



## Ceftriaxone for Gonorrhea: IMplications of IV Dosing

The 2021 Sexually Transmitted Infections (STI) Treatment Guidelines recommend intramuscular (IM) ceftriaxone as the preferred therapy for uncomplicated gonorrhea.<sup>1</sup> Using the intramuscular route allows for ease of administration and is thought to result in therapeutic drug concentrations over an extended period of time. However, patients may receive a dose of ceftriaxone intravenously instead of intramuscularly. Do they still need a dose of IM ceftriaxone?

### How do IM and IV concentrations compare?

Ceftriaxone 500 mg – 1 g IM is the recommended treatment for gonorrhea because concentrations 24 hours after administration are greater than the minimum inhibitory concentration of gonorrhea isolates, which is the proposed target for efficacy.<sup>2</sup> However, data from the package insert shows that IV and IM serum and urine concentrations are similar over a 24 hour period (Table 1).<sup>3</sup>

**Table 1. Average Serum Concentrations of Ceftriaxone over 24 hours (mcg/mL)**

Dose	Route	0.5h	1h	2h	4h	6h	8h	12h	16h	24h
500 mg	IV	82	59	48	37	29	23	15	10	5
500 mg	IM	22	33	38	35	30	26	16	Not Determined	5
1,000 mg	IV	151	111	88	67	53	43	28	18	9
1,000 mg	IM	40	68	76	68	56	44	29	Not Determined	Not Determined

**Table 2. Average Urine Concentrations of Ceftriaxone over 24 hours (mcg/mL)**

Dose	Route	0 – 2 hr	2 – 4 hr	4 – 8 hr	8 – 12 hr	12 – 24 hr	24 – 48 hr
500 mg	IV	526	366	142	87	70	15
500 mg	IM	115	425	308	127	96	28
1,000 mg	IV	994	855	293	147	132	32
1,000 mg	IM	504	628	418	237	Not Determined	Not determined

### What are outcomes in patients with uncomplicated gonorrhea treated with single dose IV ceftriaxone?

A single dose of IV ceftriaxone 1 g resulted in high efficacy (~98%) in extra-genital gonorrhea in men.<sup>4</sup>

**Key Takeaway:** If a patient has already received a dose of ceftriaxone 1 -2 g IV, then they do NOT need an additional IM dose for the treatment of uncomplicated gonorrhea.

### References:

1. Workowski KA, Bachmann LH, Chan PA, et al. Sexually Transmitted Infections Treatment Guidelines, 2021. CDC. 2021.
2. St. Cyr S, Barbee L, Workowski KA, et al. Update to CDC's Treatment Guidelines for Gonococcal Infection, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1911–1916. DOI: <http://dx.doi.org/10.15585/mmwr.mm6950a6>
3. Sandoz. Ceftriaxone Package Insert. 2013
4. Aoki T, Mizushima D, Takano M, et al. Efficacy of 1 g Ceftriaxone Monotherapy Compared to Dual Therapy With Azithromycin or Doxycycline for Treating Extragenital Gonorrhea Among Men Who Have Sex With Men. *Clin Infect Dis*. 2021;73(8):1452-1458. doi:10.1093/cid/ciab455