**MEDICAL TECHNICAL REFERENCE NOTE**

**Title:** **AMPUTATIONS AND DISMEMBERMENT IN THE USAR ENVIRONMENT**

**Last revised: March 2023**

## 1. Background

- Amputations (live victims) and dismemberment (deceased) have always generated much discussion in the USAR community, and are complex procedures with social, religious, and ethical aspects to be considered in the collapsed structure environment.

- Though there may be rare situations in which these two procedures are indicated, as a last resort, the better course of action is to avoid these if at all possible.

## 2. Amputations

2.1 Pre- Procedure

Decision Making

- Making the correct decision whether or not to perform an amputation in the USAR environment is critically important with life-long implications for the patient.

- There are numerous ethical, cultural, religious, clinical, practical, and psychological implications associated with amputations in the collapsed structure environment. These may be compounded in an international deployment setting.

- USAR amputations should be considered a procedure of absolute last resort, when the patient is entrapped by a limb, and:
    - The patient's clinical condition is life-threatening and requires immediate extrication to prevent loss of life;
    - The environment poses such a high-level risk to the patient such that it cannot be mitigated and is life-threatening;
    - The patient's degree of entanglement or entrapment is such that extrication is not possible without amputation.

- Essential persons in the decision-making process should include:
    - Treating medical professional;
    - USAR team medical manager
    - On-site USAR rescue manager

- Patient (if possible / practical);
- Family members (if possible / practical);
- USAR engineer (if possible/practical);
- USAR team leader / deputy team leader (if possible/practical);
- Representative from LEMA (if possible / practical).

- The decision-making process should include verification that no other techniques could be utilised to extricate the patient – such as undermining the trapped body part. In numerous instances, amputation can be completely avoided through this technique or through examination of anatomical position in the rubble. This may involve discussions with some of the above listed experts.

- It is recognised that in some circumstances it may not be possible or practical to consult with all or any of the persons described above. A recommended practice in this situation, should be to consult at least one other medical professional, even if they are a member of another USAR team.

- There are multiple international limb salvage score criteria. These are intended for use in the controlled environment of the operating theatre with full access to the patient. Even these can be questioned retrospectively when applied. These are not relevant in the USAR environment where amputation is only conducted for immediate life saving purposes.

- It is strongly recommended that the USAR team establish and implement a decision-making process regarding amputations. Ideally this should include a procedure and equipment checklist to be used in the field. It is also recommended that teams carry equipment and supplies to perform and or complete a USAR amputation.

- If possible or practical, document the decision-making process.

Preparation

- Once the decision to perform an amputation has been made, the following should be established, as circumstances permit:
  - Transportation plan for the patient post extrication;
  - Appropriate receiving medical facility;
  - An individual to assist the provider with the procedure (ideally a healthcare professional);
  - Appropriate equipment and medication for the procedure;
  - Adequate personal protective equipment e.g., additional gloves; protective garments, goggles, etc;
  - Medical action plan for the procedure and subsequent extrication plan.
    - Consider environmental constraints imposed by the confined space environment (limited patient access, lighting, noise etc);
  - Briefing for the team on planned procedure and extrication
  - Equipment assembly point as close to the patient, and in the most “sterile”

conditions possible.

2.2 Procedure

This procedure should only be performed by a physician or under direct physician supervision

Anaesthesia and Analgesia

- USAR medical professionals are obligated to ensure adequate anaesthesia and analgesia, during and post-procedure, with associated monitoring.

Technique

- The World Health Organization (WHO) has established practice guidelines on amputations in disaster situations, refer to *Best Practise Guidelines on Emergency Surgical Care in Disaster Situations, Section 12, Amputations, Page 15 – 17*:
    - Divide the skin, muscle, and bone at or near the same level, without attempting to fashion flaps or close the wound.
    - Tie all bleeding vessels and cut the nerves sharply while under gentle tension, allowing them to retract into the wound. Tack skin flaps loosely with a few stitches to prevent further retraction. Apply a sterile dressing and, if possible, an elastic stump wrap.
    - Debride and lavage the wound every 2–5 days until it is free of dead tissue and infection. At that point, perform a definitive amputation and closure.

- In the confined space environment, the following points must be considered:
    - Administration of an appropriate broad-spectrum antibiotic, if available;
    - Proximal control of haemorrhage is of paramount importance pre and post procedure;
    - A guillotine amputation performed as distally as possible on the affected limb/s is the preferred method;
    - Use of a wire saw e.g., Gigli saw, rather than a fixed blade saw, may be more suitable in a confined space environment;
    - Maintain vigilance of the risks posed by surgical instruments, bone fragments and body fluids during the procedure;
    - Apply antiseptic agent to the amputated stump if available and dress the wound appropriately;
    - If a tourniquet has been applied, leave the tourniquet in-situ until the patient is handed over to the most appropriate medical facility available.

2.3 Post Procedure

- Maintain adequate levels of anaesthesia and analgesia;
- Ensure proximal haemorrhage control;
- Ensure adequate protection of the amputated part that remains in the rubble and note its location for possible future retrieval;
- Debrief personnel involved with the procedure and include potential mental health concerns/wellbeing.

## 3. Dismemberment

- Making the correct decision whether or not to perform a dismemberment in the USAR environment can be very challenging. Dismemberment in some countries may, in fact, be illegal.
- The decision-making process, personnel involved, and procedure are similar to those for USAR amputation as described above. However, the reasons for this procedure differ.
- The only absolute indication to perform a dismemberment procedure is to gain access to a living patient.