We are a group of experienced and accomplished specialists in critical care medicine. Based on our rapidly accumulated clinical observations in the care of COVID-19 patients from within our own ICU’s and from colleagues across the world, we have identified the three core pathologic processes that lead to multi-organ failure and death in COVID-19:

1) **Hyper-inflammation (“Cytokine storm”)** – a dysregulated immune system whose cells infiltrate and damage multiple organs, namely the lungs, kidneys, and heart. It is now widely accepted that SARS-CoV-2 causes aberrant T lymphocyte activation resulting in a “cytokine storm.” Lymphocytes are white blood cells that produce cytokines. Cytokines are inflammatory proteins that damage the host when produced in excess.

2) **Hyper-coagulability (increased clotting)** – the dysregulated immune system damages the lining of blood vessels (endothelium) and activates blood clotting, causing the formation of micro and macro blood clots. These blood clots impair blood flow.

3) **Severe Hypoxemia (low blood oxygen levels)** – lung inflammation caused by the cytokine storm, together with clots in the pulmonary (lung) circulation severely impairs oxygen absorption (oxygenation failure) necessitating the need for oxygen support devices.

The above pathologies are not novel, although the combined severity in COVID-19 disease is considerable. Our long-standing and more recent experiences show consistently successful treatment if traditional therapeutic principles of early and aggressive intervention is achieved, before the onset of advanced organ failure. The treatment required consists of powerful yet widely available therapies as detailed below.

It is our collective opinion that the historically high levels of morbidity and mortality from COVID-19 is due to a single factor: the widespread and inappropriate reluctance amongst intensivists to employ anti-inflammatory and anticoagulant treatments, including corticosteroid therapy *early in the course of a patient’s hospitalization*. It is essential to recognize that it is not the virus that is killing the patient, rather it is the patient’s overactive immune system. The flames of the “cytokine fire” are out of control and need to be extinguished. Providing supportive care (with ventilators that themselves stoke the fire) and waiting for the cytokine fire to burn itself out simply does not work... this approach has FAILED and has led to the death of tens of thousands of patients.

The systematic failure of critical care systems to adopt corticosteroid therapy resulted from the published recommendations against corticosteroids use by the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC), and the American Thoracic Society (ATS) amongst others. A very recent publication by the Society of Critical Care Medicine and authored one of the members of our group (UM), identified the errors made by these organizations in their analyses of corticosteroid studies based on the findings of the SARS and H1N1 pandemics. Their erroneous recommendation to avoid corticosteroids in the treatment of COVID-19 has led to the development of myriad organ failures which have overwhelmed critical care systems across the world.

Our treatment protocol targeting these key pathologies has achieved near uniform success, *if begun within 6 hours of a COVID19 patient presenting with shortness of breath or needing ≥ 4L/min of oxygen*. If such early initiation of treatment could be systematically achieved, the need for mechanical ventilators and ICU beds will decrease dramatically.

**FLCC WORKING GROUP TREATMENT PROTOCOL**

- **Intravenous Methylprednisolone, 40mg every 12 hours daily x 7days (followed by a taper):** Methylprednisolone is a corticosteroid hormone that has powerful anti-inflammatory effects and dampens the cytokine storm.

- **Low-Molecular Weight Heparin, 1mg/kg every 12 hours:** an anti-coagulant medicine which prevents the formation of clots within blood vessels and secondarily promotes clot dissolution.
• **Intravenous ascorbic acid (Vitamin C) 3 grams every 6 hours:** a stress hormone that regulates the immune system, counteracts excess inflammation, has antimicrobial and anti-viral activity, and preserves endothelial barrier function and activity.

• **High-Flow Nasal Cannula:** delivers high fractions of oxygen that is heated and humidified, increasing blood oxygen levels while reducing the work of breathing and the need for mechanical ventilation. Particular focus must be placed on “permissive hypoxemia” strategies combined with prone/semi-prone positions to decrease oxygen requirements and avoid the need for intubation and mechanical ventilators.

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