Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Intensive care unit visiting using virtual technology: Barriers, solutions, and opportunities

Louise Rose [a,*], Andreas Xyrichis [a], Joel Meyer [b]

[a] Florence Nightingale Faculty of Nursing, Midwifery and Palliative Care, King's College London, London, UK
[b] Critical Care, Guy's & St Thomas' NHS Foundation Trust, London, UK

Introduction

Although the COVID-19 pandemic has presented the largest challenge to intensive care services ever experienced across the globe, out of necessity it has also sparked some innovations which may have ongoing benefit to patients and families. One such innovation is the implementation of virtual intensive care unit (ICU) visiting. Herewith, we consider opportunities for ongoing successful adoption of virtual ICU visiting as well as pitfalls to avoid.

In early 2020, the imposition of government mandates and hospital policies restricting in-person visiting led to new communication solutions that included virtual ICU visiting (Rose et al., 2020; Fiest et al., 2021). Yet, given that platforms that enable video technology such as Zoom and FaceTime have been available for a decade (Skype was launched in 2003), one might question why virtual ICU visiting was not already universally used as a routine option for family ICU visiting. ICU visiting and family-centred policies to-date have focussed solely on in-person visiting (Hunter et al., 2010; Ciufo et al., 2011; Davidson et al., 2017). These policies disadvantage family members and significant others unable to travel to hospital due to distance, cost, or ill health, and those with incompatible work or caregiving commitments (de Havenon et al., 2015). Given that the pandemic has fast-tracked the introduction of virtual ICU visiting, there are now lessons to be learnt as to barriers to its use, strategies to overcome these barriers, and future opportunities for using this technology.

Virtual ICU visiting barriers and strategies to overcome them

Virtual ICU visiting should be conducted with a patient and family-centred approach. As with in-person visiting, offering choice is paramount. Not all family members or significant others will want to visit virtually, and some may prefer a combined in-person/virtual approach. Overly restrictive virtual ICU visiting practices that create additional stress for families and patients such as were evident during the COVID-19 ICU peak surges should be avoided. For instance, restricting virtual visits to only the nominated next of kin can create conflict among the family unit and places on that individual undue responsibility to arrange access and updates for other family members or significant others. Inflexible virtual visit scheduling and/short visit durations can generate a perceived lack of control leading to emotional distress (Rose et al., 2022). As ICUs consider ongoing use of virtual ICU visiting outside of pandemic conditions, visiting policies should reflect a least restrictive yet pragmatic model of virtual ICU visiting practice.

Inadequate access, inappropriate use, or difficult to use technology can also impose barriers (Feder et al., 2020). Over the pandemic, numerous video technology solutions were introduced (Rose et al., 2020), most of which were not specifically designed for virtual ICU visiting. Solutions that require creating individual meeting links or reliance on staff personal devices or personal user accounts are not fit for purpose in terms of flexibility, ease of use, or privacy and data safety, and therefore should be avoided. Our group designed a bespoke virtual ICU visiting solution using aTouchAway™ https://tinyurl.com/4f8a5cun to overcome some of these barriers of existing video technology platforms. This solution includes a secure list of current ICU inpatients for whom family contacts are uniquely attributed (Fig. 1). This facilitates one-click video calling and security in the knowledge that the correct family member if being called. Poor camera positioning, lack of preparation of the family, and of the patient may also adversely influence the virtual ICU visit experience (Mistraletti et al., 2020). Training should be provided to all ICU staff on appropriate virtual visit preparation, conduct, and close out.

Opportunities promoted through virtual ICU visiting

Enabling opportunities for virtual ICU visiting as a routine option offered to families beyond the pandemic extends current concepts in open and flexible ICU visiting policy and addresses system-wide inequities in terms of access. Even without the challenges of access, the process of in-person ICU visiting is stressful (Schneeberger et al., 2020) with many families reporting feeling obliged to remain at the bedside for prolonged periods (Alonso-Rodríguez et al., 2020). Providing the added option of a virtual ICU visit can help to relieve some of these stressors.

Flexible ICU visiting options that include virtual visits help to humanise the ICU (Oczkowski et al., 2017) and reduce patient and

* Corresponding author.
E-mail address: Louise.rose@kcl.ac.uk (L. Rose).

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family distress (Rosa et al., 2019). From the patient's perspective, virtual visiting offers near-immediate access to 'see' family when experiencing extreme distress outside of typical visiting times e.g., at night. Virtual ICU visiting also offers patients the opportunity to virtually visit their own home, or those of family members, to see pets, children, or grandchildren further restoring social capital. The ability of virtual ICU visiting to take the patient home in this manner is an additional benefit that is not feasible with policies that include in-person visiting only.

Virtual ICU visiting can also facilitate family involvement in care delivery, recovery activities, and decision-making during rounds and family meetings when they are unable to be physically present in the ICU (Rodriguez-Ruiz et al., 2021). Research on virtual ICU visiting

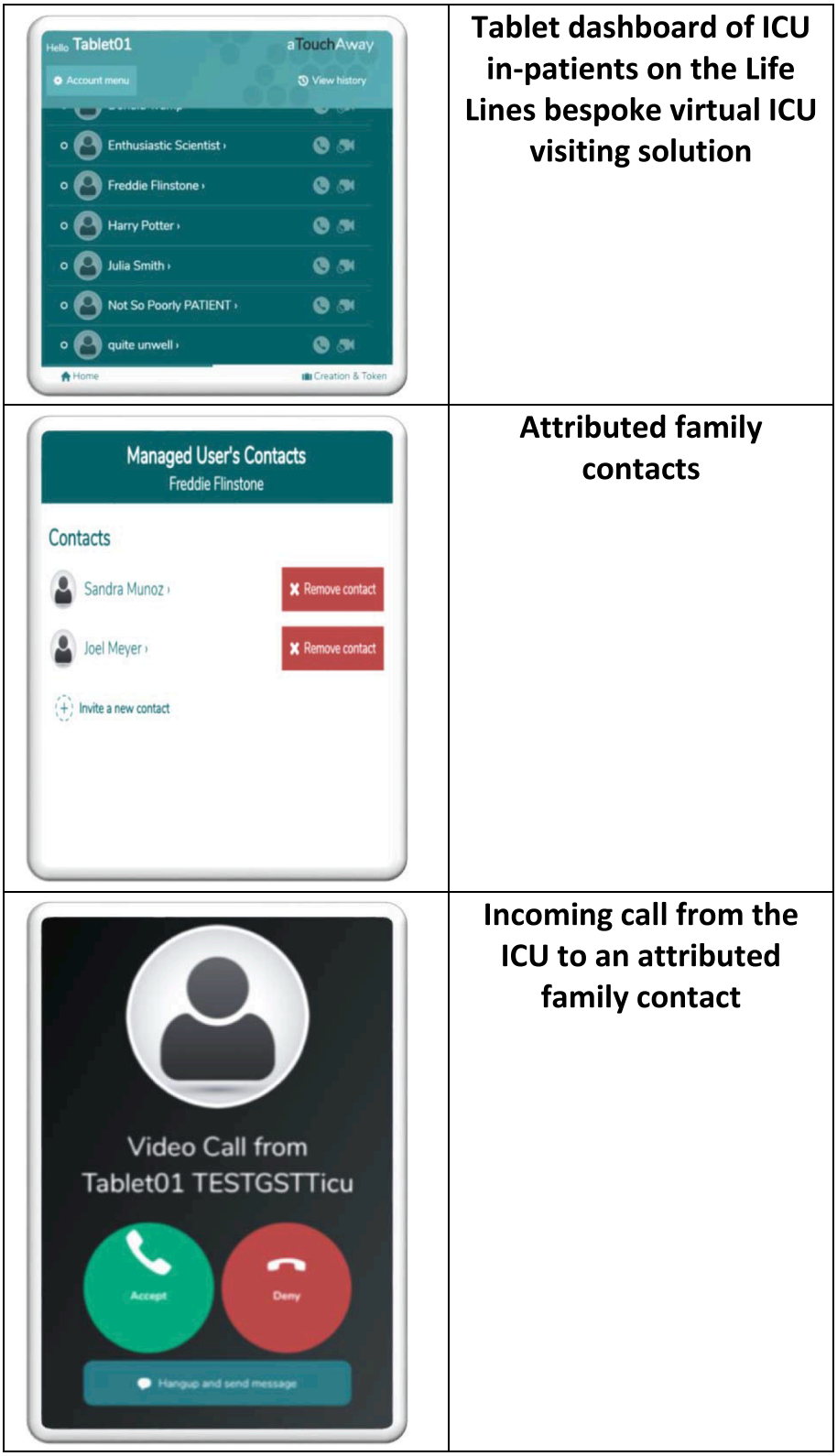

Fig. 1. Life Lines bespoke virtual ICU visiting solution.

conducted during the pandemic has identified opportunities such as involving family to provide motivation for physiotherapy, rehabilitation, and nutritional intake; facilitating communication for patients with hearing impairment or with a language barrier; and providing reorientation during delirium and calming during periods of agitation and distress (Rose et al., 2020).

Conclusion

The widespread introduction of virtual ICU visiting during the COVID-19 pandemic now offers us further opportunities to facilitate flexible family and significant other access to the ICU as well as offering our patients the opportunity to experience virtually going home. To further embed virtual visiting as routine family-centred ICU practice, either as a substitute or complement to in-person visiting, there is now a need for revision of non-pandemic ICU policies to incorporate virtual ICU visiting, education of staff about optimal visiting practices, and widespread availability of appropriate virtual visiting technology.

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