

IN PRACTICE

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**“SNAKES...WHY DID IT HAVE TO BE SNAKES?”
- A MULTIDISCIPLINARY IN-SITU SIMULATION
TO TEST AND IMPROVE OUR RESPONSE
TO A RARE BUT SIGNIFICANT EVENT:
OCCUPATIONAL DENDROASPIS POLYLEPIS
ENVENOMATION**

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Introduction: The Centre for Snakebite Research & Interventions at the Liverpool School of Tropical Medicine (LSTM) houses >150 venomous snakes. This includes the black mamba (*Dendroaspis polylepis*) which can cause life-threatening features within 30-minutes of envenomation [1,2]. Early care is essential to prevent death and disability, with the Royal Liverpool University Hospital (RLUH) being the closest point of care.

Clinicians, snakebite experts and herpetologists updated an existing standard operating procedure (SOP) for the safe transfer and acute management of occupational snakebite envenoming between LSTM and RLUH. In-situ simulation was

used to test the SOP, as well as the ability of RLUH to receive such a patient.

Methods: We conducted an in-situ simulation of a black mamba envenoming at the LSTM herpetarium, utilising a simulated patient. The scenario continued in real time to arrival and management in the emergency department (ED).

Implementation of the SOP was evaluated by senior clinicians and snakebite experts with further feedback obtained during a human-factors focused debrief.

Results: Several processes that required review were identified. These included:

Key roles and responsibilities for the LSTM staff needed further clarification particularly in regard to the responsibility of communicating information to RLUH clinical teams:

- Handover between teams as information was not fully cascaded to all the relevant clinical teams
- There was limited knowledge and experience within the ED in managing snakebite envenoming
- Lack of clarity with regards to how to seek expert assistance and escalation from the assessing clinician
- Lack of familiarity of anti-venom risking inappropriate administration.

Discussion: As a result of the in-situ event several improvements to the SOP have been implemented. These include:

- The development of first and second responder roles at the LSTM
- Clearly defined communication responsibilities
- Specific pre-alert routes between the LSTM and RLUH
- Refinement of a quick reference guide for ED doctors and decision to transfer this with the patient to aid in a timely and informed assessment
- Expired anti-venom will no longer be transferred with the patient, but is available at LSTM if guided by expert advice.

It is expected these changes will result in improved management of occupational snakebite envenoming however, this is an iterative process. Existing SOPs require further review, and a simulation scenario is being developed to improve familiarity amongst the ED clinicians. We plan to repeat the in-situ simulation and include other clinical teams to identify any additional latent errors.

Ethics statement: Authors confirm that all relevant ethical standards for research conduct and dissemination have been met. The submitting author confirms that relevant ethical approval was granted, if applicable.

REFERENCES

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