

## Recommendations: Corticosteroid Administration in COVID-19 Patients

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### Acute Hypoxemic Respiratory Failure

#### Key Recommendations

- The Taskforce strongly **recommends** using dexamethasone (at a dose of 6 mg per day IV or PO for up to 10 days) in patients with COVID-19 who are mechanically ventilated. If a patient is discharged prior to 10 days of therapy, they should not be discharged on dexamethasone.
- The Taskforce **recommends** using dexamethasone (at a dose of 6 mg per day IV or PO for up to 10 days) in patients with COVID-19 who require supplemental oxygen via high-flow nasal cannula or non-invasive ventilation for acute hypoxemic respiratory failure or acute-on-chronic hypoxemic respiratory failure. If a patient is discharged prior to 10 days of therapy, they should not be discharged on dexamethasone.
- The Taskforce **recommends** considering dexamethasone (at a dose of 6 mg per day IV or PO for up to 10 days) in hospitalized patients with COVID-19 who require supplemental oxygen via nasal cannula for acute hypoxemic respiratory failure or acute-on-chronic hypoxemic respiratory failure if the potential benefits are deemed to outweigh risks, factoring in comorbidities, risk of progression, and clinical trajectory. If a patient is discharged prior to 10 days of therapy, they should not be discharged on dexamethasone.
- The Taskforce strongly recommends **against** using dexamethasone in patients with COVID-19 who do not require supplemental oxygen, but to not withhold corticosteroids in this group if there is a separate evidence-based indication (i.e., obstructive lung disease, refractory shock, etc.).

#### Rationale

These recommendations are consistent with the October 9<sup>th</sup>, 2020 update of the National Institutes of Health COVID guidelines. These recommendations are based on the results from the Randomised Evaluation of COVID-19 Therapy (RECOVERY) trial. RECOVERY was a multi-center, randomized, pragmatic, open label trial conducted in the United Kingdom. Sponsored by the UK National Health Service, hospitalized patients with suspected or laboratory-confirmed COVID-19 were randomized to one of several interventions.

One arm tested dexamethasone 6 mg daily, administered orally or intravenously, for up to 10 days (or until discharge, whichever is sooner). At the time recruitment was halted by the steering committee, 2104 patients were randomized to receive dexamethasone and 4321 patients to usual care. Overall, 82% of subjects enrolled were SARS-Cov-2 positive, and 91% of the invasive mechanical ventilation subgroup. As the Dexamethasone group was 1.1 years older (66.9 vs. 65.8 years), age-adjusted 28-day mortality results, stratified by level of respiratory support (one of the pre-specified analyses), are reported below. Randomization to dexamethasone was associated with a shorter hospital length of stay (median 1-day difference), increased likelihood of discharge within 28 days, and among those not on mechanical ventilation at the time of randomization, a decreased likelihood of progressing to use of mechanical ventilation. The overall mortality benefit appeared to be realized among those less than 70 years of age and those with more than 7 days since symptom onset.

The mortality benefits seen in the RECOVERY trial were consistent with the systematic review included in the critical illness-related corticosteroid insufficiency (CIRCI) guidelines and a recent multi-center trial of Dexamethasone for ARDS, both conducted pre-COVID-19. They are also consistent with a recent meta-analysis of corticosteroids in COVID-19.<sup>8</sup>

Respiratory Support	28-Day Mortality Dexamethasone Arm (N=2104)	28-Day Mortality Usual Care Arm (N=4321)	Age-Adjusted Relative Risk (95% CI)
No oxygen support	89/501 (17.8%)	145/1034 (14.0%)	1.19 (0.91 – 1.55)
Oxygen only	298/1279 (23.3%)	682/2604 (26.2%)	0.82 (0.72 – 0.94)
Invasive mechanical ventilation	95/324 (29.3%)	283/683 (41.4%)	0.64 (0.51 – 0.81)
All participants	482/2104 (22.9%)	1110/4321 (25.7%)	0.83 (0.75 – 0.93)

**Respiratory Failure:** See [Ventilator liberation, extubation, and cuff leak test COVID guideline](#)

### Key Recommendations

- For patients who are **not** already receiving corticosteroids, are assessed as ready for extubation, yet have a cuff leak test volume of < 110 ml, as those with 110 ml and above are considered passed, the Taskforce **recommends** using corticosteroids (at an approximate dose, equivalent to Methylprednisolone 40 mg IV) for two doses in patients with COVID-19 and then recheck a cuff leak test. See practice algorithm in the ventilator liberation, extubation, and cuff leak test COVID guideline

### Rationale

This prior Taskforce recommendation was based on several small trials that demonstrated reduction in re-intubation rates when serial doses of corticosteroids were administered prior to extubation among high-risk patients.

### Hemodynamic Support

#### Key Recommendations

- The Taskforce **recommends** using hydrocortisone (at a dose of 50 mg q 6 hours) over dexamethasone in patients with COVID-19 who develop refractory shock.

### Rationale

This recommendation is consistent with the Surviving Sepsis Campaign Guidelines and the Surviving Sepsis Campaign Guidelines for COVID-19. The recommendation is based on indirect evidence that time to resolution of shock and ICU length of stay are reduced in patients with refractory shock who receive corticosteroids.

## Pregnant Patients

### Key Recommendations

Consult ID and MFM for pregnant patients requiring oxygen therapy. The taskforce **recommends** using dexamethasone per the criteria outlined above for pregnant patients. If glucocorticoids are also indicated for fetal lung maturity (in discussion with MFM), give dexamethasone 6mg IM every 12 hours for 48 hours (4 doses) followed by dexamethasone 6mg daily to complete up to 10 days total.

## Patients on Chronic Corticosteroids

### Key Recommendations

The taskforce **recommends** continuing home corticosteroid regimen so long as the dose is greater than 6 mg daily of dexamethasone equivalent (see chart below). If the home steroid dose is less or equal to dexamethasone 6 mg daily, the taskforce **recommends** using dexamethasone per the criteria outlined above.

## Patients Who Receive Corticosteroid for Other Acute Indications

### Key Recommendations

In patients who receive corticosteroids for all other indications (i.e. obstructive lung disease, refractory shock, etc.), if the course of the corticosteroid is less than 10 days, dexamethasone per the criteria outlined above, should be prescribed to complete 10 total days of corticosteroids.

## Patients with Concomitant COVID-19 and Influenza Infection

### Key Recommendations

In patients who are concomitantly infected with COVID-19 and influenza, the taskforce **recommends** using dexamethasone in patients requiring mechanical ventilation. In patients with respiratory failure requiring any other type of supplemental oxygen, the taskforce would **consider** using dexamethasone.

Rationale: Retrospective studies<sup>9</sup> suggest a possible increase in mortality with corticosteroid use in influenza; however, randomized controlled trials<sup>3,6,7,8</sup> have shown mortality benefit and increased mechanical ventilator free days when corticosteroids are given to patients with COVID-19, hence the above recommendations.

## Resources

Steroids Conversion Chart			
Dexamethasone	Hydrocortisone	Methylprednisolone	Prednisone
0.75 mg	20 mg	4 mg	5 mg
<b>6 mg</b>	160 mg	32 mg	40 mg
7.5 mg	<b>200 mg</b>	40 mg	50 mg
10 mg	266.7 mg	53.3 mg	66.7 mg
20 mg	533.3 mg	106.7 mg	133.3 mg

## **References**

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