AMINOPHYLLINE:

Class: Phosphodiesterase Enzyme Inhibitor, Nonselective.

Indications:

Label-Treatment of symptoms and reversible airway obstruction due to asthma or other chronic lung diseases (e.g., emphysema, chronic bronchitis).

Unlabeled- Reversal of adenosine-, dipyridamole-, or regadenoson-induced adverse reactions (e.g., angina, hypotension) during nuclear cardiac stress testing.

Available dosage form in the hospital:

-AMINOPHYLLINE I.V 250MG/10ML AMP

-AMINOPHYLLINE 350MG TAB

Dosage:**Note:** Doses should be individualized based on peak serum concentrations and should be based on ideal body weight. Theophylline dose is 80% of aminophylline dose.

-Acute symptoms: Loading dose: Oral, I.V.:

-Patients **not currently receiving** aminophylline or theophylline: Aminophylline 5.7 mg/kg (equivalent to theophylline 4.6 mg/kg) administered I.V. or theophylline 5 mg/kg administered orally.

-Patients **currently receiving** aminophylline or theophylline: A loading dose is not recommended without first obtaining a serum theophylline concentration in patients who have received aminophylline or theophylline within the past 24 hours. The loading dose should be calculated as follows:

**Dose = (desired serum theophylline concentration - measured serum theophylline concentration) (Vd)

-Acute symptoms: Maintenance dose: I.V.:**Note**: To achieve a target theophylline concentration of 10 mcg/ml unless otherwise noted. Lower initial doses may be required in patients with reduced theophylline clearance. Dosage should be adjusted according to serum level measurements during the first 12- to 24-hour period.

- Adults 16-60 years (otherwise healthy, nonsmokers): 0.51 mg/kg/hour (equivalent to theophylline 0.4 mg/kg/hour); maximum: 900 mg/day unless serum levels indicate need for larger dose
- Adults >60 years: 0.38 mg/kg/hour (equivalent to theophylline 0.3 mg/kg/hour); maximum: 400 mg/day unless serum levels indicate need for larger dose
- Dosage adjustment for cardiac decompensation, cor pulmonale, hepatic dysfunction, sepsis with multiorgan failure, shock: 0.25 mg/kg/hour (equivalent to theophylline 0.2 mg/kg/hour); maximum: 400 mg/day unless serum levels indicate need for larger dose

-Dosage adjustment after serum theophylline measurement:

- *Within normal limits:* Asthma: 5-15 mcg/ml: Maintain dosage if tolerated. Recheck serum theophylline concentration at 24-hour intervals (for acute I.V. dosing) or at 6-

to 12-month intervals (for oral dosing). Finer adjustments in dosage may be needed for some patients. If levels ≥15 mcg/ml, consider 10% dose reduction to improve safety margin.

- Too high:
  - 20-24.9 mcg/ml: Decrease dose by ~25%. Recheck serum theophylline concentrations.
  - 25-30 mcg/ml: Skip next dose (oral) or stop infusion for 12 hours (children) or 24 hours (adults) and decrease subsequent doses by ~25%. Recheck serum theophylline concentrations.
  - >30 mcg/ml: Stop dosing and treat overdose; if resumed, decrease subsequent doses by 50%. Recheck serum theophylline concentrations.

- Too low: <9.9 mcg/ml: If tolerated, but symptoms remain, increase dose by ~25%. Recheck serum theophylline concentrations.

Note: Recheck serum theophylline levels after 3 days when using oral dosing, or after 12 hours (children) or 24 hours (adults) when dosing intravenously. Patients maintained with oral therapy may be reassessed at 6- to 12-month intervals.

-Chronic conditions: Oral: **Note**: Increase dose only if tolerated. Consider lowering dose or using a slower titration if caffeine-like adverse events occur. Smaller doses given more frequently may be used in patients with a more rapid metabolism to prevent breakthrough symptoms which could occur due to low trough concentration prior to the next dose.

-Adults 16-60 years **without** risk factors for impaired theophylline clearance:

- Aminophylline 380 mg/day (equivalent to theophylline 300 mg/day) in divided doses every 6-8 hours for 3 days;
- Then increase to 507 mg/day (equivalent to theophylline 400 mg/day) in divided doses every 6-8 hours for 3 days
- Maintenance dose: 760 mg/day (equivalent to theophylline 600 mg/day) in divided doses every 6-8 hours

Dose adjustment in patients **with** risk factors for impaired theophylline clearance and patients in whom monitoring serum theophylline levels is not feasible: Do not exceed a dose of aminophylline 507 mg/day (equivalent to theophylline 400 mg/day)

-Reversal of adenosine-, dipyridamole-, or regadenoson-induced adverse reactions (e.g., angina, hypotension) during nuclear cardiac stress testing (unlabeled use): I.V.: 50-250 mg administered over 30-60 seconds, repeat as necessary. **Note**: Since adenosine-induced side effects are short lived after discontinuation of the infusion, aminophylline administration is only very rarely required.

Geriatric
Adults >60 years: Refer to adult dosing. Do not exceed a dose of aminophylline 507 mg/day (equivalent to theophylline 400 mg/day)

Renal Impairment:
Oral, I.V.: No dosage adjustment necessary.

Hepatic Impairment:
No dosage adjustment provided in manufacturer's labeling for hepatic impairment ; however, theophylline clearance is decreased ≥50% in patients with hepatic impairment (e.g., cirrhosis, acute hepatitis, cholestasis); a dose reduction may be required.

Common side effect:

Frequency not defined. Adverse events observed at therapeutic serum levels:

- Cardiovascular: Flutter, tachycardia
- Central nervous system: Behavior alterations (children), headache, insomnia, irritability, restlessness, seizures
- Dermatologic: Allergic skin reactions, exfoliative dermatitis
- Gastrointestinal: Diarrhea, nausea, vomiting
- Neuromuscular & skeletal: Tremor
- Renal: Diuresis (transient)

Pregnancy Risk Factor: C