# Question 3 (14 marks).

A 30 year old man presents to your ED with an altered mental state and severe leg pain and swelling. You suspect rhabdomyolysis.

1. Give four (4) categories of cause of rhabdomyolysis, with an example from each category (8 marks):

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| --- | --- |
| **Category of cause****(4 marks)** | **Example****(4 marks)** |
| Prolonged immobilisation | Any appropriate e.g. drug OD, stroke, etc |
| Excessive muscle activity | Any appropriate e.g. marathon, exercise in non-prepared pt, prolonged seizure, neuroleptic malignant syndrome (NMS) |
| Muscle ischaemia | Crush, trauma, vascular injury, post revascularisation, other appropriate |
| Temperature extremes | Heat stroke, hypothermia, NMS, frostbite,  |
| Electrical injury | DC cardioversion, live wire injury |
| Electrolyte abnormality | Hypokalaemia, hypophosphataemia, hyponatraemia, hypernatraemia |
| Illicit drugs (in addition to immobility) | Opioid, antipsychotics, benzos, amphetamine, ecstasy, LSD, synthetic cannabinoids, NMS |
| Medications | Statins, fibrates, antipsychotics, NMS |
| Infection | Legionella but others (viral, parasite, bacterial) by hypoxia, myocyte invasion, altered cell metabolism |
| Inborn errors of metabolism | Enzyme deficiencies in carbohydrate, lipid metabolism. Myopathies |
| Other medical (need to give appropriate category to score e.g. autoimmune/thyroid disease) | CT/autoimmune disease inc SLE, hypothyroid, thyroid storm |
| Toxins | Snakebite, bees |

1. List the two (2) MOST life threatening potential complications of rhabdomyolysis. (2 marks)

i. **Hyperkalaemia (Must state this to gain full marks)**

ii. Renal failure

iii. Compartment syndrome

iv. DIC

v. Metabolic acidosis

vi. Liver failure

vii. Shock- third spacing

viii. Hypocalcaemia

1. Give the two MOST IMPORTANT specific ED treatments of rhabdomyolysis and their clinical aims/end points (4 marks)
* **Aggressive fluid resuscitation**. **Aim UO ≥300ml/hour. (Must state this one to score full marks).**
* Urinary alkalinisation with Na bicarbonate. Aim urine pH >6.5, serum pH 7.45
* Hyperkalaemia treatment. Aim K below 6 and resolved ECG changes
* Renal replacement therapy. Aim normalization of electrolytes, acidosis and renal function. Correction of fluid overload. NB this is more an ICU treatment rather than ED

NB Diuretics have not been shown to be beneficial. Mannitol will be accepted only if end point is normalising compartment pressures- its only indication.

Common Issues

Part a)

Cause and example didn’t match. Even if both were correct only the cause would score if the example was not from the cause’s category.

Don’t use same category twice e.g. trauma, then crush

Be specific. E.g. avoid “electrolyte abnormalities”, use specific electrolyte abnormalities. In this case hyperkalaemia. OR e.g. “exercise” normal exercise doesn’t cause rhabdo, need to say “excessive exertion” or similar and then give appropriate example e.g. marathon on hot day. “Other” is not a scoring category

Avoid just burns as example (rather than cause) e.g. state “full thickness electrical burns”. Unless the muscle is burnt or there is a vascular issue e.g. compartment syndrome then won’t get rhabdo

Part b)

AKI is not a life threat. A minor bump in creatinine is AKI and would really be no issue. I accepted renal failure.

Part c)

Not aggressive enough with fluids and UO aim. Most people did not state that they would give “aggressive” fluids, just said fluids. In this situation UO more than 1-2ml/kg/hr is needed e.g. >200-300 ml/hr or >3-4ml/kg/hr

Be careful with excessive aims. E.g. aiming for K of 3.5 is not optimal. A better answer would be aim K<6 and resolution of ECG changes.

Missing the clinical endpoint despite it being asked in the question.

General

Only write one answer per line or subpoint. Only first X asked for will be looked at.

Writing was generally readable.