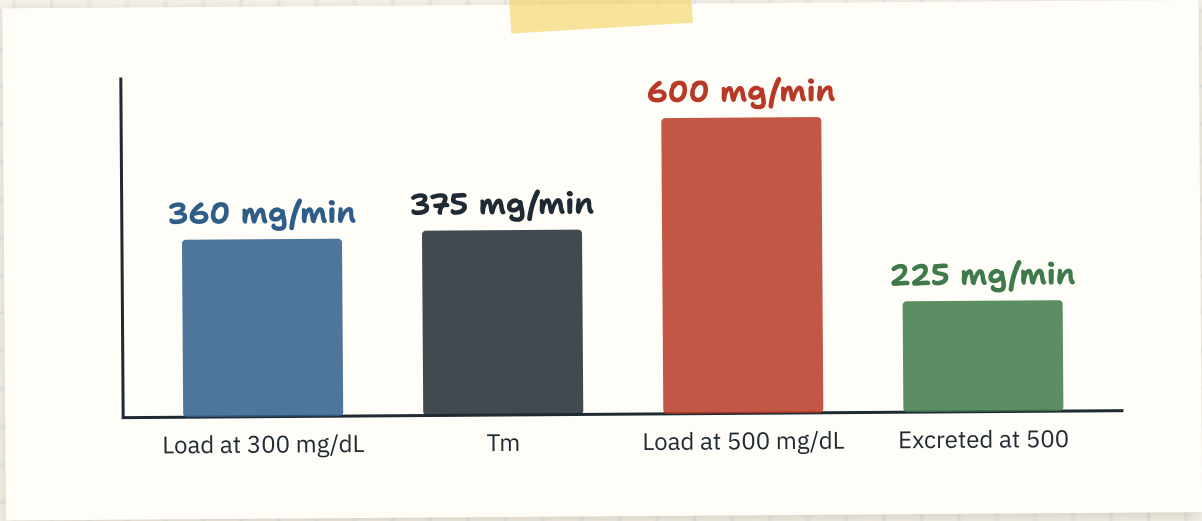
Glucose Tm and splay in one page

Filtered load, transport maximum, threshold, SGLT2



Step by step

1. Filtered load = GFR × plasma glucose
2. Load ≤ Tm: no glucose in urine (simple model)
3. Load > Tm: excretion = load − Tm
4. Splay: glucosuria starts below Tm ÷ GFR
5. SGLT2 inhibitor: Tm and threshold fall

EXCRETION ABOVE THE TM

$$\text{Excretion} = (\text{GFR} \times \text{plasma glucose}) - \text{Tm}$$

GFR in dL/min with glucose in mg/dL; Tm about 375 mg/min

Item	Value	Note
SGLT2	About 90%	Early proximal tubule (S1–S2); high capacity, low affinity
SGLT1	About 10%	Late proximal tubule (S3); low capacity, high affinity
Tm	About 375 mg/min	Carriers saturate; usually quoted value
Theoretical threshold	300 mg/dL	Tm ÷ GFR = 375 ÷ 1.25
Real threshold	About 180–200 mg/dL	Lower than theory: splay
With SGLT2 inhibitor	Under 100 mg/dL	Tm falls; no insulin needed

Key glucose-handling values

Rule of thumb

Glucosuria = load above capacity

High plasma glucose, or lowered capacity

Exam traps

- Excretion is load minus Tm, not load plus Tm and not the Tm itself.
- Splay means glucosuria begins below the theoretical threshold.
- Convert GFR to dL/min when glucose is in mg/dL.
- SGLT2 inhibitors cause glucosuria at a normal plasma glucose.

Glucose transport maximum, splay and SGLT2

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/renal-physiology/glucose-transport-maximum-splay-sglt2

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