**Hope for the best, prepare for the worst: the development of a multidisciplinary haemodialysis emergencies simulation training program**

**Introduction**

Haemodialysis is provided by a multidisciplinary team, comprising nurses, doctors and dialysis support workers. It is commonly undertaken in physiologically frail patients with multiple comorbidities. A number of uncommon emergencies exist that are specific to haemodialysis, such as air embolism, which may be rapidly fatal if not recognised. Human factors play a significant role in the outcome in medical emergencies.

Simulation exercises offer the opportunity to train for uncommon scenarios in a safe and controlled environment. It is increasingly used in a number of settings, such as during resuscitation training.

**Methods**

We collaborated with the local University simulation unit to develop HEST (Haemodialysis Emergencies Simulation Training). A high-fidelity mannequin with real-time elicitable clinical signs is used. Adaptations were made to the mannequin and simulation suite in order to maximise realism, including installation of a functioning haemodialysis machine and development of a false arteriovenous fistula allowing cannulation and connection to the dialysis machine during scenarios.

Doctors and nurses participate as a team within scenarios, which cover medical emergencies such as air embolism, anaphylaxis and cardiac arrest during haemodialysis. After each scenario, reflection is facilitated jointly by senior nursing and medical staff with reference to local and national guidelines. Education and feedback focuses on the recognition and management of the unwell patient, and human factors within the team.

**Results**

Development of scenarios has been iterative using feedback provided. 92% of trainees (n=26 to date) reported increased confidence in recognising and managing at least one (and often all) of the scenarios covered. Participants particularly valued the hands-on nature and the opportunity to train alongside other disciplines and staff from other dialysis units.

An unexpected benefit is that feedback and group discussion have highlighted potential clinical issues, such as the inaccessible location of equipment for treating anaphylaxis, which have been addressed. There are plans to follow up trainees to assess how the training has impacted upon their clinic work. We intend to incorporate training into the ‘Continuing Professional Development’ programme for dialysis unit staff.

**Conclusion**

We conclude that simulation can be successfully modified for a specific multidisciplinary training requirement. The use of this training has collateral value in detecting environmental and systems issues which impact patient safety.