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'The Resus Doll Is Dead, What Now?' End-of-Life Care Teaching and Simulation: A Literature Review

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**Background:** Simulation & high-fidelity simulation involves using manikins, clinical training suites, wards, computer programs and theatres in medical teaching. These teaching formats have established themselves in medical undergraduate and postgraduate education. Rated highly among students, they have also been shown to be effective learning tools.

**Aims:** To reduce the potential risk to patients and their proxy associated with learning 'at the bedside', which can pose a challenge in medical and in particular palliative settings. Education and training methods that do not expose patients to preventable communication blunders from less experienced practitioners are a priority. Simulation and high-fidelity simulation provides a way for students and doctors to train safely, before entering real-life scenarios.

**Methods:** We provide a summary review on the current literature and evidence for simulation and high-fidelity simulation in palliative and end-of-life care settings, and discuss potential uses of technologies including virtual and augmented reality in future training.

**Results:** The most common form of simulation in palliative medicine is often an actor-based role-play scenario with particular emphasis on communication skills. This is expensive and time-consuming to set up. Less evidence was found on the use of high-fidelity simulation in end-of-life care teaching.

**Conclusion:** Palliative medicine has been slow to adapt to an educational method and environment that now is widely used across other areas of healthcare. There has been less emphasis on training with manikins and even less on using computer simulation and virtual reality environments to recreate challenging end-of-life care scenarios. We provide some examples of where this could benefit the curriculum.

### Summary:

Simulation, and High Fidelity Simulation have been shown to be effective learning tools.<sup>1</sup> Simulation, where prepared actors portray common scenarios, is an effective strategy that addresses the ethical considerations of 'practicing' on human patients.<sup>2</sup> It may increase patient safety, improve clinical judgement and arguably create better communicators. The need for education and training methods that do not expose the patient to preventable errors of less experienced practitioners is an urgent priority.<sup>3</sup> A significant proportion of adverse events in healthcare are triggered by problems with communication, decision-making, leadership and teamwork, that is, non-practical, non-technical skills.<sup>4</sup> Challenges include expense and time to set up. Our literature review revealed that High Fidelity Simulation (HFS)<sup>5</sup> involving manikins is now a common educational tool in medical and nursing undergraduate curriculums. Scenarios generally revolve around acute specialties. Anaesthetics were an early adopter.<sup>6</sup> Death within simulation has been controversial, with concerns about causing distress, psychological harm or negative impact on students' confidence.<sup>7</sup><sup>8</sup> Although there is no educational consensus whether simulation manikins should 'die' in undergraduate scenarios, there is evidence that senior medical students find this a useful learning experience.<sup>9</sup> HFS improves end-of-life care learning for nursing undergraduates.<sup>10</sup> There may be a perception that HFS is not useful in palliative medicine education since it is a less acute specialty. There is a perceived lack of prioritisation for access to equipment and interventional techniques exposure. However, many university campuses will have simulation suites and technical staff that can be used in undergraduate teaching. Many

hospitals already have portable equipment for 'point of care' simulations set up anywhere onsite, or off-site, which provides great flexibility and is significantly cheaper.<sup>11</sup>

The medical literature contains few papers describing the use of simulation and HFS in palliative medicine. Fewer still appear to test the transferability of skills learnt in a simulated setting to real-life practice. Venkatasalu et al found that HFS better prepared nursing students for their first healthcare placements both emotionally and in terms of 'hands on' skills. Rayment et al<sup>12</sup> demonstrated improved confidence in advance care planning by generalists using simulation with actors. Scenarios involved a simulated ward environment, an HFS manikin and an actor playing a carer. In a small study of seven medical students, tutorials used HFS to teach communication skills for cardiopulmonary resuscitation with patients and carers.<sup>13</sup> Students reported that the HFS scenarios were more realistic than low-fidelity ('role-play') simulation. This improved learning from the sessions and confidence among some students. While simulation remains expensive and arduous to set up, it presents many potential palliative medicine learning opportunities. For example, Do Not Attempt Cardiopulmonary Resuscitation decisions for a deteriorating patient and discussions with their proxy can be readily integrated into an HFS. These can be linked into existing acute scenarios, thereby integrating palliative medicine with acute specialties. Simulation strives to be as realistic as possible; demonstrating a more realistic patient pathway can facilitate this.<sup>14</sup> Setting up different scenarios in different locations and at different times, including the out-of-hours community setting may make training more broad.<sup>15</sup> The reality that not every patient with an acute illness will recover, even with correct treatment, is a difficult lesson every junior physician faces with varying levels of support. Newly qualified doctors often cite death and terminal illness as a source of stress.<sup>16</sup> A common theme is the need to see and also practice difficult conversations, for instance around ceilings of treatment and resuscitation.<sup>17</sup> HFS, facilitated sensitively with an expert debrief, can explore this in a controlled environment, at the student level and beyond. Debrief is where most learning occurs in simulation.<sup>18</sup> This reflective process lends itself well to support students in dealing with death and dying. Advanced life support courses that teach

practical techniques may also give an opportunity to learn about some of the most challenging conversations in healthcare, making this an ideal setting. Palliative medicine trainees are expected to be able to manage and prove competencies in emergencies like anaphylaxis, opioid toxicity and terminal haemorrhage.<sup>19</sup> HFS is now used to train and assess palliative medicine trainees in these acute scenarios.<sup>20</sup> Simulation allows trainees to refresh and demonstrate competencies for infrequent but important events and is underutilised. It is time for realistic, simulated scenarios covering daily end-of-life care scenarios to be implemented at undergraduate and postgraduate levels.

The term virtual patients (VP) describes different modalities, from video-recorded actors to manikin training models for laparoscopic procedures. In this context, it relates to computer-generated simulated patients to develop patient encounter skills.<sup>21</sup> Meta-analyses demonstrate that VPs can improve communication skills and clinical and ethical reasoning.<sup>22 23</sup> Traditionally, communication skills teaching within palliative care includes role-play using simulated or standardised patients played by actors. However, VPs are increasingly being used alongside. VPs can standardise the learning experience across a curriculum and may be adapted according to curriculum requirements. Many medical schools develop their own VP scenarios. Use of VPs may help students improve communication skills and allows repeated practice in a safe environment.<sup>24</sup> For example, students can safely trial various communication strategies for breaking bad news without the fear of humiliation or causing distress. Virtual and augmented reality and gamification of real-life scenarios are likely to play an important part in future education.<sup>25</sup> This has been brought into new light through the Covid-19 pandemic, where face-to-face training opportunities were diminished and technology played an increasingly important role.<sup>26</sup> Trainees can be exposed to stressful situations in a near-real setting and choose options. It is already possible to simulate bystander cardiopulmonary resuscitation in virtual reality. Palliative care training computer games in virtual reality could be a mainstay of future education. One of the biggest challenges of current VPs is a sense of realism and authenticity.

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