VAQ 2009.1.3 (Bloods)

An 86 year old woman is brought to your emergency department from her nursing home with two days of drowsiness and decreased oral intake.

			Reference Range
Haemoglobin	129	gm/L	115-160
WCC	15.3	x 10^9/L	4-11
Platelets	221	x 10^9/L	150-400
Neutrophils	11.5	x 10^9/L	2.0 –7.5
Na^+	138	mmol/L	134-146
K^+	5.4	mmol/L	3.4-5
Cl^-	94	mmol/L	98-106
$HCO3^-$	24	mmol/L	22-32
Urea	25.8	mmol/L	3-8
Creatinine	352	mmol/L	45-90
Glucose	7.4	mmol/L	3.5-5.5
Total Protein	72	g/L	60-80
Albumin	15	g/L	35-50
Globulins	57	g/L	23-35
Total bilirubin	146	µmol/L	< 20
ALT	38	U/L	< 35
ALP	2590	U/L	35-135
GGT	1020	U/L	< 40

Describe and interpret her investigations (100%)

These bloods demonstrate a neutrophil leucocytosis, marked renal impairment, an obstructive pattern of LFTs, and marked hypoalbuminaemia. This combination is concerning for severe sepsis, with likely underlying causes of intrahepatic or extraheptic biliary obstruction such as cholecystitis or cholangitis secondary to bile duct stone or extrinsic compression e.g. pancreatic head carcinoma. Goal directed therapy, broad spectrum antibiotics and surgical review with imaging (abdominal USS +/- CT) would be the usual treatment, mitigated by any treatment ceiling as appropriate.

Important bits in **bold**

moderate **leucocytosis / neutrophilia**
- any inflammatory or infectious cause
- in this setting most likely **sepsis / SIRS response**
- hepatobiliary source in context of clinical findings and LFT results

mild hyperkalaemia
- increased intake
- possible contribution if on supplementation
- reduced excretion
- renal impairment noted – most likely cause
- transcellular shift
  - normal bicarbonate so unlikely significant contribution

normal sodium, glucose – excludes these as cause for drowsiness

markedly raised urea, creatinine - acute kidney injury
- ratio suggests but not diagnostic of element of chronic impairment
- prerenal causes
  - hypovolaemia
    - likely due to reduced oral intake
  - may be on diuretics
  - likely infectious process leading to intravascular depletion
- renal causes
  - elderly patient, U:Cr ratio suggest contribution
- postrenal causes
  - obstruction
    - not suggested in this scenario

hypoalbuminaemia
- reduced production
  - liver failure/critical illness/malnutrition
    - at risk of all in although normal ALT suggests against liver failure
- increased loss
  - check for proteinuria but not likely in this scenario

raised globulins
- myeloma / haematological malignancy
  - unlikely to be acute concern
  - check medical history
  - may contribute acutely to renal impairment

marked elevation bilirubin / ALP / GGT with normal ALT
- **'obstructive pattern' (give at least 2 possible causes)**
  - intrahepatic biliary obstruction
    - hepatic mass
    - hepatocellular carcinoma
    - hepatic metastasis
    - bile duct stone / cholecystitis
  - extrahepatic
    - pancreatic head mass
    - cholangiocarcinoma
    - cholangitis

Overall picture is of **severe biliary tract sepsis with biliary obstruction**.