1. **Scope**

1.1 This clinical guidance outlines the management and treatment of crush injury and rhabdomyolysis syndrome.

2. **Background and Definitions**

2.1 Crush syndrome should be anticipated and may develop when a patient is entrapped and crushed with extensive muscle or tissue involvement.\(^1\)

2.2 Entrapment should broadly be interpreted to mean that movement and circulation have been compromised and some form of extrication is necessary.

2.3 Patients trapped under debris/weight can appear haemodynamically stable until the object under which they are trapped is removed. The sudden release of a crushed limb may lead to a sudden rush of the liberated components of injured skeletal muscle into the wider circulation; acute renal failure can quickly ensue and the patient may rapidly become haemodynamically unstable.\(^2\)
3. **Guidance**

3.1 **Initial Care**

3.1.1 The following should initially be applied:

- Ensure safety of self, team and casualty;
- Assess patient using a CABCD approach and treat any immediate life-threatening injuries;
- Administer oxygen through a non-rebreather mask;
- Monitor vital signs every 5 minutes;
- Monitor SpO\(_2\) and ECG (lead II);
- Assess limb/s for 5 Ps – Pain, paraesthesia, paralysis, pallor and pulselessness to estimate extent of ischaemic injury;
- Preserve body heat;
- Consider the use of Entonox to manage pain. Use of IV/IO analgesia should be cautious, with consideration of hypotension.

3.1.2 Prior to release of crushing force, ascertain length of time entrapped:

- If 30 minutes or less - Consider arterial tourniquet/s;
- If over 30 minutes - Utilise arterial tourniquet/s.

3.2 **Pre-extrication**

3.2.1 Prior to release of the crushing force:

- Establish wide bore intravenous or intraosseous access in unaffected limb/s;
- Administer saline 0.9% at a rate of 1,500 mls/hour for adults (equivalent to one 500ml bag of fluid every 20 minutes), prior to release of compression force. For paediatrics pre-load at 20ml/kg over 1 hour). Caution should be exercised in patients with a history of cardiac failure, in order to avoid fluid overload;
- Immediately prior to release apply and tighten arterial tourniquet/s to affected limb/s.

3.3 **Extrication**

3.3.1 Extricate patient in conjunction with the Fire and Rescue Service.
3.4  Post Extrication

3.4.1  Following the extrication:

▲ Be prepared to resuscitate as clinical symptoms and signs dictate. Volume replacement is the mainstay treatment for patients with crush injuries and rhabdomyolysis, because it addresses the two main early threats to survival; hypovolaemic shock and hyperkalaemia;

▲ Arterial tourniquet/s must remain in situ until the patient arrives at hospital. Removal must only occur following a decision by the Emergency Department Doctor once a clinical handover of care has occurred;

▲ Suspect hyperkalaemia if T waves become peaked and/or the QRS prolonged. Doctors are authorised to administer calcium chloride 10% 10ml as a slow IV push.

4.  Documentation

In line with Trust Policy, a Patient Clinical Record must be completed and annotated appropriately. A Trauma Checklist form must also be completed for all patients where major trauma is suspected. Any deviation from this guideline must be recorded, with any potential or actual adverse event reported through the incident reporting system.

4.  Reference
