

# A touch of added realism: Preparation of your patient simulator for internal haemorrhage

Colin Harwood<sup>1</sup>, Guillaume Alinier<sup>2</sup>

Hertfordshire Intensive Care & Emergency Simulation Centre  
University of Hertfordshire, UK

## Background and Goal

To help trainees act as themselves during a scenario-based simulation session adequate preparation of the patient simulator is required. The aim of this abstract is to present a minor modification made to a simulator used in a scenario that includes an internally haemorrhaging post-operative patient with a clean bandaged wound and a vacuum drain in place.

## Material and Methods

The vacuum drain needs to be slightly modified to operate correctly. Its tubing is shortened and the one way valve assembly is discarded before insertion into the mannequin's abdomen, under the bandage (Picture 1). A long extension plastic tube is affixed to the vacuum drain tube using a connector. This extension tube is then fed through the abdomen of the mannequin or under its chest skin (Picture 2), and out via the posterior slot along with and strapped to the mannequin's pneumatic lines. The tube then runs under the floor, if possible, to the control room where a large syringe primed with simulated blood can then be connected to progressively start the haemorrhage (Picture 3). at the appropriate time during the scenario For large volume haemorrhage the vacuum indicator needs to be pierced to allow air escape.



Picture 1: Modified vacuum drain connected to the patient simulator.



Picture 2: Tubing fed under the mannequin's skin.

## Results and Discussion

In the example addressed a vacuum wound drain manufactured by Medinorm AG was used, although any similar type of drain can be modified to fulfil requirements. This setup could be applied to any desired wound site, such as on the thorax, hip or thigh. It enables the operators to simulate an internal post-operative haemorrhage in a fairly realistic manner. If a scenario does not require the wound drain, the bottle can easily be disconnected and the tubing stored in the mannequin's abdomen.



Picture 3: Primed syringe setup in the control room to create the haemorrhage.

## Conclusion

The more advanced a scenario is, the longer it normally takes to prepare the mannequin and the environment. However this setup enables rapid changes between scenarios and the tubing can be left attached permanently to be reused, as it can be hidden. Participants exposed to scenarios using this setup found it very realistic.

## Authors:

<sup>1</sup> Colin Harwood, BA, DipNEd, DipAdEd, RMN, SRN, ILTM  
Principal Lecturer  
School of Paramedic Sciences,  
Physiotherapy & Radiography

<sup>2</sup> Guillaume Alinier  
MPhys, PGCE, MInstP, CPhys  
HICESC Co-ordinator

## Correspondence:

Guillaume Alinier  
HICESC  
Faculty of Health & Human Sciences  
University of Hertfordshire  
College Lane, Hatfield, HERTS,  
AL10 9AB, UK.

Email: G.Alinier@herts.ac.uk  
[www.health.herts.ac.uk/hicesc](http://www.health.herts.ac.uk/hicesc)  
Tel: +44 (0)1707 286395  
Fax: +44 (0)1707 284199