

You are the consultant emergency physician in an urban district hospital.

An 18 yo female is brought to your ED by her concerned family reporting weight loss. They have become more concerned today as the patient has become more lethargic.

The patient engages only superficially with assessment.

The following vbg is performed:

pH 7.54

pCO<sub>2</sub> 92

pO<sub>2</sub> 28

HCO<sub>3</sub> 70

Hb 154

Na 132

K 2.9

Ca 1.05

Cl ??

Glu 4.2

Lac 4.5

Please describe 4 significant abnormalities present in the above VBG including calculations where relevant. (4 marks)

- Severe metabolic alkalosis – pH 7.54, HCO<sub>3</sub> 70
- Expected pCO<sub>2</sub> –  $0.7 \times 70 + 21 = 70$  ie concomitant respiratory acidosis
- Undetectable Cl – likely GI loss due to vomiting
- Lactate 4.5 – element of cellular hypoperfusion – Hb likely spuriously elevated (probably low at baseline)
- Mild hypoK<sup>+</sup> - corrected for pH 7.54 (ie  $1.4 \times 0.3 - 0.5$ ) K = 3.3-3.6

Lots adjusted the K<sup>+</sup> for pH, but from the upper limit of the normal range. We're down the other end. I had LOTS of candidates stating the lower limit for a K<sup>+</sup> they would accept was 4.2! The normal limit for a pH of 7.40 is below this.

Need to identify the respiratory acidosis

Need to identify the hypoCl

Issues:

Putting down 5 answers!!!

Severe hypokalaemia – no

Ignoring the Cl

List your differential diagnosis for this patient (4 marks)

hypokalaemic, hypochloraemic, metabolic alkalosis - this should make you think of multiple causes of excessive vomiting beyond AN

Differential:

- functional vomiting eg anorexia/bulimia,
- gastric outlet obstruction,
- gastroparesis,
- cannabis hyperemesis,
- hyperemesis gravidarum
- diuretic abuse
- Bartter's/Gittelmans

The patient is now stating she wishes to leave. The parents state she shouldn't be allowed to leave.

Describe the essential elements required to demonstrate competence. (4 marks)

The list from Cameron:

- the ability to maintain and communicate a choice
- the ability to understand the relevant information
- the ability to remember information relevant to the decision
- the ability to appreciate the situation and its consequences
- the ability to use or weigh the information in a rational fashion

You have to know this list not just so you can pass the exam, but also so you can work in an ED on a Friday or Saturday night.

Please note that illness, intoxication or mental illness do not automatically preclude competence - if the patient can satisfy the above criteria then they are competent.