthy tissue, resulting in the need to be put on oxygen or a ventilator. The damaged lungs have a harder time getting oxygen to the bloodstream and consequently the organs begin to die due to the lack of adequate oxygenation, thus ending in multiple organ failures.

**Where can I find Dental Professional Recommendations?**

Recommendations have become modified as time goes on and we learn more about the virus. Dr. Fang then highlighted the things we dentists need to know and do. He warned us to be aware of the potential exposures and how to mitigate them. A good resource is the Ultimate Cheat Sheets guide which can Dr Fang developed and can be found at <http://www.ucsbook.com> and click on the Corona virus button.

**What should we be doing in our offices if we see patients?**

Have hand sanitizer everywhere. Wash hands/Wash hands/ Wash hands

Asymptomatic people aren’t coughing or sneezing, but the surfaces they touch will still be contaminated. Currently in China, paper money is being taken out of circulation and being disinfected or burned.

The virus can remain infectious on plastic for 5 days pen and paper 4-5 days glass 4 days

 wood 4 days aluminum 2-8 hours surgical gloves 8 hours steel 48 hours

All potentially contaminated surfaces need to be disinfected with solutions of .1% Sodium Hypochlorite and .5% Hydrogen Peroxide. The EPA is recommending even stronger concentrations they are using > 3-3.5% Hydrogen Peroxide. Dr. Fang said that almost any product you can find off the shelf would be good enough to get the job done.

**What about Hydrogen Peroxide rinses?**

Studies involved having people testing positive to rinse with a 1% Hydrogen Peroxide solution.

Dr Fang said that an N95 mask is mandatory, and that a facemask over that would be even safer. Goggles are required rather than glasses in order to get the closed shield around the eyes. Be careful not to touch your face when taking the safety equipment off. Sanitize your hands first. Since N95 masks are in short supply, you should only wear them when indicated.

**Why are N95 masks required?**

The COVID-19 virus is .12 microns

A surgical mask can only stop microns larger than 2-10 microns.

A N95 mask can stop viruses larger than .3 microns. The COVID-19 virus is not aerosolized itself, it is on a droplet larger than .3 microns.

Ideally N95 masks should be replaced after each patient, but due to the shortages, they should be replaced when soiled. For this reason you can wear a surgical mask over the N95 mask, but it will get really hot and suffocating after awhile.

**Flattening the Curve**

China has a population of 1.3 billion people. They have experienced 3000 deaths after having a lockdown of 60 million people. There are 60 million people living in France, and 60 million people living in Italy.

As of today, there have been 0 deaths in China, other than from visitors from other countries. Everybody was quarantined for 14 days.

Outside of China there are 373,646 current cases and 13,049 deaths. Dr. Fang warned that if you do nothing, the virus will be allowed to roam free. There would be a tsunami of sick patients which will overwhelm the health care system.

**A retrospective analysis**

In November 1918, there was a worldwide pandemic of Spanish flu ravished the United States. Boston sailors carrying the virus landed in Philadelphia in early September, and parade welcoming these servicemen back from WWI was held in their honor. Two days after the parade, every bed in Philadelphia’s 31 hospitals were filled and over 2600 people succumbed to the flu by October.

At the same time in St. Louis (Yay, St. Louis), the local health commissioner saw what was happening on the east coast and ordered a lockdown of Jefferson Barracks and soldiers first started coming down with flu-like symptoms. In early October, Sunday church services were suspended, movie theaters, saloons and schools were closed, and sporting events were suspended. Although there were protests by business owners, the closures remained. Within 2 days of the quarantine, eight soldiers at Jefferson Barracks were dead, another 8 residents died at St. Louis City Hospital, and the number of area flu cases topped 1150. Stricter quarantines resulted in the closures of all business with the exception of banks, newspapers, and funeral homes. By December 10, the flu peaked in the city with 60 deaths after one day. The quarantine was lifted just after Christmas. Flu and flu-related pneumonia killed almost 3000 St. Louisans in the last three months of the year, but thanks to the quarantine. St. Louis (Yay, St. Louis) had the lowest death rate of the 10 largest US cities. In Philadelphia the death rate was twice as high. At the end of the pandemic, 1/3 of the entire word’s population had been infected, and 50 million killed, including 675,000 Americans. *This information was gathered by several Wikipedia articles.*

**Today’s analysis**

As of March 11, Italy has currently 63,927 cases 6077 deaths 7432 recovered

 China has 0 new cases

 South Korea utilized a tremendous amount of testing and quarantining. They currently have

 8691 cases 111 deaths 3166 recovered

 The South Koreans are being monitored with a Smart Phone App which utilizes the camera to make sure they are staying home. Unfortunately, Dr. Fang says, to accomplish a low amount of deaths one would need to have a high intrusion of civil liberties, something many Americans are unwilling to tolerate.

As of March 11, the US has had 42,032 cases New York has had 20,875 cases and 157 deaths

Dr. Fang is afraid that the US will look more like Italy, and less like South Korea if social distancing is not enforced.

 Remember that deaths will follow the number of cases by at least 30 days, so just because Nebraska does not have a lot of deaths now, you just have to wait until more cases become diagnosed.

**Rules of Thumb**

Stay 6 feet away from everyone.

Don’t touch your face. A person touches their face an average of 29 times an hour.

Everybody must accept their own responsibility or they will be complicit in the infection of others.

 things that must be done to get ahead of the curve: Have effective treatment and develop a vaccine within 30 days because anything after that would be an afterthought given how the cases are rising.

**Treatment**

Remdesivir was been given to the first U.S. patient after the 7th day of symptoms, and the patient got better with the except for a consistent cough. Remdesivir works by decreasing the viral RNA production by confusing it and intrude its ability to create protein. It was originally invented for SARS, but SARS went away and the drug just sat there gathering dust. Then came Ebola, and there was an incredible amount of animal testing that looked favorable so it was used for Ebola virus, but Remdesivr was declared ineffective against it. It is now being used for a third time by using it for COVID-19 since the medication already exists.

Favipiravir is made by Japanese Company Fuji Film. It is a medication similar to Tamiflu which would be taken once a patient becomes symptomatic. There have been encouraging clinical trials with 340 patients in Wuhan, but no one has seen the data. It has just been talked about in press releases. It has a high degree of safety and is effective in treatment. 340 patients that were given the drug turned negative after a median of 4 days after becoming positive, compared to a median of 11 days for those who were not treated with it. X-rays confirmed improvements in lung conditions in about 91% of the patients treated with Favipiravir, compared to 62% of those without the drug. It is not known whether they were randomized studies. All we know is that it has increased the price of Fujifilm stock. (Thanks *The Guardian* article)

Kaletra (Aluvia as seen on TV) is an HIV drug being tested on COVID-19 patients. It is a protease inhibitor that is a combination of 2 antiviral medications-Lopinavir and Ritonavir. Unfortunately, Dr. Fang said that the results were disappointing and not life changing for in individuals infected with COVID-19.

Another drug that has made in the news Chloroquine. Originally it was given in combination with Remdesivir to SARS patients. It is an anti-malarial drug. Chloroquine has most recently made the news because a couple in Nigeria and a couple in Arizona took it after a Presidential news conference touted its effectiveness, and three of the four died.

Hydroxychloroquine (Plaquel) is an anti-rheumatic drug that has also been used for patients with some symptoms of lupus and other autoimmune diseases. It may interfere with the communication of immune system cells. There have been no randomized studies up to date, and Dr. Fang does not like it because the study was not controlled. The study is based on that when Chloroquine or Hydroxychloroquine has been exposed to viruses, hydroxychloroquine is 10x more effective. New York city bought 100,000 doses of Hydroxychlorquine and 50,000 doses of Azithromyocin because there was a French study where individuals who tested positive for COVID-19 were originally taking Azithromycin for unrelated reasons and then given Plaquel to treat the COVID-19. They got better in 5 days rather than 20 days.

**Vaccine**

In order to develop a vaccine, we would need to find the antibodies being developed in affected patients. The problem is that serum developed from one person can only cure 1 person, so this would become extremely expensive.

Within 30 days of the beginning of the pandemic, the Chinese CDC found out it was a coronavirus and then found out what the genome looked like and published the entire gene sequence into the public domain. Scientists at the University of Bern wanted to create the virus in a test tube. They mail ordered the sequence to a company to make a DNA fragment that they put into a yeast cell. The yeast is then being used to incorporate the COVID-19 DNA into its own DNA. There are currently 10 countries committed to this project. The “secret weapon” is Dr. David Ho, a HIV/AIDs researcher employed by Columbia University who first came up with the HIV medical cocktail approach for treatment. He is now leading a team looking for a COVID-19 vaccine.

**What must be done now?**

We can’t sit around waiting for a better drug to be developed. Vaccines will become possible once the gene sequences have been determined, but until then there is no time for prolonged animal studies. Seattle should have a vaccine ready for humans within a month. Israel is developing a vaccine. China is developing a vaccine. The most dramatic is a Chinese epidemiologist who wanted to show her confidence in her vaccine by bypassing all animal, toxicology and pharmacokinetic studies, and injected herself and six of her team members with the untested vaccine on March 4th and they are not dead yet (Who has seen Monty Python and Holy Grail?) It may be ready for use in April. Israel’s coming up with a vaccine.

**Q and A**

Q: If we don’t have N95 masks should we still be seeing dental emergencies in our office?

A: Do you feel lucky? Dr. Fang does not see a way for this to keep the dentist safe. Until N95 masks ramp up their production, Dr. Fang cannot recommend seeing emergency patients without one.

Q: If we can guarantee a patient is not a carrier, then can we do it?

A: The likelihood of an asymptomatic person shedding the virus is 1.2-1.7%. It is still dangerous. When Dr. Fang is treating patients now, he is the only one in the room with the patient.

**A depressing anecdote**

Dr. Fang told the story of a SARS patient who stayed in room 909 of a Chinese hotel for one day before going to the hospital. After his admission, medical staff discovered that 11 rooms on his floor were contaminated with the virus, along with rooms 2 floors above his and one floor below his. The railway of the main lobby floor tested positive as did every single button inside the elevators. Officials knew that the sick individual did not touch all of the buttons, therefore other people’s fingers got contaminated before entering the elevator.

Hand Washing Hand Washing Hand Washing

 Do a total body scrub once you get home from your dental emergency. It may be overkill, but it is recommended in times li like this.

Q: What about pregnant women?

A: A study showed that out of 12 infected women, only 1 baby tested positive for the virus.

Q: Final Words?

A: Practice Social Distancing. It is the only thing we have at this time that has proved effecting in reducing the infection.

 The next Seattle Study Club webinar will be this coming Thursday March 29 at 7:30 pm Central time

 **Title: Withstanding the Financial Implication of COVID-19**

 The speaker will be Dr. Hunter Satterfield a CPA and Partner at Cain Watters & Associates. He will share their Board’s collective thoughts on what’s driving the market volatility, how long it may continue, and the steps business owners need to take to maintain enough cash flow to weather this storm. The live webinar will cover:

* Advisor commentary on the current market volatility
* How to ensure your portfolio is positioned to weather adversity in a “crash like” scenario
* Steps business owners need to take to withstand the financial implications of this pandemic

You can register online at <https://zoom.us/webinar/register/WN_3JbQHeXWScyPyo7bCdGDQQ>

Register quickly because attendance is limited so don’t wait until the day of the event to register.