

Flying Aid Nepal (FAN) July 2021

Guidelines for FAN support to health facilities in Nepal in connection to Covid-19 third wave in 2021

The infection rate in the cities and lowland is higher than remote places due to higher population density, but on the other hand the situation in remote places are more critical due to the infrastructure. While the access to health facilities in the cities and lowland are increased due to governmental and external support, much less has been provided to the remote places. There the medical staff has only basic or almost no education, so even they are trying their best, they and their health posts are dysfunctional. All the local institutions must ship their patients further in the system, or they must prioritize the utilization of their meager means to those who have the highest chance of survival. Even sending the patients further, often only leave them isolated from the family, dying alone. Many prefer taking the chance locally. Survival of the fittest.

What we can do from Danish NGO side is giving the local level more access to relevant treatment and protection, so more people can decide staying locally and take the chance close to family instead of being deserted at an unknown place. We shall not underestimate that the feeling that someone from far away is giving them "lifesaving" equipment really means a lot mentally and make them feel safer. Whatever we do, not all will survive.

The health facilities in Nepal are divided into categories:

Category 1: Is regular national Hospitals which have access to full ICU care with ventilator, which anyhow can be limited in number in the current situation. In stressful situations long term ICU treatment is regularly interrupted due to evaluation on success rate between current and incoming patient. They have access to oxygen stations for stable flow and refilling of cylinders.

Category 2: District Hospital which in the current situation are upgrading with few full ICU facilities, but anyhow too few to support the increasing number of severe covid situations. Regularly the staff are not fully educated in operating the ventilators. They have oxygen concentrators and cylinders but regularly far away from refilling plants. Regularly it takes 4 days to get refill. Therefore, they prefer referring severe patients to Cat.1, or they must give up and in stressful situations giving up too early.

Category 3: Municipality Level Health Post are in the current situation trying to upgrade with oxygen concentrators and cylinders, but are not always confident about their own capacity, and therefore tend to send patients for higher category as early as possible. Cylinders will be time-consuming to refill, so the most practical option to provide oxygen therapy is by concentrator.

Category 4: Ward Level Health Post only in few cases have any equipment whatsoever to treat covid patients, as well as the staff has very basic knowledge. If they have road access, they should have at least a small oxygen cylinder for transfer of patients. Regularly they do not have sufficient electricity to run a concentrator, but if they have, then they should have one, to give it a try, if upper categories are occupied or not available.

Category 5: Village Level Health Post is very basic in all respects, but it should be considered to give them an option for basic oxygen therapy, especially if they have no road access.

Village Clinic: regularly a private run clinic with a basic support from municipality. They have no access at all to covid treatment and should not have.

Diagnostic measures: The most important diagnostic is an evaluation on sight. Coughing. Dry throat. Fever, hot skin, or shivering. Fatigue. General aching. Diarrhea. Running eyes. Loss of smell and taste. Headache. Later breathlessness. Chest pain. It is available for anyone and should be evaluated by the inflicted person or the family.

Pulse Oximeter can show the current oxygen level in the blood, but the reading can be imprecise due to thick or black skin. The real benefit in covid-response is continuous reading to follow the alteration in blood oxygen, decrease and increase, which can be monitored and evaluated by any health worker. The diagnosis can be any condition in respiratory and circulatory system, not only covid, but the treatment is the same, oxygen therapy. It gives less meaning to distribute among common people.

Thermometer: The thermal gun can be used by any health worker as it can give a hint on the body temperature on distance without contaminating the equipment. It can be used by common people too but limited due to the price. There are various types of digital thermometers available in the market which gives reliable body temperature. The temperature can be easily measured by placing thermometer in the axilla. The difference in axillary temperature and rectal temperature is about 0.3 to 0.5 degree Celsius.

Antigen and antibody testing can be supportive if medical staff wishes to have a conclusive diagnosis. There are more false positive than false negative reactions, so a reaction on coronavirus is relatively conclusive. Mass testing gives no meaning unless specified groups are tested with few days' interval, groups with suspected individuals or groups in special risk. A test on a random group on a random day is rather a waste of precious and expensive equipment.

Treatment of covid patients shall be done only by medical trained staff.

Oxygen Concentrator: only need continuous and stable electricity to give a constant flow of oxygen. With a consumption of 350 W the small machine can give up to 5 liter per minute and the bigger need 600 W to give up to 10 liter per minute. It is enough with a nasal tube for those who are not severely attacked, but a lot of oxygen will be wasted. More oxygen will be utilized if breathed through a mask which is not fitted tight to the face. For those who have a more decreased oxygen level, they need a higher pressure on the air flow, than the concentrator can provide. The pressure of air flow from both machines can only be 2 to 5 cmH₂O. With a tight fitted mask, the patient with high respiration rate has a risk to accumulate CO₂ in the mask which is dangerous for the patient, so this tight mask shall be avoided together with the concentrator alone.

Oxygen Concentrator Humidifier usually is part of the machine, but if not, it should be connected to the airflow when the oxygen is given for long time under pressure in a mask, to prevent excessive dryness in the airways. When given in nasal tube at low pressure it is not necessary. The water in use must be distilled, demineralized, or purified water. To disinfect the water and bottle during long term use there can be added a few drops of hydrogen peroxide.

Oxygen Cylinder can give much higher oxygen flow than the concentrator and a much higher pressure in a tight full-face mask. By continuously monitoring the patient by experienced staff the flow can be adjusted to the need of the patient. But there will be a risk that the flow will not follow the actual need of the patient. The main disadvantage of cylinders is their access to be refilled. Cylinders for treatment should be as big as possible, for instance 40 liters, while cylinders for transfer of patients can be smaller, for instance 4-7 liters.

CPAP Machine (Continuous Positive Airway Pressure) sends a steady flow of ambient air into a tight-fitting full-face mask. The flow can be regulated between 4 and 20 cmH₂O which is up to 4 times more than the concentrator alone. CPAP Machine as a standalone can be used in initial stages of Covid giving a higher pressure of atmospheric air. If more oxygen is needed, it can be connected to an oxygen concentrator, which also itself produces a pressure. This over pressure can expand the upper airways slightly, increase the oxygen uptake of the lung cavity during inhalation, and give a counterpressure when exhaling. Long term use can cause dryness in the airways, so it should be connected to a humidifier. If the covid is progressing, the machine can be connected to the higher oxygen pressure from oxygen cylinders. But all in all, the involvement of CPAP Machine is approaching the ventilator treatment. It must be followed continuously by measuring with the pulse oximeter. Only educated medical staff shall operate the machine, or at least staff which has received sufficient training, as there are several possibilities of mishandling, which can worsen the condition of the patient or even lead to death.

BPAP Machine (Bi-level positive airflow pressure) sends an airflow like the above. One pressure for inhaling and a lower pressure for exhaling. It can stimulate the respiratory rate. The high pressure can range from 12 to 35 cmH₂O, and the low pressure should be 8 cmH₂O less. Should be connected to a humidifier. Setting the pressures can be complicated and only special trained doctors or nurses should operate it. This is very close to ventilator treatment. The price is around the double of above CPAP machine.

Full Mouth and Nose Mask is crucial to maintain the air pressure in the respiratory organ with above equipment. It must fit the face without leaking. The common in the market masks only have one rubber strap and somehow hard plastic which probably cannot keep the mask tight all the time. As a minimum the mask shall have FDA approval/CE-mark for CPAP. A more flexible mask with strong double bands should be procured. To avoid loss of oxygen and avoid accumulation of CO₂ an oxygen mask with reservoir bag can be considered, as well as Positive Expiratory Valve (PEP). But as a whole, all those considerations shall only be done by doctors with special knowledge about oxygen therapy.

Ventilator treatment is only to be performed by doctors with special knowledge about oxygen therapy.

Nebulizer is not indicated for covid treatment as it generates aerosol and while used in covid patient, it may hold greater risk of transmission to other patient and health personnel or care giver but could be for other respiratory ailments. Basically, the nebulizer is used for dispensing aqueous medicines directly into the lungs. Also administering of sterile water into the lungs to dissolve mucus is an indication. But in covid there are no mucus to remove, and no direct medication is indicated.

Medicines are not needed for an uncomplicated covid situation.

Corticosteroids can prevent an immunologic overreaction towards the virus, but it shall only be prescribed by qualified medical personnel. There is various evidence which show corticosteroids to be effective in covid pneumonia, but it should be only used in moderate and severe cases by qualified medical personnel as it has potential adverse effect on the immunity of the patient. Longer use of steroids makes patient immunocompromised and vulnerable to other opportunistic infections like fungal infections which can be life threatening. Giving it for volunteers and laymen to distribute shall be out of the question.

Antibiotics shall only be given if the covid is complicated by bacterial infection and only by prescription by qualified medical staff. Uncritical distribution by volunteers and laymen shall be out of the question.

Both can increase the risk of being attacked by Black Fungus, especially if the patient is suffering from diabetes.

Other medicines shall only be given on prescription by medical staff in actual situations.

Food and vitamins is 2nd important thing in covid infections after Oxygen therapy. As covid is viral infection it drains the body energy and immunity which makes the patient very weak to fight against the infection. Healthy diets are important for supporting immune systems and help to recover faster. It should be possible for health institutions to prescribe nutrients to patients.

Isolation and care facilities of Covid-positive cases shall be arranged by the local authorities but from FAN side there could be support in question to provide equipment.

Bed and bed gear. Steel frame beds can be disinfected and should have variable elevation of the upper end. Mattress, pillow, quilt, and linen shall be wash- and disinfection-able. Rubber sheet should be available.

Personal Protection Equipment (PPE) to be used by frontline personnel is distributed by government but extra could be in need. Re-useable suits, rubber boots, shield, gloves, and mouth band should be preferred to keep the costs low. In that case also disinfectants shall be available.

Disinfectants shall be used to clean PPE and to disinfect surroundings with covid patients. But spreading all over places is not an indication.

Hygienic articles among which only soap is really in need. Toothpaste, menstruation bands and other articles is not connected directly to an acute covid situation but could be indicated in isolation situations.

Food and vitamins: The shortage of nutrients are severe effects of covid lockdown especially for marginalized groups and dayworkers. In first wave as well as second wave it occurred in spring when agriculture was still not reaching harvest. During none of the lockdowns the government had advised the population to store up anything. But now we are approaching third wave, where those who can, should prepare themselves. It should not be a task of FAN to involve in a general distribution of food. In case it is really prove necessary it should be limited to provide rice only, to prevent from starvation. Other nutrients can be delayed as they in the short run is not necessary to sustain life.

Administration and salaries: FAN can only support those organizations which can cover those expenses on their own. It can be governmental or non-profit. We only can support with the equipment which is necessary and unavailable within the economic frame of the local health institution or organization. In FAN we expect the local people, who have capacity and ability, to provide volunteer service for their community.

Communication can only be covered in special cases. The organization usually already have their Wi-Fi or recharge cards covered.

Transportation can be covered in some extent, where the organization are not able to cover it themselves or the expenses are huge to reach an outpost in need.

Radiobroadcasting, loudspeaker advertisement, flyers, etc. should be expected to be part of the involved producers volunteer work and shall not be covered by FAN.

Prevention mainly involves hygiene, distance, coughing into clothes and wearing protection on mouth and nose. In this stage of the pandemic, it should be generally known and perform.

Vaccines are the crucial preventive measure to be taken. In FAN it is very difficult, rather impossible, to work on. In the pandemic situation right now, the vaccines are dealt with by high level government and UN/WHO, so FAN is a too small player in that game. Later if vaccines will be more freely available, the need will be in huge numbers which is beyond the economy of FAN. Even FAN represents a wide network, it is probably not strong enough to influence the higher levels in Denmark, but it could be an option later on if a surplus of vaccines should show up in the national vaccination program.

On behalf of Flying Aid Nepal
12-07-2021
Kurt Lomborg