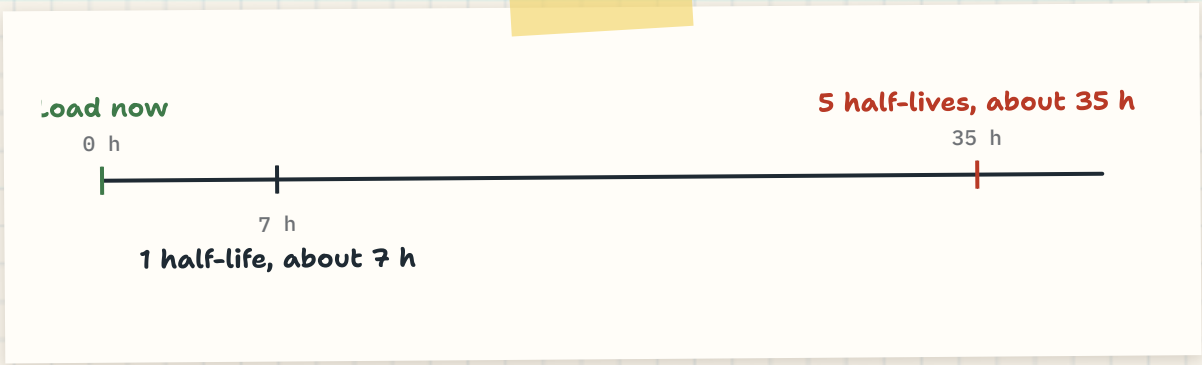
Loading and maintenance doses

Vd fills the container, CL drains it, F corrects the route



Step by step

1. Load = Css × Vd / F
2. Rate = Css × CL / F
3. Interval dose = rate × interval
4. Organ failure: cut the rate; load changes only if Vd or F changes

Route	Loading dose	Maintenance rate
IV (F = 1)	10 × 40 = 400 mg	10 × 4 = 40 mg/h
Oral (F = 0.5)	400 / 0.5 = 800 mg	40 / 0.5 = 80 mg/h
Every 12 h (IV)		40 × 12 = 480 mg

Example: Css 10 mg/L, Vd 40 L, CL 4 L/h

DOSES

$$\text{Load} = \text{Css} \times \text{Vd} / \text{F};$$
$$\text{Rate} = \text{Css} \times \text{CL} / \text{F}$$

F = 1 for IV; divide both by F for other routes

Rule of thumb

Vd fills the container: loading dose
CL drains it: maintenance dose
Steady dose alone: about 5 half-lives

Exam traps

- Divide by F; do not multiply.
- Clearance is not part of the loading dose.
- Organ failure lowers the maintenance dose; the loading dose usually stays the same.

Loading dose and maintenance dose, explained

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/pharmacology-principles-autonomic/loading-and-maintenance-doses

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