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# Covid 19 in Orthopedics

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**Q1: Please describe your activity and affiliation.**

A: I am a Orthopaedic surgeon and Spine Surgeon working in a hospital in the Mexican Caribbean region.

**Q2: You have recently published COVID-19 in Orthopedics. What are the main risks for orthopaedic patients, concerning COVID-19 transmission?**

A: Same as for all human beings except for two main distinctions: **the use of orthopaedic walking devices made out of metal and plastic which are COVID-19 reservoirs** and **the virus may have a biofilm producing capability** for staying attached to this devices for long periods of time giving a window of higher transmission risk to the orthopaedic patient and his relatives, caution is recommended for **the right maintenance of this devices**. Second the postop orthopaedic patients carry with in their bodies metal and plastic devices with lots of dead spaces within them that are not in contact with a natural blood flow making this spaces the best survival environment for the virus and may cause relapse of infection in this patients, caution is advised during surgery to the patients and Orthopaedic Physicians.

**Q3: What are the best practices to put in place to reduce the COVID-19 transmission among orthopaedic patients and in orthopaedic wards?**

A: Stay at home, wash their hands constantly, **wash their orthopaedic walking devices and aids** (crutches, Walkers, canes, prosthetic devices, etc.) with soap and water or alcohol, **for non-emergency consultation do Telemedicine** and video-conference from home (most orthopaedic drugs are over the counter medication). **In the hospitalized patients: keep them apart from probable risk sources and COVID patients**, localize them in another wing or region of the hospital, use of breathing N95 masks at all times for protection is needed since if the patient is postop he has a higher risk of being infected and have virus reservoirs in his body and later relapse.

**Q4: How is the COVID-19 able to persist on textiles or on metallic or plastic surfaces? is there a practical way to inactivate it on these surfaces?**

**COVID-19 has a lipid membrane with glycoproteins, this allows the virus to adhere to surfaces like metal and plastic**, the best way to inactivate this on

external surfaces is with saponifiable liquids as it is soap with water, which micelles the surface of the lipid layer destroying the virus.

**Q5: What is the role of viral biofilm? are viral biofilms similar to the bacterial ones?**

A: Lipid membranes are able to adhere to each other forming membranes, this is true for micelles, bacteria and viruses would be no exception, this is the key to my research. All biofilms made by all kind of lipid membrane beings allows them to survive.

**Q6: Is there any serum marker that can be easily made in an orthopaedic ward to raise the suspicion of a COVID-19 infection?**

A: Yes black light with a fluorescent dye may be sprayed over the suspicious surface reflecting a fluorescent reaction.

**Q7: When should we test our patients for COVID-19 and how?**

A: all suspicious candidates that comply with the operative definition. **A rapid IgM test can be performed after a week of infection,** if it is more recent **a PCR from the bronchoalveolar tree is a sensitive test, a pharyngeal swab test can also be performed.**

**Q8: Please add further comments you think may be helpful. Consider that many of our readers live in low- or medium-income Countries.**

A: **Prosthetic devices must be thoroughly washed with soap and water, chloride or ammoniac cleaning substances**. Prosthetic devices like crutches, walkers, canes, legs, arms, bionic external components need to be washed to prevent becoming a viral reservoir.

Orthopaedic patients have a higher rate of COVID complication than non-orthopaedic patients. Treatment for patients with total joint replacement and spinal instrumentation may include device removal, for aseptic arthritis may occur, and a metal reservoir will be present.

**Viral Biofilms will open a new line for research**, it is a concept, that I can only explain hypothetically; for example: when we see micelles, coming together

forming a surface like a tissue, but their electrical lipofobic nature allows them to retain their separate individuality like cells do. As bacteria, membranes simple and double share this natural capability.

For now we have to attend to the fact that they attach to metal, plastic, and many other surfaces with a huge survival rate in external environment and a bigger one in a biological environment as the body is.

**This leads to a big yes, to implant related infections.**

Imagine a surgical patient receives a hip replacement and air particles with COVID attach to it during the surgery. In a second stage while recovering in her or his hospital room the patient catches the COVID infection: is discharged with no symptoms and comes back to the hospital, gets treated with improvement, gets discharge and relapses due to this dead spaces in the implant where there is a viral reservoir.

**There is a lot of work to be done.** We need to study this and all possibilities for us to improve the security of orthopaedic patients. And even more when comorbidities may be present.