Guidance for the prescribing and monitoring of phenytoin (IV and oral) in Adults

- For **STATUS EPILEPTICUS** management see guideline: https://nhslguidelines.scot.nhs.uk/media/2340/management-of-generalised-convulsive-status-epilepticus-in-adults.pdf

- For **UNCONTROLLED EPILEPSY:**

❖ If **NEW phenytoin**:

1. Load with phenytoin as per Status Epilepticus guideline[1] (see above)
2. If to continue therapy, commence **maintenance dose** of phenytoin (**3-5mg/kg/day**[2]) starting **12-24** hours after loading dose (if given)
3. Ensure appropriate monitoring (tables 1 and 2)

❖ **ON phenytoin** prior to admission:

1. Check phenytoin and albumin levels
2. If **albumin** level is **LOW** correct the phenytoin level using the equation[1] below:

$$\text{Corrected phenytoin concentration} = \frac{\text{measured phenytoin concentration}}{(0.9\text{x Albumin (g/L)} / 42^{*}) + 0.1}$$

*Mid-point of albumin range

(Phenytoin is highly protein-bound but only the unbound concentration is active. If serum albumin concentration is low, a higher proportion of the total (measured) phenytoin concentration is unbound and caution is therefore required when interpreting the result- the equation gives a rough estimate and the patient's clinical condition should be the most important consideration. Seek advice from neurology or pharmacy if needed)

3. If **phenytoin** level (or corrected phenytoin level) is **LOW**:
- Give a top-up dose of phenytoin to achieve a therapeutic level (table 3)
- Ensure appropriate monitoring (tables 1 and 2)
- Consider increasing the maintenance dose of phenytoin- usually small increments only (25-50mg) with monitoring (tables 1 and 2), discuss with neurology if required

4. If **phenytoin** level (or corrected phenytoin level) is **NORMAL**:
- Consider increasing the maintenance dose of phenytoin- usually in small increments only (25-50mg) with monitoring (tables 1 and 2) **OR**
- Discuss with neurology re addition of other anti-epileptic agents

Table 1- When to check phenytoin levels[2]

Target concentration- **5-20mg/l-** remember to always check albumin level and correct if low
After loading or top-up doses- 2-4 hours post IV dose or 12-24 hours after oral dose
Commencing maintenance dose or maintenance dose change- 3 -5 days after starting maintenance dose then re-analyse after a further 5-10 days (further accumulation can occur)
Routine monitoring- trough concentration (i.e. sample prior to next dose)
Suspected phenytoin toxicity- check level daily until < 20mg/l and/ or clinical signs resolved (table 4)

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Table 2- Phenytoin safety and monitoring requirements

- Check drug is prescribed correctly on HEPMA
- Check drug dose is appropriate
- Check drug is being administered and route is appropriate (table 5)
- Check LFT's and renal function
- Always check albumin level when checking phenytoin levels
- If new therapy- monitor for serious side effects e.g. leucopenia, skin reactions (BNF[3])
- Consider drug interactions (BNF[3])
- Maintain patient on the same **BRAND** of phenytoin

Table 3- TOP-UP dose equation[2]

Phenytoin sodium Top-up dose (mg) = (20 – measured concentration (mg/l)) x 0.7 x weight (kg)

	Approximate concentration increase			
Weight / Dose	**50kg**	**60kg**	**70kg**	**80kg**
250mg	7mg/l	6mg/l	5mg/l	4.5mg/l
500mg	14mg/l	12mg/l	10mg/l	9mg/l
750mg	21mg/l	18mg/l	15mg/l	13.5mg/l

(Approximate increase in phenytoin concentration with 'top-up' doses)

Example- if the patient weighs 70 kg and has a measured concentration of 5 mg/L, a single dose of 750 mg will increase the concentration to around 20 mg/L (5 mg/L + 15 mg/L).

Table 4- Common signs of Phenytoin Toxicity[3,4]

Drowsiness	Confusion	Slurred speech
Ataxia	Nausea	Nystagmus
Mental changes	Hyperglycaemia	Coma

Table 5- Conversion between formulations[2, 5]

Phenytoin sodium **100 mg capsules / tablets/ injection** = phenytoin **90mg suspension**

(Patients with **enteral feeding tubes**- administer phenytoin by parenteral injection if possible as enteral absorption is extremely unpredictable- contact pharmacy for further advice if required)

References

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