

## 2. Creatine Kinase

<b>Ward</b>	Pollsmoor Female Centre	<b>D.O.B/Age</b>	10/10/1988
<b>Consultant</b>			

Creatine kinase (CK)	265 070 H	U/L	20 – 180
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Differential diagnosis in this patient includes  
rhabdomyolysis, severe burns, myocardial injury or ischaemia.

# History

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Sodium	139
mmol/L	136 – 145

Potassium	3.8
mmol/L	3.5 – 5.1

Urea	2.6
mmol/L	2.1 – 7.1

Creatinine	63
umol/L	49 – 90
eGFR (MDRD formula)	>60
mL/min/1.73 m2	

Total protein	76
g/L	60 – 78

Albumin	46
g/L	35 – 52

Total bilirubin	6
umol/L	5 – 21

Conjugated bilirubin (DBil)	2
umol/L	0 – 3
Alanine transaminase (ALT)	<b>317 H</b>
U/L	7 – 35
Aspartate transaminase (AST)	<b>1727 H</b>
U/L	13 – 35
Alkaline phosphatase (ALP)	<b>153 H</b>
U/L	42 – 98
Gamma-glutamyl transferase (GGT)	<b>43 H</b>
U/L	<40

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## Final diagnosis

Rhabdomyolysis (most likely secondary to blunt force trauma).

Creatine kinase is an enzyme primarily found in muscle tissue that catalyzes the conversion of creatine and adenosine triphosphate (ATP) into phosphocreatine and adenosine diphosphate (ADP). This reaction is reversible and thus phosphocreatine serves as a rapidly available source of ATP. When muscle tissue is stressed or inflamed, the sarcoplasmic membrane becomes permeable and leaks cytosolic enzymes like creatine kinase into the bloodstream. The differential diagnosis of an elevated CK concentration is long and complex. Musculoskeletal trauma, myocardial injury, infections, and drug-induced myositis are the most common causes encountered in general clinical practice. Also worth noting in this patient is the AST is markedly elevated in comparison to the other liver enzymes. This, coupled with the elevated CK levels imply that quite significant muscle damage has occurred.

Making dilutions when results are appearing as having a greater than value on the analyzer is important. Creatine

kinase is an enzyme that may be used to monitor the clinical condition of a patient. It may thus be useful to know exact values to be able to determine ongoing damage vs resolution. By preparing samples in dilution, this allows for a relatively accurate determination of the concentration of an analyte of interest by overcoming large reagent requirements.