**[Dr Sharon Rees](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)**[@reesprescribe](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

Day 1: 7 days of [#furosemide](https://twitter.com/search?q=%23furosemide). Discovered in the late 1950’s, the loop diuretic [#furosemide](https://twitter.com/search?q=%23furosemide)’s chemical origins are traced back to sulfonamide derivatives. Despite not retaining the allergenic aromatic amine group, the product info still advises against taking if history of sulfa-allergy.

[](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

**[Dr Sharon Rees](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)**[@reesprescribe](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

Day 2: [#furosemide](https://twitter.com/search?q=%23furosemide) remains in widespread use, mainly to manage oedema (pulmonary, heart failure & resistant oedema). Oral dose 40-120mg/day (spans all indications), i.m/i.v titrated from 20-50mg initially to max 1.5g/day. i.v diuresis starts within 10 mins, oral within 1 hr, with a duration approx 4-6 hrs. To preserve potassium (K+), can be combined with other diuretics (amiloride, triamterene, spironolactone) or K+

[](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

**[Dr Sharon Rees](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)**[@reesprescribe](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

Day 3: MOA; the Na-K-2Cl major transport proteins mediate salt absorption throughout nephron, especially in the loop of Henle. Competition from [#furosemide](https://twitter.com/search?q=%23furosemide) inhibits reabsorption, causing ↑ water excretion (+ many electrolytes). Also vaso-dilatory action, enhancing treatment of acute pulmonary oedema

[](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

**[Dr Sharon Rees](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)**[@reesprescribe](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

Day 4:Kinetics; oral bioavailability variable (severe oedema will also reduce GI absorption), low Vd & taken to tubules as highly protein bound. Hepatic metabolism produces 1 active metabolite, t ½ 2-4hrs (↑in severe renal failure). Half cleared renally (unchanged) & rest metabolised in kidney

[](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

**[Dr Sharon Rees](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)**[@reesprescribe](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

Day 5: Common ADRs [#furosemide](https://twitter.com/search?q=%23furosemide) include dizziness, headaches, electrolyte disturbances, dehydration, nephrocalcinosis (infants); Rare; blood disorders, tinnitus, gout, vasculitis (not exhaustive).Overdose delirium, cardiac toxicity, excessive diuresis/shock, acute renal failure

[](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

**[Dr Sharon Rees](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)**[@reesprescribe](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

(cont): [#furosemide](https://twitter.com/search?q=%23furosemide) can cause dose-dependent hearing loss; unlikely to be permanent if no risk factors such as an ↑ drug concentration re hepatic failure. Cochlear hair cells need correct K+/Na+ balance. Competition for the Na+/K+ transporter may disrupt function or effect cochlear blood flow.

[](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

**[Dr Sharon Rees](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)**[@reesprescribe](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

Day 6: [#furosemide](https://twitter.com/search?q=%23furosemide) drug-drug interactions; all anti-hypertensives, anti-psychotics (cardio toxicity), associated with K+ loss, ↑risk digoxin toxicity, any drug causing hypokalaemia or QT prolongation, ↓lithium excretion, risk nephron toxicity with NSAIDs, ↑ototox aminoglycosides + vanc (not exhaustive)

[](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

**[Dr Sharon Rees](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)**[@reesprescribe](https://twitter.com/reesprescribe%22%20%5Ct%20%22_blank)

Day 6 (cont): Drug-food interaction [#furosemide](https://twitter.com/search?q=%23furosemide). Excessive liquorice intake increases risk hypokalaemia! A lot needs to be taken, but the active ingredient causes ↑ mineralocorticoid levels, so there is more potassium excretion



[**Dr Sharon Rees**](https://twitter.com/reesprescribe)

[@reesprescribe](https://twitter.com/reesprescribe)

Day 7: Long-term [#furosemide](https://twitter.com/search?q=%23furosemide) can lead to resistance. Possible mechanisms are progressively reduced renal function, altered kinetics so less drug delivery to tubules & adaptive increased salt re-absorption downstream. Dietary salt restriction is important if there is resistance.

CPD: in addition to the tweets, read the BNF section on Oedema and the monographs on loop diuretics and furosemide. Another useful source is the Summary of Product Characteristics for furosemide

<https://www.medicines.org.uk/emc/product/5861/smpc>

There are 10 CPD questions below. Most but not all answers will be in the tweets. There is only one correct answer per question

1. Furosemide is a first-line drug for hypertension

TRUE or FALSE

1. Which is TRUE?
2. Oral furosemide starts to work in 5 minutes
3. Furosemide only works in the kidney
4. Furosemide is helpful to manage heart failure related oedema
5. Everyone on furosemide needs monitoring of plasma drug levels
6. Hyperkalaemia is the main electrolyte issue with using furosemide

TRUE or FALSE

1. Furosemide has a severe drug interaction with
2. Foods high in potassium
3. Risperidone
4. Salbutamol
5. Phenytoin
6. The drug target for furosemide is
7. A membrane transport protein in the thick ascending loop of Henle which moves Na, K and Cl ions across the cell membrane
8. A calcium ion channel in the distal convoluted tubule
9. An antiport exchanging sodium ions and water for chloride found in the descending loop of Henle
10. Water-filled pores along the nephron length
11. Which is TRUE?
12. Furosemide cannot be combined with other diuretics
13. Furosemide has an active metabolite
14. Furosemide is extensively metabolised in the liver
15. The half-life of furosemide is several days
16. Ototoxicity is likely to result in permanent deafness

TRUE or FALSE

1. If there is diuretic resistance, it is important to follow a low sodium diet

TRUE or FALSE

1. A lower dose of furosemide should be considered in the elderly because they are susceptible to side effects

TRUE or FALSE

1. Which of the following is NOT a common side effect for furosemide?
2. Increased blood creatinine levels
3. Muscle spasm
4. Headache
5. Gout