

Definition of normal adrenal function in critically ill patients remains controversial, despite a large body of literature. Furthermore, evaluation of adrenal function in these patients is complex. A decrease in cortisol breakdown rather than an increase in cortisol production has been suggested as the main contributor to elevated cortisol levels in critically ill patients. The concept of relative adrenal insufficiency has multiple pathophysiological flaws and is not supported by current evidence.

Patients with septic shock who are pressor-dependent or refractory to fluid resuscitation should receive a short course of hydrocortisone regardless of their serum cortisol levels or their response to a Cosyntropin stimulation test (CST). Patients without septic shock who are suspected to have adrenal insufficiency should have their random cortisol levels measured. In patients with low and near normal cortisol binding proteins, a serum cortisol < 10 or 15 mcg/dL, respectively may trigger need for glucocorticoid treatment, respectively. Assays of free cortisol levels offers an advantage over total cortisol levels in patients with low-binding proteins. Most critically ill patients should have a normal random free cortisol level of >1.8 mcg/dL, although further studies are needed to define a normal range in critically ill patients based on both severity and duration of illness. A CST may be used to further evaluate adrenal function in patients without septic shock who have borderline random serum or free cortisol levels. The clinical presentation, diagnosis, and treatment of adrenal insufficiency in critically ill patients will be reviewed and discussed during the presentation.