GUEST EDITORIAL

The Story of Life Lines

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In early 2020, government mandates and hospital policies restricted in-person visiting due to the COVID-19 pandemic. This led to an urgent need to identify new communication solutions for critically ill patients and their family members that included virtual visiting. Having read about the tragic stories coming out of Northern Italy of patients taken to hospital via ambulance and dying in the ICU without their families seeing them again, myself and *Life Lines* co-founder Dr. Joel Meyer came together to find a solution. Initially, this solution was intended for our local hospital but rapidly snowballed into what became *Life Lines*, i.e., providing a virtual visiting solution for London hospitals and then for ICUs across the United Kingdom.

Life Lines was developed and is sustained through a unique partnership of clinicians, academics, companies, and charities. Using a research connection I had made previously with the CEO of the Canadian company Aetonix, I reached out to ask if they would help Joel and me develop a secure digital solution bespoke to the needs of intensive care.

In the UK we were rapidly entering a crisis situation due to the escalating numbers of patients requiring ICU admission due to COVID-19. Our requirements for this solution were to (1) meet digital privacy and security standards; (2) be exceptionally simple for stressed and overstretched staff to use; (3) be readily accessible and easy to use for family members; (4) be acceptable in terms of COVID-19 infection control requirements; and (5) be rugged – i.e. devices had to withstand use in a busy ICU environment. Following beta-testing we also added the need to work independently of the hospital Wi-Fi due to signal fluctuation and the risk of a video call dropping out and creating further family distress.

In a rather whirlwind like couple of weeks working 16-hour days we had come up with and tested a solution meeting these requirements using a very stripped-back version of the e-platform aTouchaway™. This enabled a tablet to function as a patient dashboard with family members once invited to use the aTouchaway app attributed to that patient. This meant staff could make a video call to the right patient and to the right family member with two taps on the tablet. There is no need to create individual meeting links or rely on staff personal devices or personal user accounts. Given the demands on ICU staff time, we blocked the two-way calling function, so only staff could initiate calls.

During this time, we realised we needed a tablet supply with an unlimited data plan and a way of delivering our solution beyond our hospital. We, therefore, reached out to big tech companies and potential donors. With some serendipity and some luck, we managed to establish partnerships with British Telecom who could help us secure a tablet supply (a major source of tablets was Wuhan, China where production had been suspended) and with Google enabling access to Android Enterprise. This meant we could lock our tablets into the virtual visiting solution and manage them from a distance. Every tablet was delivered already set up so that staff only had to enter a 4 digit pin to start using the *Life Lines* virtual visiting solution. We also secured one million pounds as charitable gifts from the True Colours and Gatsby Trusts, raised over £75,000 in public donations, and later received another substantial donation from Google.

Since this time *Life Lines* has provided over 1400 4G enabled Android devices to 180 National Health System (NHS) hospitals across the UK and has supported more than 132,000 virtual visits and over 1 million call minutes. As the primary responsibility of my job is to develop and conduct impactful research (with no prior experience of large scale digital innovation), we also developed a research programme around *Life Lines* which included an early UK survey of hospital-related visiting and communication practices during the pandemic (Rose et al, 2020), two descriptive interview studies relating to experiences with virtual visiting including 36 clinicians representing 14 hospitals (Xyrichis et al., 2021), and 41 family members from 16 hospitals (Rose et al., 2022a). We also recruited an observational cohort of over 2000 family members exploring distress and psychological wellbeing (Rose, et al., 2022b). Recruitment of family members for these studies was all done via the aTouchAway app while enrolled in virtual visiting, offering us a novel method to access family members.

Now that in-person visiting to the ICU has returned across the UK the Life Lines team continues to use digital innovation to improve the outcomes and experience of ICU patients and their family members. We continue to advocate for virtual visiting as an adjunct to in-person visiting for family members and

significant others unable to travel to the hospital due to distance, cost, or ill health, and those with incompatible work or caregiving commitments. We have developed an ICU e-diary using the aTouchaway platform, which has replaced paper diaries with the additional benefit of enabling family members to make entries via an invitation sent by the ICU staff. We have also developed a digital ICU recovery pathway that connects ICU survivors with a recovery coordinator to set bespoke recovery goals and a recovery plan that is monitored for the first 12 weeks following hospital discharge.

In conclusion, I am very proud of the *Life Lines* story and honoured to be able to share it in this edition of the International Journal of Critical Care. At the outset, we had no idea that our original intent to help our patients and family members would be scaled up to the extent that was achieved and sustained over the last three years. Hopefully, the *Life Lines* story will inspire others to achieve their goals and dreams for supporting patients, family members, and our own critical care colleagues.

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