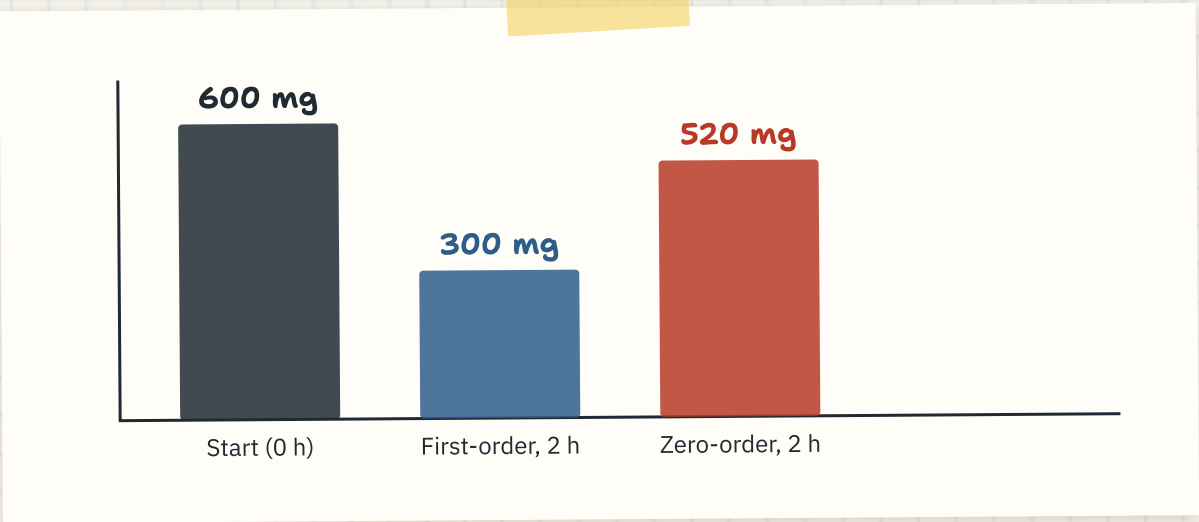
Zero-order vs first-order elimination

Constant fraction or constant amount?



Step by step

1. Low concentration: first-order
2. Enzymes fill up: rate levels off at Vmax
3. High concentration: zero-order
4. Small dose rise, large level rise

	First-order	Zero-order
Removed per time	Constant fraction	Constant amount
Half-life	Fixed	None fixed
Enzymes	Below capacity	Saturated
600 mg example	300, 150, 75 (2, 4, 6 h)	560, 520, 480 (1, 2, 3 h)

Two kinds of elimination

Rule of thumb

Fraction = first-order; amount = zero-order

Saturation turns first into zero

Phenytoin, ethanol, aspirin (toxic dose)

Exam traps

- Saturated enzymes are not first-order.
- Zero-order has no fixed half-life.
- Near saturation, a small dose rise gives a big level rise.

Zero-order vs first-order elimination explained

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/pharmacology-principles-autonomic/zero-order-vs-first-order-elimination

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