

IFMBE CED Board & Collaborators (B&C) Q&A with Adriana Velazquez of WHO on March 25, 2020

See B&C at <https://ced.ifmbe.org/about-us/who-we-are.html>; over 150 of us, with 55 present that day from all 6 WHO Regions

1. Adriana WHO COVID19 presentation

I have a very important message to all of you. I just want to say that the world needs us more than ever before. And we need to be there. We need to be ready. We need to have information available. We need to help everybody. WHO needs your help! We need to organize ourselves to have that information available for everybody that needs it.



- We need everything for **oxygen delivery**. Mostly in the ICU, but we were getting questions recently that they want to deliver oxygen not just in hospitals, but also maybe in health centers, or even at home. So, we need to have everything that's required for oxygen delivery.
 - And here you have an oxygen concentrator where there is no oxygen, pulse oximeter to measure the patient and everything a patient ventilator for critical care and they will have everything down to a flow splitter, flow meter, humidifier, nasal prongs, and catheter. If we don't have this equipment, we cannot deliver the oxygen when we're talking about for ventilators; we will also need the laryngoscopes and tracheal tubes, etc.
 - **ICU:** We need resuscitators (the little AMBU bag). And because patients have a lot of problems there is a huge need for suction devices and all infusion pumps. And of course, for the patients in intensive care need a multi-parameter ICU patient monitor with a respiratory rate, noninvasive blood pressure, surface temperature, and EKG.
- Now we're getting a lot of concerns about the non-availability of **pulse oximeters** in low income settings or in health care centers. There is not even a lab test, but just a thermometer and as you know not reliable info but the only a screening tool. So we're thinking of maybe adding respiratory rate or pulse oximetry that can help a lot to triage.
- **PPE:** We should do everything that there is to protect the patients, but also to protect the healthcare workers. And they need the face shield, the scrubs, the pants, and the gown. The sports industry is willing to start manufacturing PPE's, because as you can all see, there are not enough. And we also want to innovate and bring some other facials that are reusable. So we are in that stage (a meeting tomorrow with WHO's innovation team) to see how can we innovate and how can we reuse & wash and reuse because there's just not enough and we're creating a lot of garbage.
- For **in vitro diagnostics**, we have a lot of problems as you have seen from the Director General, who says we have to test this, but the tests are not available everywhere and we are having problems with the transport medium. Many countries started with a reference lab but right now, there are some tests that are becoming available and just cleared by the FDA and the European Commission. And there are other tests that are being determined by WHO team for pre-qualification (EUL).
 - **About 80 tests** have been received. WHO's team is working very hard to really try to define which of these tests can be used or not. The industry is moving really fast to try to have commercial tests. PCR takes about 2 days to get the result to the patient. By that time, it might be too late or you lose the patient that you put the swab and if you did something wrong, that's why this is a major concern.
- Our main concern is to increase the **availability of all these medical devices according to the needs**. So on one side we need to know **who is the market? Who are the manufacturers, how much they are producing, who is the supplier, can we receive them** (as you have seen there are bands in countries),
 - i.e. Europe just want to maintain everything that they produce in Europe but are willing to export because they really cannot do so).
 - India just made a statement (3 days ago): No PPE, and no medical equipment will be exported from India to the world because they need to take care of their resources first, etc.
 - So, there are many, many constraints and limitations on the production. Therefore, we are working on a solution/tool that will be **sent to all manufacturers** to tell us **Do they have enough production?** And if they have it, **when would it be available?**

Yadin: I realize that WHO may use formal professional terms - like Biomedical Engineer, in the slides, however, if we repost the information, we MUST add **Clinical Engineer** term to the post. We all do the work and support the priorities so let the public know about our contributions. Clinical Engineers should be recognized.

WHO is working with the World Economic Forum, the World Bank, UNICEF in doing something that is called the **pandemic supply chain network (PSCN)**, <https://www.weforum.org/projects/pandemic-supply-chain-network-pscn>. But we need health facility assessments in a country level.

- So that means the countries have to tell us **if they have oxygen** because right now, high income countries have almost everything. But in many others, there is no oxygen, not even enough for intensive care units. And maybe they don't even have enough respiratory therapists or intensive care doctors. And of course, we're trying to support with the available biomedical/clinical engineers (BME/CEs).
- So the second thing that we have to do is to **match the countries with their market**, to identify the needs and then be able to channel exactly those they need. We're having a lot of donations in WHO but sometimes it's not good quality equipment or good quality products. So we need to be verifying the technical specifications or trying to source the manufacturers before we release them.
- An email will be sent by Adriana to all the manufacturers and this will support the PSCN with the World Bank and UNICEF. **In the World Bank, there are no BME/CEs** but only pharmacists and they don't know about the equipment.
 - The **medical device industry** is talking with them about the procurement but now they came back to WHO and asked to lead this.
 - But we have very little people it's basically Ale who is helping on the operations supply and logistics team who she's also a CE and myself, but we really need to work day and night and we don't finish. **Our main concern is when the equipment reaches the country.**
 - So imagine that it reaches some countries in Africa **we need to ensure that there is installation, training, supplies, sterilization process and all the management** of the of the good stuff that will be coming into their settings. **So I have put here all the useful links that we have on the 4 issues:** on the PPE, the number of gowns and gloves (because we've been receiving a lot of questions and saying how many should I buy? Where should I use the mask or should I use a gown or two?) so we need to get the specifications for that.
 - Italy's Paolo Lago has us to **translate relevant materials**, so if any of you can help us translate, as Maurice helped us translate one of them (French) and now, Nicolas (Greek) to Greece, and Stefano is translating to Italian, it will help a lot now to disseminate this information.
- So there are the useful links for the treatment equipment needed. See **WHO COVID19 Intro presentation, below**.

- The equipment number one is diagnostics and we have three areas in **vitro diagnostics**.
 - Then we have the **imaging**, images of the CT scanners, (we thank our CE friends in China deeply because they gave us data from CT scanners and very few countries would do that) and the type of patient examined from the CT scanner because maybe it is already very invasive if you have a patient in intensive care unit, it's then impossible to move him to a CT scanner.
 - Maybe at the very beginning in diagnostics, the **respiratory rate and pulse oximeter** may do also the work and manufacturers can help us because they do have devices that measure both. And we have some innovations who are using algorithms and they're combining their EKG, their respiratory rate and the pulse oximeter to be able to have a first diagnostics.
 - **Then on the therapy**. We have to get the oxygen delivery systems, both for primary care and for hospitals, we need the monitoring, link: (in red, yellow, and green are the things that we need, that means the things that can be done or not be done). And then they're sending to our technical specifications for oxygen delivery systems.
 - **For e-health applications**, I'm receiving everyday things that use artificial intelligence and we have a meeting tomorrow to talk about digital applications that can support COVID19 and I need help in these things.
 - For the field of **oxygen, ventilators, and intensive care unit equipment** Ale and I have been asked to do the technical specifications but we have many doubts, like which ones match the WHO ones and if you're talking about the manufacturing industry, which one matches the WHO specifications?
 - And then for the WHO specifications, we have varieties, and we need to put them together as they could be invasive ventilators or non-invasive ventilator, pediatric ventilators or adult ventilators.
 - Or there are ventilators that can run with oxygen concentrators, others that can run on a pipeline to oxygen or other oxygen sources like a pressurized tank.
 - We also need to have our **training courses in various language and maintenance steps**.
 - What should be removed or what should be washed?
 - Which part should be where should parts be used?
 - What should be the care for the ventilators?
 - Because what we don't want is that people that are already sick, to get sicker because of **inadequate sterilization or not proper washing**, or because the ventilator is misused.
 - We are also looking for **innovative ventilators or monitors** that could be simple to use. And now there was a call from the UK Government, saying that there is a search for innovative ventilators that can be manufactured very quickly and that can be simple to use. Remember that we need pressure ventilators to keep the pressure up, because the COVID19 lungs become like fibrosis lungs and cannot expand. So we need to put oxygen with enough pressure so that the patient can start receiving oxygen and then can recover.
 - For the Imaging tools we really need to **find more evidence on the use of the CT scanner**, some are using AI and we have been receiving algorithms for better use of computerized aided diagnostics that are helping for example TB, but now they want to use for COVID19.
 - So there's a big **discussion about which would you choose?** Should we recommend ultrasound to be sent to the centers because of course ultrasound is mobile and you can place in different settings. My next steps are first to suggest to have an online discussion on what could be used for COVID19.
 - We can post recommendations and then people can comment.
 - And then what I want is to have harmonized information organized so that WHO can place in the website and we can make sure that they are translated.
 - So if we have a table that we add the **five translations we can add nomenclature** to them if there is any.
 - And we did have a contact person from Symmetric (volunteer USA-based database company), and maybe add the UMDNS on it, and also reach ECRI and ISO to release the standards for anything that has to do with ventilation.
 - I want to develop tools in **these different languages**. And then we need have a **pricing and availability of these** of these resources.
 - The big problem is that we're getting now comments that some prices are like very expensive and so it will be good to at least to have like a table/database where these reference prices on how much should we pay for the different equipment.
 - Nowadays many people are donating but others are taking advantage of the situation and these prices are just increasing.
 - **WHO has done the technical specifications** for oxygen therapy devices and then for oxygen concentrators and but still they need to measure blood pressure and other things and I hope this work will be coming out very soon.
 - **On WHO COVID19 website**: There are so many things coming up that we don't have even time to organize them in boxes. This is the table that is most important. It was last updated sixth of March, and we might need to update it again this week and update almost every week. We have this in English and in French.



Global need of medical devices for COVID-19



1

List for COVID-19

For oxygen delivery in ICU.

physiological monitor multiparameter for ICU
infusion pumps / giving sets

- Oxygen concentrator
- Pulse oximeter
- Patient ventilator, for critical care
- Flow-splitter for oxygen supply
- Flowmeter, Thoracic tube
- Humidifier, non-heated
- Nasal prongs
- Catheter
- Oxygen mask
- Venturi mask
- Laryngoscope, adult/child
- Laryngoscope, neonatal
- Endotracheal tube
- Endotracheal tube introducer, Bougie
- Endotracheal tube introducer, Stylet
- Colorimetric and low CO2 detector
- Resuscitator, adult
- Resuscitator, child
- Crohnpharyngeal airway, Guedel, orotracheal, single use
- Nasopharyngeal airway
- Suction device
- Infusion giving set



2

List for COVID-19

Protective equipment

- Face shield
- Fit test kit
- Particulate respirator, grade N95 or higher
- Scrubs, tops
- Scrubs, pants
- Apron, heavy duty
- Gown
- Alcohol-based hand rub
- Bio-hazard bag
- Safety box
- Soap
- Gloves, cleaning
- Hand drying tissues
- Gloves, examination, non-sterile
- Mask, surgical - healthcare worker
- Mask, surgical -

In vitro diagnostics

still to define which tests, now in discussion Emergency Use Listing

- Triplic packaging boxes
- Viral transport medium
- Sharps container boxes
- Swabs
- Testing locally
- Testing shipped to reference lab with PCR
- Tests to be determined by WHO PQ EUL



3

Work to be done: increase availability of medical devices according to needs

Source: market

- Products that meet WHO specs
- Specs to be reviewed
- Reach to manufacturers
- Production? Supply? Quality?
- Source: database, manufacturer?
- Databases of products/ manufacturers/ contacts...

Needs - countries

- Health facility assessments
- Availability of
 - ICU beds
 - oxygen
 - oxygen delivery systems
 - Ventilators
 - CT scanners
 - Laboratories with COVID tests
 - clinical engineers

Solutions: who provides what

- Country lists matching needs with offers.
- Pandemic supply network
- WHO, WS, UNICEF, WFP, ...
- Link to source: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/operational-guide>
- Quantification modelling?
- Installation, training, supplies
- Sanitization, decommissioning...



4

Useful links

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance>

1. On protective equipment

Masks, gowns, gloves, number of changes and types to be used in the different settings.

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/protective-equipment>

2. Diagnostic (in vitro, imaging, RR, pulse oximeter, temperature)

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/diagnostics>

Therapy and monitoring: oxygen delivery systems for primary care and for hospital

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/therapeutic-and-monitoring-devices>

Disease control package

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/disease-control-package>

List of equipment required



WHO needs to provide to countries: (from some of you..... to other like you)

Personal protective equipment

- Specifications
- Use and decommissioning
- standards
- Diagnosics, (in vitro, imaging, RR, pulse oximeter, temperature)
- Respiratory rate monitors
- CT
- X Rays,
- Ultrasound

Oxygen, ventilation and intensive care unit equipment

- Technical specifications and know which ones match the WHO ones. Support to determine specs, translate to other languages.
- Ventilators, training courses, in various languages, maintenance tips
- Tubeshield
- good quality that have been approved for use by regulatory authorities.
- Other applications that can support diagnostics/ follow up/ monitoring of COVID patients.



Next steps

Discussion groups

1. Suggest to have an online discussion "Infrared" to disseminate information and to support colleagues on COVID issues
2. CED WA group
3. Information to be sent to who medinf@who.int
4. CED COVID videos around the globe (similar to the CEDDAY)

Organize information to be published by WHO

- Help to harmonize information, organize so that WHO can place it website:
1. WHO Lists of device by categories: needed by ICU, Diagnostics, PPE, in different languages
 2. List of training tools: for ventilators and ICU devices, links
 3. Provide manufacturers database to symmetric so that they can place in their database and it is public
 4. Help WHO review technical specifications. (will be sent to all who would like to comment) and if you have specs., please share.
 5. Respond the WHO country surveys, to collect needs and available resources in countries. (link will be sent in few days)

2. Technical specifications for procurement, related equipment needed for COVID..

<https://www.who.int/medical-devices/links/procurement-consultation/>



<https://www.who.int/medical-devices/links/consultation-on-modern-ventilators/>
English, French and Spanish

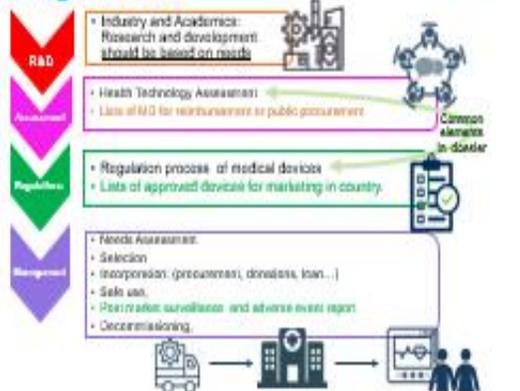
<https://www.who.int/medical-devices/links/consultation-on-ventilators/>
English, French and Spanish



7

8

To ensure improved access of safe, quality medical devices during COVID-19



9

Dear Clinical Engineers: Remember a patient is at the end of all our activities, they deserve our

Technical knowledge

Passion

Honesty

Hard work

To ensure that Medical devices should be:

- Safe
- Good quality
- Easy to use
- Easy to maintain
- Adaptable
- Affordable
- Available
- Accessible
- Acceptable

Together we can kick COVID-19 out!

10

Gracias
Thank you
Merci
Shokran
Xie xie
Spasiva

World Health Organization

WHO
25, Avenue Appia
1211 Geneva
Switzerland
info@who.int
www.who.int

11

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/>

World Health Organization

Rolling updates on coronavirus disease (COVID-19)

Updated 25 March 2020

12

- Disease Commodity Package (DCP): [https://www.who.int/publications-detail/disease-commodity-package---novel-coronavirus-\(ncov\)](https://www.who.int/publications-detail/disease-commodity-package---novel-coronavirus-(ncov));

- So, the idea here is that we put everything together. The things that are needed for surveillance and all the handbook for epidemics and all those things are linked here.

- So you can go into there and then there is the survey as for example, this is a sample collection (once we have more devices for diagnostics, we will put them here as soon as they are available).
- Then for prevention control. And then we have PPE's, oxygen concentrator, the pulse oximeter, the flow meters, etc.
- And we have the links to the next cell of the table where these are the links to our books, you can go and be able to relate what is it about.
- These we also have the standards that they have to comply. **We need volunteers to review all this information.** And then we need to have them translated and to share them with the ministers of health in different languages.
- Another thing that we need help is to provide a **very quick input for a treatment center**, what are the equipment that should go inside, where should not go, etc.
 - I suggest that we have like different groups of people, the ones that can help us on the market and with manufacturers, the ones that can help us on this text, and the ones that can help us on training and maintenance of a ventilator.

Ale Velez (CE consultant with Adriana): I am working in the Operations Support and logistics group in emergency for WHO. **Alejandra Velez WHO email:** velezuigaitanla@who.int. See <https://www.who.int/publications-detail/critical-preparedness-readiness-and-response-actions-for-covid-19>

- So I want to compliment what has been done so far. Today was released the first version of the treatment center.
 - It's a proposal to build tents. And it has separated the moderate cases from severe cases.
 - What we're missing in it is how we plan to adapt the ICU because it was an extension of what was done in Africa with Ebola treatment centers.
 - But now that we are planning to have new equipment, like ventilators we are discussing every week and we really have like a plastic separation walls between patients etc.
 - So this is one of the things that was released officially today and we need inputs on the innovation and the implementation of the equipment, especially pricing.
 - And other thing it's a survey on the oxygen capacity and reallocation of equipment in health facilities.
 - As you know, the problem of banning borders is not only for transport and procurement of equipment, but also of sending people for training and installation of the equipment.
 - So, one of the things we are also trying to work on is to have online trainings and online troubleshooting guidance for the people that are in use of this equipment and this is cleaning disinfection and sterilization of the items for oxygen therapy.
 - Because initially we were trying to propose all single use, but as we have been facing problems with the market, we need to start using the reusables.
- The other thing is about the technical aspects (we already have the draft and the idea is to send for review), but as you see in the DCP most of the standards that we have proposed are the ISO standards and we need is also equivalents to the standards in China.
 - for example, because in the supply chain what I received is the offers from China mainly.
 - And it's very difficult to know about the quality or the to print the brochures in Chinese, etc.
- We also finished yesterday a quantification tool that includes the human resources.
 - It's a very interesting tool that will be also publicly available.
 - It includes human resources and the oxygen calculation needs.
 - For these I am actually searching for someone that is a specialist on it and can help us to make different scenarios according to the oxygen source, if it's going to be from the facility source, from the tank or from the oxygen concentrator.
 - We have already the device list, not only the one on the DCP but with other details for example, for endo-tracheal tubes and we consider the laryngeal mask as an alternative.
 - This was prepared initially for WHO procurement, but we can also share the specs are there and we need to review also that we are covering a broader range or suppliers and we are ensuring safety and quality and we can circulate all this information

2. COVID19 Q&A with Adriana

1. **Roberto Ayala:** Good day. One thing that hasn't been discussed enough is HOARDING of devices. Something needs to be done to send a strong message to those who are hoarding devices and equipment to increase their cost (**Tom:** hoarding is people setting things aside in anticipation of a later need, so that people may need them now).
 - a. **Adriana:** yes, absolutely. It is. The major thing is that whatever is available, we need to use it. We cannot just be exculpating with things because there are really needed everywhere.
2. **Nicolas Pallikarakis:** Thank you Adriana, to whom we should send comments and suggestions to update the DCP V4 to not overload you?
 - a. **Adriana:** Now any comments or suggestions to the DCP you can send to medical devices email in WHO.
3. **Cathy Blanc-Gonnet:** Last week was very busy with the provision (free loan) of all the equipment relevant to the crisis that we had in our warehouse: ventilation, monitoring and infusion equipment. It's kind of the world upside down since it is the French public hospitals that turn to our NGO for second-hand equipment...
 - a. **Adriana:** Quick story: last Friday night, Ale and I requested information for some Chinese intellectuals that we were offered to WHO and over the weekend 80 hospitals in China, thanks to Tom and especially Yadin that send a message to our Chinese CE colleagues, they all responded! People in WHO were amazed, they couldn't see how we got this response in just a weekend from friends and colleagues from China. So, I really want to acknowledge that this network can be very, very powerful and can actually help us in daily work Ale and me, in WHO because our work is very, very difficult. And we have many people against and, and well... many things that are difficult.
4. **Yadin:** can you make comment about WHO stands on Compliance of rapidly build device with national standards and regulations
 - a. **Adriana:** We're having a problem with that because now it happens that the pharmaceutical perform industry wants to do alcohol-based hand rub, the sports want to do PPEs, the car companies want to do ventilators. So, we do listen to that, but we're also very worried on the quality and safety of those devices or those products. We still would like to make very sure that everything that's developed by whoever it complies with basic standards, safety and standards of quality. We cannot just put any device or anything to any person because that would go against to everything that we have been supporting. We're moving from the PCR now to other types of tests and these will be announced because the FDA just cleared some this week.
5. **Nicolas Pallikarakis:** Can we upload the translations to our site -INBIT- together with translations of training courses of WHO?
 - a. **Adriana:** Yes. If anybody can put translations in your sites that will be marvelous. So take up information from WHO if you want to translate you can put '*translated from WHO*' and if there are some important issues send them to us so that we can also announce them.

6. **Giuseppe Fico:** Hi from Madrid, many initiatives are in place to 3D print PPE visors using PLA, many hospitals are requesting this in Madrid and in Spain, is there any recommendation about what NOT to do and if no tests are needed before giving them to HC professionals? Please count on my research group for any translation in Spanish.
 - a. **Adriana:** We'll take care what NOT to do because many people are improvising and then this could result to a bigger problem.
7. **Bassam Tabshouri:** Need access to sources of flow and pressure sensor and other items to develop ventilators... Is assembling locally instead of manufacturing also a possible option? If yes what companies are ready to do that.
 - a. **Adriana:** Not understood this question and will come back later.
8. **Roberto Ayala:** Also, checking with devices manufacturers availability is not enough because there's a huge secondhand market that also have capacity to cover emerging necessities.
 - a. **Adriana:** Yes, Roberto, we're taking that also. We're taking first with manufacturers then with distributors and then if there are others that can help, it could be good. I think we really need to cover everything available. But as long as they're good quality and as Ale was saying, people cannot travel to train them. So we also have to have all these training tools online.
9. **Yadin:** Also add to your list the required test equipment like Vent analyzers, IV pump tester. pulse Ox testers etc.
 - a. **Adriana:** Yes, that would be a very good idea to us like a toolkit for biomedical engineers, clinical engineers and also for the technicians and so to be able to state what are the kind of items that you need in a clinical engineer shopping site up in a hospital, that's a very clever idea.
10. **Fred Hosea:** <https://www.thomasnet.com/articles/top-suppliers/medical-ventilators-manufacturers-companies/>
 - a. **Adriana:** Thank you. So if somebody can help us retrieve all the information about manufacturers and we have already at place (it's a huge database)... they're willing to receive any information that we have on manufacturers and they are going through a daily update. And that will include all manufacturers from all around the world and they will give us that Excel table for free. **Tom, please send it now to everybody.**
11. **Tazeen Saeed Bukhari:** Can you connect to exhibition organizer like Arab health and Medica and many more to get a list of all manufacturers
 - a. **Adriana:** We're connecting through the World Economic Forum, the world customs agency, the World Trade Organization, because many of them, they have already these manufacturers. So, we're reaching out, but if you receive any of these calls or surveys, please send it out to others.
12. **Claudio Meirovich:** We got a list of suppliers from ECRI
 - a. **Adriana:** Yes, if you can give it to us, that would be good. But we want to link correctly with ECRI so that we don't think that we're taking their information from them, but maybe having a chat with them.
13. **Tom Judd:** We will add all who request access to the WhatsApp group. Its purpose is to have a few leaders from each country involved who can pass on these messages as appropriate to their country network
14. **Yadin:** Thank you Adriana for recognizing China CE's efforts
 - a. **Adriana:** Like maybe as Yadin was organizing this CE Day that started with China I suggest exactly to do the same thing, but with COVID 19 related issues, medical technology related issues for COVID 19, so that we can start learning from our Chinese colleagues. What did they do? What were the challenges they face? How did they manage? To put the ventilators to create the intensive care units in the corridors in prehospital rooms, etc? How did they manage the procurement and the training for them, and then we can go through all the all the other countries so as to reach out the countries that are suffering now in Europe mostly, and then going to preparedness for Africa and Latin America. So I really would like Yadin, if we can set that up on a Saturday or Sunday that people don't have to work.
 - b. **Yadin:** Yes we will do a Global COVID19 CE Day very soon.
 - c. **Tom:** we'd like to get that out sooner rather than later. And so maybe even in the next two, three weeks' time is desirable.
 - d. **Adriana:** The sooner, the better
15. **Roberto Ayala:** Beer Brewing companies are making antibacterial gel!
 - a. **Adriana:** That's wonderful.
16. **Claudio Meirovich:** Argentina Biomedical Association made a statement on this... In Spain the SEEIC is trying to make sure all tests are done for equipment designed using 3D printers and others...
17. **Elliot Sloane** notes: Rapid safety testing of related devices, systems, and accessories; availability of appropriate supplies, accessories
18. **Stefano Bergamasco:** Our association is going to publish 5 or 6 checklists for safety checks of the most relevant devices in this Emergency situation, with the basic, but most necessary checks to be done before installation approval
 - a. **Adriana:** I think we have to go very simple with checklists & not cumbersome tables, but really like a little table & can go to a more detailed table.
19. **Tobey Clark:** Will work on video training for LTV, Drager vents. Also, review test equipment vent testers, O2 analyzers, flow meter suppliers. Vent PMs on Drager and LTVs
 - a. **Adriana:** yes, if you can have that will be marvelous.
 - b. **Tom Judd:** Symmetrics, a USA company is combining public databases to assist Adriana
 - c. **Calil:** Tobey, will you spread such videos to all that want them? **Tobey:** Hope to put the videos on YouTube
20. **Lucio Flavio Brito:** It is important that we are at home, but it is important to consider that natural ventilation is an important defense tool. For those who wish to study more about aero-biocontamination see the link <https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5417a1.htm> TB transmission is very similar to covid-19. AIIRs are single-patient rooms at negative pressure relative to the surrounding areas, and with a minimum of 6 air changes per hour (12 air changes per hour are recommended for new construction or renovation).
21. **Mladen Poluta:** I heard from a colleague today who says that the view is of WHO and the CDC is that COVID 19 is not air-borne. And that for me is a huge question and a very important point that needs to be clarified if there is this perception that we only need to worry about surface disinfection. I think we are missing huge opportunity in not applying whatever what we have learned from air-borne confront for TB. Lucio comment: ventilation (natural and/or mechanical) very important as is UCGI/GUV - not just in hospitals but in all congregate settings incl. public transport - think AIC for TB
 - a. **Busola Oronti:** Please I wish to clarify whether COVID-19 is now airborne. I read somewhere online that WHO declared that the Virus could stay airborne for 8 hours under certain conditions
 - b. **Adriana:** Every other day there is a conference with the general director from WHO about the issue of the of the virus staying in the material, hat is a huge one, I'm really glad that you're talking about these because the virus can stay for days. And if we don't clean surfaces from hospital it is a major issue of infection. But we can update on that information. As soon as it becomes totally confirmed, but there's nothing over.

22. **Antonio Hernandez:** Congratulations for this presentation of the scenario on how you are dealing with the pandemic. But I have two comments with regard to these. The first one is we are in a pandemic, right in the middle of the crisis, and we hope that it will stabilize and then fade out. What you are presenting mixed almost everything, but we need to deal with the crisis and people/countries need to know of everything is needed that is a priority. Do we set apart so it's kind of a split all these elements, however, countries are not in the vacuum they have hospital and they have supplies and they have equipment. The scenario you present will help them to regroup these, but probably what is more important is what we need during the crisis and what will be needed during the recovery time. The second comment is related with donation. Countries has started to ask for donations, and they need some orientation and WHO have those guidelines. So I think that should be part of the process for them to get what is really useful for dealing with the pandemic. And last, something that I am right now doing is using kind of an information support network for elders, dealing with the WHO, PAHO retirees, and giving support, advice and information through these type of social networks.
- Adriana:** yes, I think one thing is we need to focus on the crisis and the other is the recovery. But for the crisis, we need to know these manufacturers and reach out to them. It's really because we need to send equipment and we have no equipment. I understand that maybe it would be good to have a way to prioritize. Thank you.
23. **Ashenafi Hussein:** Is there any strategy or way forward to have everyone in each country tested with test kits? There is always a fear of the unknown people thought it really accelerate to transmit.
- Murad Sabeeh:** in rural areas without PCR testing, which device can be as alternative to diagnose Covid 19 in that area?
 - Yadin:** In the Global Clinical Engineering Journal we just published scientific article comparing the rapid tests types; <https://www.globalce.org/index.php/GlobalCE>
 - Tom:** No, we're not there's not enough test kits probably for everybody in the country to be tested.
 - Adriana:** Correct, there is not enough tests for anybody. We cannot do the test everywhere. And even if the commercial tests become available, they will take time to be deployed. There is no way we can test everybody. It's impossible. So that's why when the first thing comes, then you have to ask and that's why I'm asking for maybe thermometers, respiratory rates, pulse oximeters other ways to measure while you get lab tests.
24. **Tom:** See <https://www.niid.go.jp/niid/en/2019-ncov-e.html>.
25. **Beatriz Galeano & Nelson Escobar (Colombia):** offer help to translate material to Spanish.
26. **Cathy Blanc-Gonnet:** HUMATEM: Please add me to this volunteer list Adriana suggests for some help in French translation. Thank you very much Adriana.
27. **Fred Hosea:** As disasters strike, many primary clinical roles are being radically changed. Intensivists are shifted to hospitalists; hospitalists are shifted to call center triage, etc. Clinical Eng. need to consider what would be the best combination of primary and secondary roles in the wider system of needs in disaster conditions. Being proactive will help reduce confusion and messy improvisation.
28. **Rossana Rivas:** in the router is starting the discussion about what is the best kind of test to define to consume them the virus that they cease. Recently we have made the *sobaho*, which is the traditional way to test takes some days and recently the government bought a number of rapid tests. Here is the discussion which is the best or this investment is really a waste of budget, which is now highly required. What is the position of WHO Adrianna?
- Adriana:** No, first of all, we are assessing the diagnostics that are commercially available right now. The number one was the swap from respiratory and then you seal it and you send it to the reference laboratory. And then that's the way it's done in most countries using PCR technologies with a specific protocol that was created when the CDC, the WHO, the German one, but now commercially available tests will be available, and these would be maybe in the next week. So as soon as they become available, there will be recommended in the emergency use list from WHO, but the FDA has already cleared some of them.
29. **Adriana:** I would really recommend if there's any possibility that we can have a volunteers' list that Tom may collect. And maybe I suggest that we have maybe another call similar to this in three weeks' time, and then in the meanwhile, send the links in internet so that people can update. But it's really to dive in & talk to tell us what would you think would be the best way forward.
- Tom:** we will follow-up with the List making immediately and certainly schedule the follow-up meeting in the next 3 weeks.
30. **Adriana:** Thank you very much, everybody. And as Yadin says, **together, we will make it.**
- So we need to stay together, we need to share information and be able to get to where we want. I will put there this Excel table and I'll send it to Yadin and Tom so that if any of you wants to write your names on there, each of the topics so that then Ale and me, we'll just be contacting those, and not contacting everybody for everything because that will be really difficult.
 - No, but I think we have to share our knowledge with everybody, and really big solidarity with those clinical engineers that are really in very difficult times today, like Paolo Lago for example. And, of course, our Chinese colleagues. So thank you very much, and looking forward to working with all of you.

3. CED B&C Issues

1. Other COVID19 Resources

- CED Website** – see <https://ced.ifmbe.org/blog/covid19-resources.html> with many growing resources in several languages; Luis notes: if you have a resource to post, please pass on to info@ced.ifmbe.org
- AIIC:** Adapted from the AIIC website, see www.aiic.it/covid19
- WhatsApp group:** CED has also set up a CED Notifications group – deliberations from the group for March 1-25 provided; you are welcome to join CED's WhatsApp group. forward your mobile phone number to Kallirroi and me.
- INFRATECH:** Bill Gentles noted the following way to also join INFRATECH, an international CE-HTM Listserv, and another way Adriana wants to communicate with the CE-HTM community now. To participate in INFRATECH discussions, send the following message in the body of an email: subscribe infratech John Smith. (Substitute your own name for “John Smith”) Send this message to the following address: LISTSERV@LISTSERV.PAHO.ORG

e. How are others sharing resources?

- i. **Maombi Edison (DR Congo):** MOH unit now set up; Maombi helping MOH to determine needed COVID19 resources
- ii. **Fred Hosea (Ecuador):** Brainmap tool: he is collecting a systems view to the challenges we are facing, including Adriana's lists tpdau; Fred to send video explaining tool's use, see below. tangofred@gmail.com
- iii. **Brad Schoener (AAM):** Resources: <https://www.aami.org/news-resources/aami-coronavirus-updates/coronavirus-resources-for-the-field>
- iv. **Fred:** be ready for CEs to assume different roles during the crisis
- v. **Mladen:** His country (South Africa) now in lockdown; gathering COVID19 related equipment & supplies; thankful for WhatsApp group

