These guidelines are based upon medical literature review and expert opinion and are intended to provide recommendations for STEROID THERAPY in the care of critically ill patients.

**Best Practice Guidelines**

**Vasodilatory shock (septic shock, CIRCI, etc.) (1-3,7,10,13)**

- Hydrocortisone 200 to 300 mg IV daily (50mg Q6H or 100mg Q8H) for 5 to 7 days followed by tapering of dose as guided by clinical response
  - Avoid corticosteroid therapy in patients without shock, defined as those in whom fluid resuscitation and vasopressor therapy have restored hemodynamic stability
  - Continuous infusion at similar daily rate may provide better glucose control and may be considered
  - Response to ACTH testing should not be used to select patients for corticosteroid therapy
  - In general, adrenal crisis should be treated in this manner, regardless of the etiology

**Vasogenic cerebral edema (4)**

- Loading dose of dexamethasone 10 mg, and then 4 mg QID or 8 mg BID in patients with severe symptoms, daily dose of 4-8 mg in patients with mild to moderate symptoms
  - Intravenous route is preferred until symptoms have stabilized
  - Steroids are not recommended for asymptomatic patients

**COPD exacerbation (5-6)**

- Impending or actual acute respiratory failure - methylprednisolone 60 mg daily to QID
  - Intravenous administration may be preferable based on clinical scenario, but there is no treatment benefit over oral dosing
- For patients not requiring intensive care unit admission, prednisone 30 to 60 mg daily

**Glucocorticoid supplementation at time of surgery (8-9)**

- Should be limited to consideration in patients with preexisting risk factors for adrenal suppression, such as chronic steroid therapy
- Minor procedures (ex. herniorrhaphy) – hydrocortisone dose equivalent to 25 mg daily for the day of operation only, with a return to the usual replacement dose on the second day
- Moderate surgical stress (ex. cholecystectomy, joint replacement) – hydrocortisone divided IV doses equivalent to 50 to 75 mg on the day of surgery and the first post-operative day, with a return to the usual dose on the second post-operative day
- Major surgical procedures (ex. cardiac bypass) – hydrocortisone total daily dose of 100 to 150 mg in divided doses for 2 to 3 days, then return to the usual dose; the dose used on the day of surgery can be halved on post-operative day one

**Acute Respiratory Distress Syndrome (13-14)**
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- Methylprednisolone infusion of 1 mg/kg/day, tapered over 4 week period
  - More potential benefit in severe cases (PaO2:FiO2 <200)
  - Should be administered early in course of ARDS (in first 72 hours). Initiation of therapy after 14 days is not recommended and may result in worse outcomes

Background Information and Literature Review

Adrenal insufficiency is a generalized term that is often associated with any patient presentation involving hypotensive shock refractory to vasopressors and fluid administration. This may occur with or without evidence of infectious process or inflammatory condition. In these patients, the hypothalamic-pituitary axis is suppressed, but most cases are tertiary in nature, and short-term replacement of corticosteroids should be all that is needed. Therefore, it is reasonable in any patient with refractory hypotension to consider a course of corticosteroids, which can result in significant improvement in organ function and mortality in certain critically ill patients. However, numerous adverse effects have been attributed to corticosteroids. Immunosuppression, hyperglycemia and myopathy are some of the better-described causes of morbidity in critically ill patients receiving steroids. (7,10-13)

Most studies evaluating the effect of corticosteroids in septic shock used hydrocortisone in divided doses, although administration protocols and treatment durations varied. While one small prospective study showed less variability in blood glucose levels with continuous hydrocortisone infusions, the clinical benefit, from a mortality and shock reversal standpoint, remains unknown. In addition, there is no consensus regarding the optimal duration of treatment with corticosteroids. No large study has compared fixed-duration regimens to clinically guided regimens, or tapering to abrupt cessation. However, in one small clinical study, abrupt cessation was associated with rebound of hemodynamic abnormalities and increased inflammatory markers. Some experts advise administering five to seven days of therapy and a tapered approach to withdrawal that is guided by the clinical response (quickly following vasopressor withdrawal, or more slowly for a co-existent indication such as COPD exacerbation). (1-3,13)

Patients with ARDS may benefit from systemic corticosteroids, and the risk-reward profile with early administration (i.e. initiated within 72 hours of diagnosis) is favorable. Improved oxygenation and lower levels of inflammatory biomarkers are noted, as well as improvement in time to extubation. An increase in the number of complications has been seen in patients started after 14 days, however, so early administration is paramount. Long courses are typically prescribed, with methylprednisolone infusions starting at 1 mg/kg/day that taper after the first week. (13,14)

The optimal dose of systemic glucocorticoids for treating COPD exacerbation is unknown. Furthermore, the optimal duration of systemic glucocorticoid therapy is not clearly established and often depends on the severity of the exacerbation and the observed response to therapy. For patients with impending or actual acute respiratory failure due to a COPD exacerbation, most clinicians recommend using intravenous formulation at a higher dose, such as the equivalent of methylprednisolone 60 mg intravenously, one to four times daily, although outcomes data to guide this practice are not available. (5,6)

Since corticosteroids exert effects on almost every organ system, the clinical use of and withdrawal from corticosteroids is complicated by a multitude of serious side effects, some of which are life threatening. Therefore, the decision to institute therapy with corticosteroids
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should always require careful consideration of the relative risks and benefits in each patient. Corticosteroids should only be prescribed for critically ill patients with a precise indication and with attention to minimum effective dosage.

References


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**Approval**

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