



## SIMULATION AND VR IN CLINICAL EDUCATION AND PRACTICE – MULTIDISCIPLINARY PERSPECTIVES

Virtual event

CPD: UP TO 6 CREDITS (3 PER DAY)



Bayer have part  
funded this event

**PHILIPS**



**SIEMENS**  
Healthineers



# SIMULATION AND VR IN CLINICAL EDUCATION AND PRACTICE – MULTIDISCIPLINARY PERSPECTIVES

## Virtual event

CPD: UP TO 6 CREDITS (3 PER DAY)

Given the rise in recent years of the interest and the use of simulation and virtual reality in healthcare, the BIR is hosting a meeting on the use of simulation and VR for clinical education and training.

The event will primarily focus on experiences in both radiology and radiotherapy, but look to involve multidisciplinary perspectives from outside these two main professions, from which to learn and also to share expertise. It looks to share expertise and best practice for using simulation and VR in medical education and practice; focusing on radiology and radiotherapy, but bringing in perspectives from other healthcare disciplines and beyond for a true cross-fertilisation of ideas.

## Join us

Join the BIR today to benefit from reduced delegate rates for our events.

For membership information visit:  
[www.bir.org.uk/join-us](http://www.bir.org.uk/join-us)

## Programme organiser

Dr Mike Kirby, Lecturer of Radiotherapy Physics, Director of Studies, University of Liverpool

Day 1: Tuesday 13 October  
13:00-15:35 BST

13:00	Welcome and introduction
13:05	<b>The Liverpool Radiotherapy Simulation Centre – professional and interprofessional experiences</b> Ms Sarah-Jane Ketterer, Radiotherapy Lecturer, University of Liverpool
13:25	Q&A
13:35	<b>Experience with VERT for teaching the physics of photon and charged particle therapy</b> Dr Mike Kirby, Lecturer of Radiotherapy Physics, Director of Studies, University of Liverpool
13:55	Q&A
14:05	<b>High fidelity simulation in diagnostic radiography education: A potential replacement for clinical hours?</b> Ms Emma Hyde, Head of Diagnostic Imaging, University of Derby; and Ms Naomi Shiner, Senior Lecturer in Radiography, University of Derby
14:25	Q&A
14:35	<b>Peer Enhanced e-Placement (PEEP) completed by Occupational Therapy students - practical guide and pedagogical value</b> Dr Lisa Taylor, SFHEA Associate Professor in Occupational Therapy, Associate Dean for Employability for the Faculty of Medicine and Health, University of East Anglia
14:55	Q&A
15:05	<b>Technical skills training – using augmented reality as part of a stage-based simulation programme in surgery</b> Dr Maulik Gandhi, Consultant Orthopaedic Surgeon, Technical Skills Lab Lead, NHS Clinical Entrepreneur, Bradford Teaching Hospitals NHS Foundation Trust
15:25	Q&A
15:35	End of day 1

Day 2: Wednesday 14 October  
13:00-15:35 BST

13:00	Welcome and introduction
13:05	<b>VR and immersive systems for orthoptics education</b> Dr David Newsham, Head of Orthoptics, University of Liverpool
13:25	Q&A
13:35	<b>The role of AR and VR in interventional radiology training; opportunities and challenges</b> Professor Mo Hamady, Faculty of Medicine, Department of Surgery and Cancer, Imperial College London
13:55	Q&A
14:05	<b>The role of simulation in police training and joint agency investigation</b> Mr Brian McNeill, Senior Lecturer in Policing, Edge Hill University
14:25	Q&A
14:35	<b>Simulation in modern nursing education programmes</b> Mr Samuel Pullan, Lecturer in Nursing, University of Liverpool and Ms Vicky Garner, University of Liverpool
14:55	Q&A
15:05	<b>Simulation for radiotherapy – partial replacement of clinical placement</b> Dr Pete Bridge, Senior Lecturer, University of Liverpool
15:25	Q&A
15:35	Close of event

# Biographies and abstracts

## **Mr Brian McNeill, Senior Lecturer in Policing, Edge Hill University**

Brian McNeill is a Senior Lecturer in Policing at Edge Hill University and was previously the Head of the Continuous Professional Development (CPD) Department within the Liverpool Centre for Advanced Policing Studies at Liverpool John Moores University.

He retired from Merseyside Police in 2011 after 30 years service. His last position with that force was Detective Chief Superintendent - Head of Crime, prior to which he was Director of Intelligence, Head of Special Branch and Scientific Support. As an accredited Senior Investigating Officer he had responsibility for leading reactive and proactive investigations into all levels of homicide including Category A+ Murders, Counter Terrorism, corruption and covert operations into serious and organised crime.

Since retirement, he has performed the role as Staff Officer to the National Policing Crime Business Area, which involved the oversight, coordination and support of 12 Portfolios and 119 National Working Groups with responsibility for national and strategic level issues around policy, guidance and training. More recently, he has been a member of the NPCC National Coordination Team for all police forces in relation to the Public Inquiry into Undercover Policing. Brian has been commended on 22 occasions and was awarded the Queens Police Medal in the New Year Honours List in 2011 for 30 years distinguished police service.

## **The role of simulation in police training and joint agency investigation**

This presentation will look at the use and development of simulation and virtual reality in undergraduate degree programmes in policing and the potential to progress this into joint agency work and investigations that involve health and social care professionals.

---

## **Dr David Newsham , Head of Orthoptics, University of Liverpool**

David Newsham first worked as a clinician following qualification in 1991, first as a Senior II Orthoptist, then later as Senior I at St Helens and Knowsley Hospitals NHS Trust. Following this he took up the position of Lecturer in Orthoptics at the University of Liverpool in 1995 before being promoted to Senior Lecturer in 2012 and is currently Head of Orthoptics, since 2014. His clinical research interests are amblyopia, intractable diplopia, suppression, adherence to treatment and quantitative oculomotor control and educational research interests are in the development of VR to aid clinical competence. David has presented and published on these topics in a variety of international journals and conferences. He served as Editor of the British and Irish Orthoptic Journal between 2012 and 2016, acts as a peer reviewer for a number of international ophthalmic journals/reviewer for external grant funding bodies and currently sits on the Editorial Board of the Center for Ophthalmic Educators of the International Council of Ophthalmology. Also, outside the university he is a Partner of the HCPC in the roles of both HCPC Visitor and Panel Member for Fitness to Practice and is the lead for Education and Research for the International Orthoptic Association where he represents the UK and Ireland.

## **VR to enhance clinical competence in orthoptics and other health settings**

Healthcare programmes are increasing the number of students being trained in line with government initiatives following the change from a commissioned-based to a fee-based education model for allied health professions and nursing. This has large benefits to increase the workforce but places huge demand on placement capacity for clinical education. Simulation and virtual reality are therefore timely strategies to aid clinical education and even more so as a result of the current constraints due to COVID-19. This presentation explores how VR has been used in related health settings to aid clinical teaching and competence and how this is being applied to orthoptic education via our collaboration with the Virtual Engineering Centre at the University of Liverpool.

# Biographies and abstracts

---

## **Ms Emma Hyde, Head of Diagnostic Imaging, University of Derby**

Ms Emma Hyde is qualified Diagnostic Radiographer who is passionate about patient centred care and student radiographers transition to clinical placement. These interests have led her to embrace simulation as a pedagogic approach that supports students transition to placement, and assists them to develop patient centred approaches.

## **High fidelity simulation in diagnostic radiography education: A potential replacements for clinical hours? (Joint talk with Ms Naomi Shiner)**

Research has shown that Diagnostic Radiography students find the transition from the academic environment to their clinical placement challenging. Alongside this, workforce shortages and the impact of COVID-19 are putting increasing on diagnostic services. Simulation based education could provide a way to potentially support students transition to placement and increase placement capacity. Alongside this, simulation provides a safe environment for students to practice patient centred approaches to imaging.

---

## **Dr Lisa Taylor, Associate Professor in Occupational Therapy, University of East Anglia Norwich**

Dr Lisa Taylor is an Associate Professor in the School of Health Sciences at the University of East Anglia, Norwich. Lisa is also Associate Dean for Employability for the Faculty of Medicine and Health, and is passionate about employability. Lisa has developed innovative and widely adopted employability initiatives in her employability role. Lisa has published her employability work, presented at several employability conferences and has edited a book - "How to Develop your Healthcare Career – a guide to employability and professional development". Lisa led the development of the Peer Enhanced e-Placement (PEEP).

## **Peer Enhanced e-Placement (PEEP) completed by Occupational Therapy students - practical guide and pedagogical value**

In response to Covid-19 the fact to face 2nd year Occupational Therapy practice placements at the University of East Anglia, Norwich, were suspended. The Peer Enhanced e- Placement (PEEP) was organised as an alternative model of practice placement delivery, using the virtual learning environment Blackboard. The PEEP was evaluated and unearthed some valuable learning from this model of placement delivery. This presentation will explore the PEEP case study and the pedagogy underpinning the learning that was reported in the evaluation. The next steps for the PEEP will also be outlined.

---

## **Professor Mo Hamady, Professor in Practice in Image Guided Surgery and Interventional Radiology, Imperial College-London**

Professor Mo Hamady is a Professor of practice in Interventional Radiology and Image Guided Surgery at Imperial College-London. His research interests include aortic stent grafting and advanced embolisation techniques, robotic endovascular intervention and navigation, and virtual reality simulation training of endovascular skills. He has over 170 papers in peer-reviewed journals and 12 book chapters. He has given over 70 talks and keynote lectures in national and international scientific meetings in the last 5 years. Prof. Hamady has done the world-first robotic endovascular aortic intervention in 2008 and the world-first robotic fibroid embolisation in 2012 and UK first robotic prostate artery embolisation in 2017. He served several prominent roles in scientific and education committees of national and international learned societies, including British Society of Interventional Radiology, Cardiovascular and Interventional Radiological Society of Europe and Pan Arab Interventional Radiological Society.

---

# Biographies and abstracts

## **Revd Canon Dr Mike Kirby, University Lecturer – Radiotherapy Physics, Radiotherapy Directorate, School of Health Sciences, University of Liverpool**

Dr Mike Kirby has worked in radiotherapy physics since 1988, starting at the Christie Hospital and then Rosemere Cancer Centre, Preston as Principal/Consultant Physicist and Deputy Head of the Radiotherapy Physics Group. He moved back to the Christie in 2007 as scientific lead and Head of Radiotherapy Physics (Satellite Centres) for developing the Christie Satellites in Oldham and Salford. He's served on IPEM, BIR and multidisciplinary committees and co-authored/edited IPEM Reports 92, 93, 94 and 'On Target' (2008/2019). He presently chairs the BIR's Oncology and Radiotherapy SIG; is a task group member for the APPG-RT; an expert lecturer for the IAEA, supervises on the HSST programme and is a member of IPEM, AAPM, ASTRO, ESTRO and the BIR. Most recently, he's co-authored a textbook for RT students and trainees on On-Treatment Verification Imaging/IGRT for CRC Press. Mike is also a Residentiary Canon (Canon Scientist) at Liverpool Cathedral in the Church of England.

### **Experience with VERT for teaching the physics of photon and charged particle therapy**

The use of a Virtual Environment for Radiotherapy (e.g. VERTTM) is an ideal way we have found at the University of Liverpool, to help students engage better and more fully in understanding key Radiotherapy principles, in an interactive and dynamic manner. Being a virtual environment has the benefits of safety, not requiring precious Linac time and also enabling internal visualisation simply not possible in the real-world environment.

We have used VERTTM Physics, a specialised module within VERTTM, successfully for over six years now at the University of Liverpool in both 2D and 3D immersive modes for teaching fundamental concepts of Radiotherapy Physics to undergraduate and postgraduate radiotherapy students. Our current methods for teaching certain concepts have now focused on using workbooks and practical (interactive) demonstration of percentage depth dose data; how it is acquired and verified, and the concepts of independent data sets. The learning is blended, involving expert tuition and peer-to-peer learning with students discussing and predicting effects between themselves in small groups (such as changes in fieldsize, energy, FSD) and then confirming predictions using the VERTTM Physics software for photons. Different modalities are also considered and compared by the students (notably electrons and protons, considering surface doses, dose at depth and beam energies), bringing results together individually in specially prepared workbooks and then collectively as a group on whiteboards. Over the years, for these methods, evaluation and feedback has been excellent, especially regarding the small group methods; the results of which have been previously published [1, 2]

We have used the same format of using workbooks and practical (interactive) demonstration and involvement, most recently to teach key aspects of proton beam therapy. Following a traditional, didactic style of lecture, with interactive Q and A, we used the new proton VERTTM module to examine further, proton beam treatments and delivery. Our cohort evaluations (from 2nd yr UG and PG students) for this style of teaching and learning have also proved very positive and been published recently [3], showing most had a high level of satisfaction and enjoyment from the teaching experience, with over 90% wishing for the methods to be repeated. All agreed it improved their understanding of the characteristics of proton beam therapy, especially in terms of visualising the beams and dose deposition. Most felt it was realistic and that their understanding improved. Feedback indicated that for future sessions, they would like smaller groups (similar to our experiences and methods reported for different uses of VERT [1, 2, 4]), more clinical cases and more time for the sessions. These aspects have been factored into our scheduling for teaching in the future for both photons and protons.

Our experiences from both these aspects of teaching and learning using these simulation and VR based methods will be shared in this presentation

# Biographies and abstracts

## **Dr Pete Bridge, Senior Lecturer, University of Liverpool**

Dr Pete Bridge is currently a Senior Lecturer in Radiotherapy at the University of Liverpool where he teaches radiotherapy planning, physics and research skills. Prior to this, he worked as a senior lecturer and undergraduate course coordinator at Queensland University of Technology in Brisbane, Australia. Pete's research interests lie in innovative radiotherapy education and particularly the use of simulation. He conducted the first evaluation of a virtual linear accelerator educational resource prior to its commercialisation as VERT (Virtual Environment for Radiotherapy Training) and has led several funded projects related to use of simulation as partial replacement for clinical placements. He has published on a wide range of educational innovations ranging from VR applications to engaging patients to provide student feedback. He co-authored the "CT Anatomy for Radiotherapy" textbook and currently delivers training on MR Anatomy for Radiotherapy. Pete's PhD concerned the use of 3D immersive visualisation for radiotherapy structure outlining and he has just completed supervision of another project investigating use of 3D VR for IGRT image fusion. Despite this he maintains that he is not a geek. In his spare time he enjoys mountains, mud and good beer.

## **Simulation for radiotherapy – partial replacement of clinical placement**

Pre-registration allied health courses throughout the UK depend on providing students with clinical placement opportunities. While much valuable learning takes place on these placements, for many courses the additional training burden generates significant capacity issues and restricts the throughput of learners. Clinical departments are under increasing pressure from rising patient numbers, limited staff availability and the need to provide ongoing training for existing staff and other learners. Recently the restrictions imposed by COVID-19 have added to this pressure.

Our previous project has successfully used simulation to provide students with a simulated placement. This may have a valuable role to play in not only easing training burden, but also reducing associated financial and logistical pressures faced by students.

This paper discusses the potential solutions, opportunities and challenges related to use of simulation placements in lieu of SOME clinical placement time. Simulated placements provide a unique opportunity embed clinical simulation activities within a cohesive and realistic framework. This has great potential benefit in helping students to gain interpersonal skills, confidence and an understanding of safe working but also to apply these to their clinical practice.

---

## **Ms Sarah-Jane Ketterer, Radiotherapy Lecturer and Simulation Lead, University of Liverpool**

Ms Sarah-Jane Ketterer is a Radiotherapy Lecturer and Simulation Lead for the School of Health Sciences at the University of Liverpool. She has worked in academia for almost four years, and prior to that had a clinical career within the NHS and private sector. She has a special interest in the use of simulation for clinical skills training, and is enthusiastic about adding to the evidence base for its wider adoption within the health sciences.

In her leisure time, Sarah-Jane enjoys spending time with her family outdoors, learning Italian, anything to do with history and partaking in afternoon tea!

## **The Liverpool Radiotherapy Simulation Centre – professional and inter-professional experiences**

The Radiotherapy department at University of Liverpool has recently expanded their simulation resources and provision, and has completed evaluations of both undergraduate simulation placements and inter-professional simulation activities. This presentation will aim to give an overview of experiences using simulation for clinical skills training, and to address some of the challenges encountered in implementing these activities, particularly in light of recent restrictions imposed by Covid-19.

# Biographies and abstracts

---

## **Mr Samuel Pullan, Lecturer in Nursing, University of Liverpool**

Mr Sam Pullan is the module leader for the Public Health module in the Bachelor of Nursing Degree. He also works with Ms Vicky Garner to coordinate and organise our simulation experiences at the University of Liverpool. As well as working as a lecturer, he also continues to practice as a staff nurse in a local Accident and Emergency Department. He loves both jobs, and feels lucky as each job helps his practice in the other. Working as a staff nurse in A&E gives real credibility with his students. He is a member of the team doing the job they are aspiring to do, and will often be able to talk through a concept of nursing, using real world examples of how it has helped him care for his patients. His research interest is primarily in simulation, public health and health policy, and major incidents. Due to his clinical relevance he will often be found teaching simulation, clinical skills sessions, and preparatory tutorials for the third-year nurses on 'real nursing life'. Working in both A&E and University of Liverpool has taught him the great impact and ease that can be found from working interprofessionally. He looks forward to hearing what other professions have been using simulation techniques for and their effectiveness in health education.

## **Simulation in Modern Nursing Education Programmes (Joint talk with Ms Vicky Garner)**

Vicky and Sam are going to be talking through their experiences of simulation within their programme. This will pay attention to student satisfaction, student learning, and the soft and hard skill acquisition available within nurse simulation. This presentation will also pay attention to outcomes available from both high, medium and low fidelity simulation. Finally rounding up to looking to the future of our practice within nurse simulation.

---

## **Ms Vicky Garner, Lecturer, University of Liverpool**

Ms Vicky Garner is a Registered Nurse with more than 35 years' experience in nursing. She is currently a lecturer in undergraduate nursing at the University of Liverpool focusing on clinical skills training. She also teaches on the post graduate MSc Nursing programme.

Her additional roles include student support in both the University and whilst the students are on practice placement and the facilitation of clinical skills development through simulation throughout the undergraduate curriculum. Her background is in Accident and Emergency nursing which she is still passionate about. She held various posts in A&E departments including senior sister, team leader and clinical educator. She has for the last 12 years focused on education in the University settings.

## **Simulation in Modern Nursing Education Programmes (Joint talk with Mr Samuel Pullan)**

Vicky and Sam are going to be talking through their experiences of simulation within their programme. This will pay attention to student satisfaction, student learning, and the soft and hard skill acquisition available within nurse simulation. This presentation will also pay attention to outcomes available from both high, medium and low fidelity simulation. Finally rounding up to looking to the future of our practice within nurse simulation.

---



# Biographies and abstracts

## **Dr Maulik J Gandhi, Consultant Orthopaedic Surgeon, Technical Skills Lab Lead, NHS Clinical Entrepreneur, Bradford Teaching Hospitals NHS Foundation Trust**

Mr Maulik J Gandhi (Mal) is a Consultant Orthopaedic Surgeon at Bradford Teaching Hospitals NHS Foundation Trust. He is also the Technical Skills Lab lead at the Trust. He completed his MBChB (Hons) and BSc (Hons) from the University of Manchester. Alongside clinical practice, he has completed a Masters (MPhil) degree from the University of Salford using a novel low fidelity simulator he designed for key hole surgery. He is one of the first NHS Clinical Entrepreneurs (NHS England) and is one of the directors at MAVRIC (Medical and Augmented Virtual Reality Innovative Coaching).

Mal's passion is to merge clinical practice, innovation and simulation training. He enjoys spreading his ideas on the stages of technical skills training and has been invited to present at national and international forums on this. He challenges people to think about what is possible, and would love to see a low fidelity simulator in everyone's home.

Mal has a keen research interest and has published in the fields of simulation and orthopaedics and been a reviewer for well-known orthopaedic journals including the "Journal of Bone and Joint Surgery" and "Shoulder & Elbow" amongst others. He is very approachable and loves discussing projects which may benefit patients, trainees and trainers alike.

### **Technical skills training – using augmented reality as part of a stage-based simulation programme in surgery**

There are challenges and a learning curve when developing any technical skill from playing an instrument to surgery, from knitting to performing image guided biopsies. In our field, what is common is we need resources to help us train, keep patients safe and provide feedback to excel. How is all this possible when our time and resources are limited?

Mal explores how using a stage based approach to surgical training for key hole surgery, he has identified an area which we could develop and help bridge the gap using Augmented Reality. Although his expertise lies in shoulder key hole surgery, the technology can be applied to any field and this talk shows what he has achieved and seeks to inspire others in their own fields.

---

## **Ms Naomi Shiner, Senior Lecturer, University of Derby**

Ms Naomi Shiner qualified in 2000 specialising in Reporting Radiography in 2003 and continues to support the NHS in this role to this present day. Starting her academic career in Robert Gordon University in Aberdeen, Naomi now works at the University of Derby. Naomi is responsible for several modules and is the simulation lead for the discipline area. In this role Naomi supports staff to use this pedagogical approach, developing a variety of simulation activities for integration into the curriculum. As a doctoral student Naomi is applying this knowledge to develop simulations supporting students to transition from academia to clinical practice.

Naomi has a number of publications focused on simulation-based education in Radiography and is open to collaborative work.

### **High fidelity simulation in diagnostic radiography education: A potential replacement for clinical hours? (Joint talk with Ms Emma Hyde)**

Research has shown that Diagnostic Radiography students find the transition from the academic environment to their clinical placement challenging. Alongside this, workforce shortages and the impact of COVID-19 are putting increasing pressure on diagnostic services. Simulation based education could provide a way to potentially support students transition to placement and increase placement capacity. Alongside this, simulation provides a safe environment for students to practice patient centred approaches to imaging.

# SIMULATION AND VR IN CLINICAL EDUCATION AND PRACTICE – MULTIDISCIPLINARY PERSPECTIVES

Virtual event



The British  
Institute of  
Radiology



@BIR\_News



/britishinstituteofradiology



The British Institute of Radiology

48–50 St John Street, London, EC1M 4DG  
[www.bir.org.uk](http://www.bir.org.uk)

Registered charity number: 215869

