

Normal Values

- pH 7.35-7.45
- PaC02 4.5-6 kPa (35-50 mm Hg)
- Pa02 11-14 kPa (83-105 mm Hg)
- Standard bicarbonate 22-28 mmol/l
- Anion gap 10-16 mmol/l
- Chloride 98-107 mmol/l
- BE -2 to +2

respiratory

Respiratory Acidosis

Respiratory alkalosis

Hypercapnia due to ventilatory failure pH change due to hyperventilation and CO2 loss

metabolic

Metabolic acidosis

Metabolic alkalosis

Lots of causes
Need to know anion gap to help work out cause

commonest cause dehydration due to diuretics

Whats the anion gap?

Difference between + and - ions

Na and K

Cl and HCO

Helps to find cause of the metabolic acidosis

Too much acid (†anion gap) or increase loss of HCO (normal anion gap)

Anion gap
(Na + K) – (Cl + HCO)
normal range 10-16mmol

MUDPILES

Raised anion gap (too much acid)

Methanol
Uraemia

DKA

Paraldehyde

Iron/Isoniazid

Lactic acidosis (shock/ sepsis)

Ethanol, ethylene glycol

Salicylates

Normal anion gap (too much bicarb loss)

Diarrhoea
Fistula
Renal Tubular acidosis
Carbonic anhydrase
inhibitors
(acetazolamide)

30 year old male in status epilepticus

pH 7.05

pO₂ 15

pCO₂ 8

HCO 16

BE -9

Mixed acidosis

- Respiratory acidosis due to hypoventilation due to diazepam and status
- Metabolic acidosis due to lactic acid build up during fit.

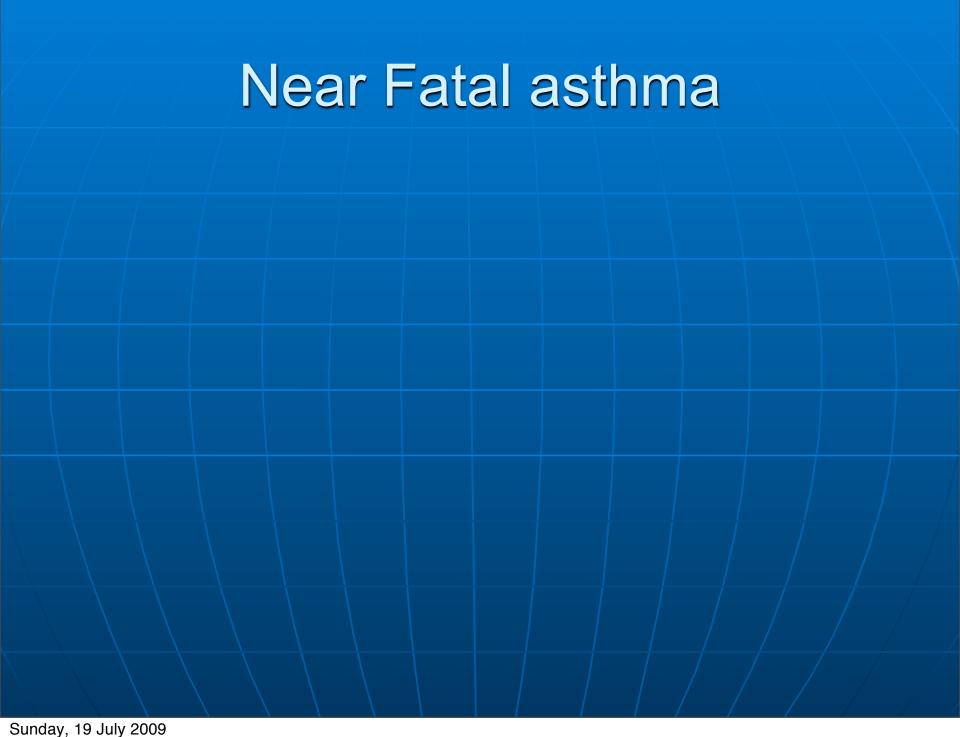
16 year old asthmatic

- pH 7.35
- p0₂ 15 KPa
- pC0₂ 4.5 KPa
- HCO 23 mmol/L
- BE +2

Normal CO₂

 Expect a hyperventilating patient to have a low CO₂. The "normal" CO₂ puts the patient into the severe acute asthma group.

(NB A raised puts the patient into near fatal asthma group)



■ pH 7.35

- pH 7.35
- pO2 15

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- pCO2 6.1

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- pO2 15
- pCO2 6.1
- HCO 22

- pH 7.35
- **p**02 15
- pCO2 6.1
- HCO 22
- BE +2

30 year old male with 5 day Hx of SOB.

CXR shows pneumothorax.
ABGs:

pH 7.46 P02 15L pC02 3.0 HCO 16 BE 3 Resp alkalosis with renal compensation.

 5 day Hx means time for renal compensation (hence HCO being low)

summary

- Anion gap helps find cause of metabolic acidosis
- (Na + K) (Cl + HCO)
- MUDPILES increased anion gap
- Normal CO2 in asthma is abnormal