URINE ALKALINISATION FOR ENHANCED ELIMINATION OF SALICYLATES

- Urine alkalisation enhances renal elimination of a select number of toxins by the administration of intravenous sodium bicarbonate (NaHCO₃) to produce urine with a pH ≥ 7.5.
- For certain toxins that are weak acids, urine alkalisation increases the ionization of the toxin in the renal tubular lumen to decrease diffusion back into blood, thereby increasing renal clearance.

**Indications:**

**Acute ASA overdose:**
- If ASA level not available & patient has signs more than tinnitus
- [ASA] ≥ 3.5 mmol/L (48 mg/dL)
- Metabolic acidosis

**Chronic ASA toxicity:**
- Consider alkalisation for [ASA] ≥ 2.9 mmol/L (40 mg/dL) since symptoms/signs do not correlate with levels in chronic toxicity

**End Point:**
- [ASA] ≤ 2.2 mmol/L (30 mg/dL) AND
- 2 consecutive [ASA] levels coming down AND
- Patient is clinically well

**Contraindications:**
- ARDS/pulmonary edema, cerebral edema, or renal failure

**Urine alkalisation preparation and dosing:**

1. Use 8.4% (1 mmol NaHCO₃/ml) 50 mL ampules when available. Remove 150 mL from 1 Litre of D5W. Add 150 mL of NaHCO₃ (8.4%)(ie. 3 X 50 mL ampules) to that litre bag. The total volume will again be 1 litre. If serum K+ needs correction, may add 20-40 mEq of KCl to this same bag. Run this solution at 1 ½ to 2 times maintenance (2-3 mL/kg/h to a maximum of 200 mL/hr) to ensure a urine output of 2-3 mL/kg/hr.
- If only 7.5% (0.89 mmol NaHCO₃/ml) 50 mL ampules are available, may use as a substitute for the 8.4% NaHCO₃ ampules. Note that the final solution will be slightly hyponatremic.

2. A foley catheter must be inserted. The original bladder contents must be emptied. Every 1-2 hours the contents of the catheter bag must be emptied and the pH tested. Aim for urine pH ≥ 7.5.

**Monitoring:**

- Urine pH every 1-2 hours
  - Target urine pH >7.5
- Serum blood gases every 2 hours
  - Keep serum pH < 7.56
- Serum potassium (K⁺) every 2 hours
  - K⁺ may require IV or oral liquid supplementation to ensure effective urine alkalisation (extended-release oral K⁺ supplements are not appropriate for this indication)
  - Target normal range 3.5-5 mmol/L
- Serum salicylate levels every 2 hours
  - Continue to monitor levels until at least 2 decreasing levels AND final level < 2.2 mmol/L (30 mg/dL)

**Contact Poison Centre:**

- Any deterioration in patient condition
- Evidence of decreased O₂ saturations, pulmonary edema, altered mental status, renal failure, oliguria, serum pH >7.55, non-resolving metabolic acidosis, rising serum ASA levels or serum ASA levels not declining despite urine alkalisation
- Any questions or concerns