

Weekly Pharmacy Pearl: Corticosteroid in ED – ED Pharmacist Perspective

Disclaimer: Please note the document’s goal is to present global guidelines and data. Not intended to sway clinical practice of CMC ED providers.

Properties, dosing equivalents and therapeutic indications of systemic corticosteroids, **relative to hydrocortisone**

	Equivalent Dose (mg)	Relative Glucocorticoid Activity	Relative Mineralocorticoid Activity	Duration of Action (hours)	General Therapeutic Indications
Short-acting					
Hydrocortisone	20	1	1	8-12	Even mineralocorticoid (MC) and glucocorticoid (GC) activity makes it suitable for use in adrenal insufficiency
Intermediate-acting					
Prednisone	5	4	0.8	12-36	High GC activity makes it useful for long-term treatment and as an anti-inflammatory/immunosuppressant
Prednisolone	5	4	0.8	12-36	Similar to prednisone
Methylprednisolone	4	5	Minimal	12-36	Anti-inflammatory/immunosuppressant
Long-acting					
Dexamethasone	0.75	30	Minimal	36-72	Anti-inflammatory/immunosuppressant Used especially when water retention is undesirable given its minimal MC activity Usually reserved for short-term use in severe, acute conditions given its high potency and long-duration of action

Table Reproduced from Liu D, Ahmet A, Ward L, et al. All Asth Clin Immun. 2013;9(1):30.

How to Utilize or Interpret the Table to Clinical Practice:

- Hydrocortisone has even GC and MC activity (1:1) → most physiologic corticosteroid
 - o Great for adrenal insufficiency caused by sepsis or other causes
- Hydrocortisone:Prednisone = 4:1
 - o Hydrocortisone 100 mg which is one of the common “stress doses” for sepsis is equivalent to 25 mg of PO prednisone
 - o If you calculate the total daily dose, 300 mg of total hydrocortisone is 75 mg prednisone per day
 - o Remember that this is likely used for patients being admitted for sepsis or septic shock and experiencing adrenal insufficiency
- Mild to moderate acute asthma or COPD exacerbation requires effect of anti-inflammatory and immunosuppressive corticosteroid, not physiologic replacement of depleted cortisol (which requires a big stress dose)
 - o 125 mg methylprednisolone = 625 mg of hydrocortisone = 156.3 mg of prednisone

- It is unclear where 125 mg IV methylprednisolone for respiratory disease derived from. Highly likely adapted from doses used for interstitial nephritis, transplant rejection, graft vs. host disease or other more serious inflammatory and immune diseases that require a huge dose of glucocorticoid.
- Per Global Strategy for Prevention, Diagnosis and Management of COPD: 2022 Report, evidence does not support prescribing more than prednisone 40 mg PO daily x 5 days.
- Per 2022 GINA Report, Global Strategy for Asthma Management and Prevention: 2022 Report, evidence does not support prescribing more than 40-50 mg/day x 5 – 7 days for patients that:
 - Fail to respond to an increase in reliever and controller medication for 2 – 3 days
 - Deteriorate rapidly or who have a PEF or FEV₁ < 6% of their personal best or predicted value
 - Have a history of sudden severe exacerbation

Tapering Steroid

- In general, the literature and various guidelines agree that corticosteroid use for < 2 weeks does not require taper
- The summary of evidence is:
 - Higher daily doses and longer duration of therapy are associated with a higher risk of HPA axis suppression, and the threshold is higher and longer than 5 days' worth of steroids from ED unless patients already have HPA suppression
- In general, tapering is needed for:
 - Prednisone ≥ 30 mg daily (or equivalent) for at least 2 weeks
 - Any dose of any systemic corticosteroid for at least 1 month
 - S/Sx of HPA suppression are already present

References

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