



ROYAL OLDHAM HOSPITAL

MEDICAL SIMULATION

SUITE

CASE STUDY

Integrated video, audio and data solution increases advanced clinical training capacity at The Pennine Acute Hospitals NHS Trust.

Following an increase in demand for enhanced clinical training within The Pennine Acute Hospitals NHS Trust, The Royal Oldham Hospital began work on an 18-month project to construct a £600,000 state-of-the-art Simulation and Clinical Skills Centre.

A REALISTIC TRAINING ENVIRONMENT

The aim of the centre is to extend training beyond the North Manchester General Hospital, where currently 700 doctors, nurses and midwives receive advanced clinical training each year. The new facility includes two simulation bays including high-tech manikins, a consulting room environment and two debriefing rooms.

The variety of clinical settings is designed to help doctors, nurses, midwives and other clinical staff access the training they need in an environment that reflects their daily clinical practice.

Katherine Robertson, learning and organisational development project manager at The Pennine Acute Hospitals NHS Trust, explains, *"While the primary purpose of the new facility is to ensure clinical staff have the required knowledge and skills to provide patients with first-rate care, the suite also features additional training rooms to extend the training on offer. One of the simulation rooms mirrors a GP office, which will be used for training beyond purely medical and surgical processes."*

THE CHALLENGE OF AN EFFECTIVE DEBRIEF

The main challenge the hospital faced was collecting all the data from a training session for playback, including audio, visual and patient data, to ensure an effective debrief for trainees.

Pure AV was appointed to design, integrate and install an audio-visual solution for the simulation suite and crucially facilitate the recording, analysis and playback of activity for the debriefing process.

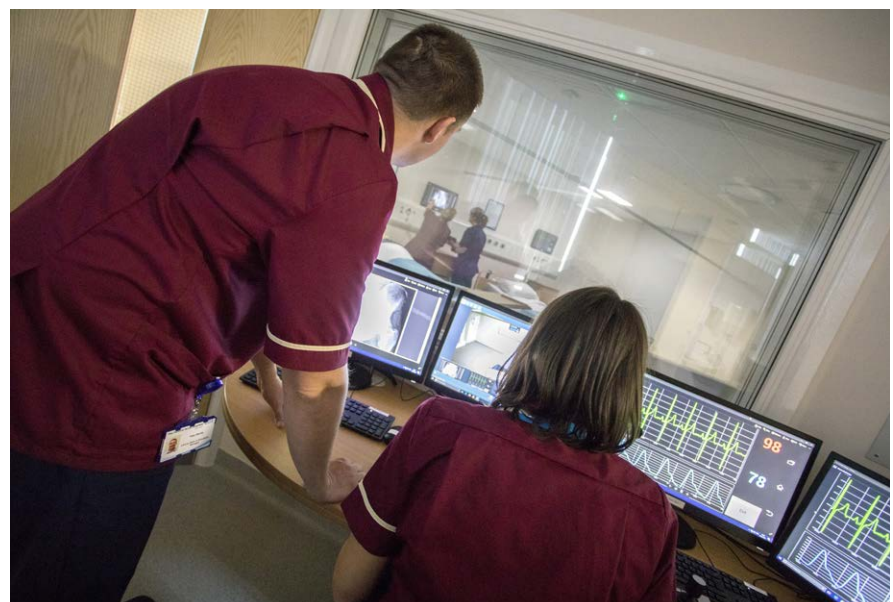
RICH FUNCTIONALITY ON A TIGHT BUDGET

A key challenge for Pure AV would be to deliver the rich technical functionality required within a very tight budget. Pure AV quickly ascertained that specialist medical simulation software was out of reach within the budget available.

The design team instead looked at alternative, mainstream technologies that could be applied to meet specification and budget.

"I've felt supported and the team has felt supported all the way through the project. The system is versatile, easy to use and the sound quality is crisp and clear."

TOBY GARRITY
Clinical simulation trainer



MANAGING MULTIPLE VIDEO, AUDIO AND DATA FEEDS

As the training takes place, every action and reaction of the trainees needs to be captured. Typically, medical data, such as scans, and vital signs are displayed within the training room. Any data shown or requested by the trainees needs to be captured. Requests for additional medical resources or specialist advice can be made from a telephone in the room and also need to be recorded. At the same time, any conversations or actions taking place around the 'patient' also need to be captured. It is necessary to see and hear close-up detail and maintain an overall view of the room.

As a result, a typical training scenario can require the management of up to 21 separate video, audio and data feeds.



COST EFFECTIVE VIDEO, AUDIO AND DATA INTEGRATION

Conventional AV recording, which typically only records one or two channels of video per device would require multiple synchronised devices and be expensive and over complicated for the user. IP-based video surveillance systems were therefore considered. The advantage; their ability to record multiple streams of video and play them back in synchronisation using timeline-based software bundled with the recorders.

There are, however, some issues that need to be addressed for this type of system to work successfully in a simulation suite environment.

ENHANCED AUDIO MANAGEMENT

A key consideration is audio. Many network camera companies do not offer audio of sufficient quality for use in this application; with latency and lip sync errors a potential issue that Pure had to address.

Careful research of product options enabled Pure AV to identify Axis, a manufacturer of a broad range of cameras and user-friendly recording and software packages. Their systems feature superior audio encoding capability and are able to provide good quality multi-channel sound with minimal and constant latency.

As Tony Crossley, pre-sales technical director at Pure Audio Visual, confirms, *"One of the biggest challenges we were facing when implementing this solution was integrating audio into the network. Axis had a significant advantage over its competitors in this scenario, as its audio solutions integrate seamlessly with its network video technology; ensuring lip syncing is in-line with the video output. Many network camera companies don't have this functionality."*



EASY USER CONTROL

Integration with high quality microphones from Audio Technica and Revolabs and audio processing by the BBS Blu series of processors allowed us to power, EQ and balance the microphones, distribute the audio to the right areas of the system and compensate for the small amount of latency in the system. This was facilitated by three AXIS P8221 Network I/O Audio Modules, seamlessly plugging into the network video system.

While most of the audio capture is automatic, there is still a need for a certain amount of adjustment to microphone selection and levels of gain. This is delivered through an Extron control system with a touch screen interface to make adjustments simple and straightforward.



EFFECTIVE DEBRIEF

Post-exercise, a thorough debriefing session takes place. The events and actions taken are replayed on a 75" display. The built in timeline software of the IP surveillance system is accessed via a wireless keyboard and used by the trainer to analyse and discuss the activity.



Katherine Robertson, learning and organisational development project manager at The Pennine Acute Hospitals NHS Trust, states, *"The system installed by Pure AV allows all aspects of the training undertaken to be analysed and detailed feedback to be given to delegates, helping them to develop the skills needed to deal with the challenges faced on a daily basis within a real hospital environment"*.

Through a precise understanding of client needs, Pure AV has overcome budget constraints to deliver an effective, user-friendly Simulation Suite. The Royal Oldham Hospital anticipates that it will successfully upskill 1,400 clinicians per year within its new facility. Meaning approximately 2,100 staff within The Pennine Acute Hospitals NHS Trust will have access to hands-on training that supports them in their role, helping to provide a higher level of patient care.