

# Infusion Protocol

## Cyclophosphamide (Cytoxan®)

### Indication:

Cyclophosphamide is an antineoplastic, alkylating agent used off label as a powerful immunosuppressant.

Not FDA approved for MS disease modification. Used off label.

### Dosing:

Patient:

Height: XX" or XX cm

Weight XXX lbs or XX KG

Calculate Body Surface Area (BSA) /meter squared

Dose: cyclophosphamide XXX mg/M<sup>2</sup>

### Pre-Dosing:

Labs: CBC; Chemistry; LFT; urinalysis; pregnancy test; serology Hepatitis B and C; Quantiferon gold TB test

Hydration at home to 3L

0.5 mg lorazepam

### Medication Orders:

Cyclophosphamide treatment timeline: q monthly for 12 months and then QoMo for 12 months.

### Cyclophosphamide Infusion:

1. Start IV 1000 mL NS to run over 1 hour prior to cyclophosphamide therapy; follow with second bag of 1000 mL during infusion and third bag of 1000 mL post infusion.
2. Before cyclophosphamide give 8 mg Ondansetron IV in 50 ml NaCl over 15 minutes.
3. IV cyclophosphamide 1384 mg in 250 mL NaCl over 1 to 3 hours.
4. Sodium 2-mercaptoethanesulfonate (Mesna) 600 mg IV in 50 ml NaCl over 15 minutes.

### Post-Cyclophosphamide Infusion:

1. 8 mg Ondansetron IV in 50 mL NaCl over 15 minutes.

**Discharge:**

1. Send patient home with PO doses of Ondansetron 8 mg with instructions to take every 12 hours for three days; May take every 8 hours for greater nausea.
2. Continue to drink 3 liters of fluid in the day after treatment.
3. 0.5 mg lorazepam q 6h for ongoing nausea and anxiety.
4. Void frequently; empty bladder every 90 minutes the day after infusion.
5. Report rusty colored or red urine.
6. CBC at 12-15 days post infusion.
7. Labs (CBC, Chem, LFT, UA) 7 days prior to next infusion.

**Common AE:**

Nausea, vomiting, alopecia, infertility, menstrual irregularities, risk of infection, bladder toxicity (mitigated with aggressive hydration), risk of malignancy (limit dosing), neutropenia

Delayed reaction (hypersensitivity): angioedema; difficulty breathing; throat swelling, tachycardia, chest pain, rash, nausea and vomiting that does not resolve

**References:**

- Awad A, Stuve O. Cyclophosphamide in multiple sclerosis: scientific rationale, history and novel treatment paradigms. Ther Adv Neurol Disord. 2009 Nov;2(6):50-61.