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Moving from non-emergency bleeps and long-range pagers to a hospital-wide, EHR-integrated secure messaging system: an implementer report

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ABSTRACT

Introduction Obsolete bleep/long-range pager equipment remains firmly embedded in the National Health Service (NHS).

Objective To introduce a secure, chart-integrated messaging system (Epic Secure Chat) in a large NHS tertiary referral centre to replace non-emergency bleeps/long-range pagers.

Methods The system was socialised in the months before go-live. Operational readiness was overseen by an implementation group with stakeholder engagement. Cutover was accompanied by a week of Secure Chat and bleeps running in parallel.

Results Engagement due to socialisation was high with usage stabilising approximately 3 months after go-live. Contact centre internal call activity fell significantly after go-live. No significant patient safety concerns were reported.

Discussion Uptake was excellent with substantial utilisation well before cutover indirectly supporting high levels of engagement. The majority of those who previously carried bleeps were content to use personal devices for messaging because of user convenience after reassurance about privacy.

Conclusion An integrated secure messaging system can replace non-emergency bleeps with beneficial impact on service.

INTRODUCTION

In 2019, the UK Health and Social Care Secretary announced that the National Health Service (NHS) should remove bleeps and pagers for non-emergency communication by the end of 2021.[1][2] While this technology is now in costly obsolescence and pilot studies have shown efficiency saving[3] using smartphone messaging, legacy equipment remains firmly embedded in the NHS. Optimal strategies for adoption have received little attention[4] and barriers to adoption have been identified.[5]

Cambridge University Hospitals (CUH) NHS Foundation Trust has used a comprehensive Electronic Health Record (EHR, Epic Systems Corporation, Verona, Wisconsin, USA) since 2014. An information-governance compliant messaging solution (Epic Secure Chat) allows for messaging from smartphones, tablets or from within the EHR itself (desktop). The system is fully integrated with the patient chart so that messages and all read/reply times become part of the patient record. Large-scale implementation of an EHR-integrated messaging system to replace non-emergency bleeps/long-range pagers in an NHS organisation has not been previously described.

Setting

CUH is a large, tertiary referral centre in the East of England. It offers a diverse range of services with over 1100 beds and approximately 16 000 staff. A significant EHR upgrade (from Epic 2017 to the November 2020 version) was undertaken during the implementation period bringing additional Secure Chat functionality. The implementation period also coincided with a major Wi-Fi infrastructure upgrade to give full coverage across the estate.

Our aim was to replace all bleeps/pagers apart from 'cardiac arrest', 'major trauma' and 'fire' with Secure Chat (online supplemental S1).

METHODS

Secure Chat was made available at our organisation in July 2021. A go-live date in early 2022 was initially chosen due to ongoing COVID-19 pandemic disruption and to leverage additional necessary Secure Chat functionality that would only become available after an Epic version upgrade planned for November 2021.

An implementation group with executive responsibility was formed with

representation from the hospital's divisional structure to oversee the project. Socialisation was achieved by a network of 'clinical champions' and through regular communications including trust bulletin items, face-to-face and online question and answer events as well as information on screensavers and posters and offering at-the-elbow support in clinical settings. An etiquette guide was published to define appropriate use of different methods of communication. Our safety surveillance is described in (online supplemental S5).

Contact centre (online supplemental S2) workload was a key concern at the time of cutover since any communications difficulties would likely result in a call to an agent for help. For safety a transition period where contact centre operatives would send messages both to Secure Chat and to existing bleeps for 1 week post go-live was planned. Secure Chat would not be available during (un)planned Epic outages for which the contingency was to fall back on an internal directory of alternative contacts securely maintained by the contact centre and this was widely publicised.

Secure Chat allows for various groups to enable team and role-based messaging. Because of system limitations at the time of the original implementation, our hospital had not fully implemented a sign-in system which we could leverage for automatic group creation. Instead, we created 'opt-in' groups to replicate existing roles, relying on staff to opt-in (out) at the beginning (end) of their duties (online supplemental S3).
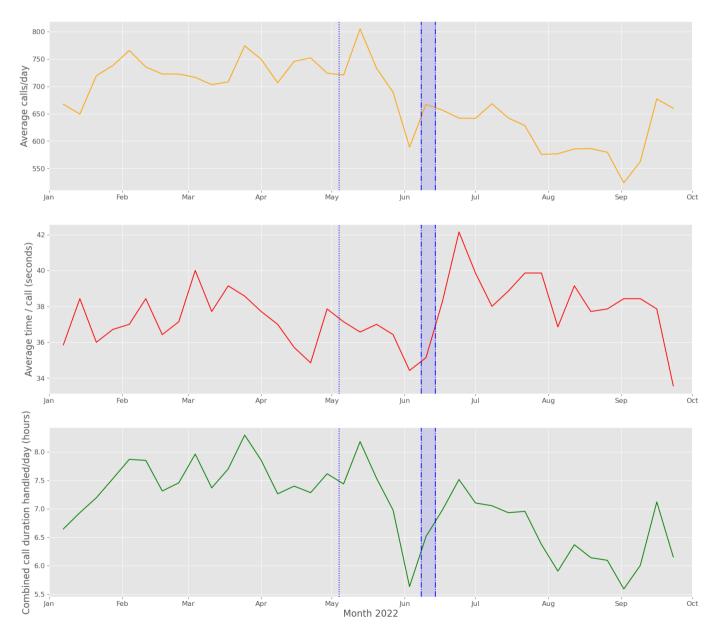

Figure 1 Uptake and organisational impact of Secure Chat implementation. Top panel: internal calls handled per day. Middle panel: average contact centre time spent per call (seconds) Bottom panel: total call time (hours). Dotted line represents date of delayed initial go-live. Data are averaged by week to remove fluctuations from weekends.

Mean comparison was with *t*-tests; structural breaks were examined using the Chow test. Statistical significance was taken at p<0.05.

RESULTS

Technical

Secure Chat access was enabled for all members of staff with an Epic login. Non-clinical users, (such as contact centre agents, were not given security to view patient charts). Users who would previously have used bleeps were strongly encouraged to use their own personal devices although mobile phones (or pool phones) were provided in a relatively small number of cases where staff did not have a suitable device or were unwilling.

Workflow

For the mobile app, onboarding involved installation of a CUH-specific profile and a website was set up for this. An initial manual batch activation step was subsequently automated using Blue Prism robotic process automation software (Blue Prism group, Warrington, UK) so that registrations could be completed day and night.

The creation of opt-in groups was a major undertaking and had to be done centrally as no reliable list of baton bleep roles existed. An initial list of some 220 groups was compiled from information from clinical champions and existing bleep lists. After some local user acceptance testing, these groups were made available in December 2021. Inevitably creation, editing and deletion of groups was necessary, and this needed to be done centrally: a review process was set up to ensure consistency.

Outcomes

Adoption through socialisation in the months before go-live across all staff groups was rapid (online supplemental figure S2,S3) across all staff groups with pharmacy (and pharmacy technicians) proving to be an unexpected early adopter. The original 4 May 2022 go-live date was pushed back at a final go/no-go meeting to 8 June 2022 due to isolated specialty-specific readiness concerns. Gross total messages sent plateaued at over 600 000 by 3 months after cutover. Opt-in group maintenance peaked before go-live (online supplemental figure S4) although a significant maintenance burden occurred after the original 4 May date.

Internal call data handled by contact centre operatives is shown in figure 1. The average number of internal calls handled by contact centre operatives fell from 720 to 614 per day (p<0.0001) after implementation. While average time/call increased marginally from 37 s to 38 s (p=0.014), the total call duration per day fell overall by nearly an hour from 7.4 hours to 6.5 hours per day (p<0.0001). There was evidence of significant structural breaks for call numbers and average call time, but not for overall call time (p=0.01, 0.0003 and 0.06 respectively).

No significant risk events attributable to the Secure Chat implementation were reported (online supplemental S5).

DISCUSSION

We demonstrate that secure messaging can be implemented in a tertiary NHS hospital without significant incident or negatively impacting on contact centre activity. This was possible even without physically retiring the legacy system: bleep counts dropped to negligible levels (online supplemental figure S3) which is important as multiple coexisting communication methods risk overload.[5]

It is anticipated that the bleep system will be decommissioned in due course depending on a future resilience analysis.

While a minority of staff expressed reservations before go-live citing privacy concerns we were able to provide assurances; most were ultimately content to use their personal devices which offered convenience advantages. The largest complaint received from users concerned inappropriate use of Secure Chat for non-urgent messaging. This is a known issue[3] but the etiquette guide which set out clear expectations was key central to empowering staff to challenge inappropriate messaging.

A number of short (1–2 hours) routine Epic upgrade outages have subsequently taken place (scheduled at weekends and night-time) during which time Secure Chat was not available. Concerns that the contact centre could be overwhelmed at these times have not materialised.

CONCLUSIONS

We were able to effectively replace non-emergency bleeps/long-range pagers with a messaging system integrated with the patient chart in a large NHS academic hospital by the soft approach of socialisation before cutover. Discounting the time before our EHR upgrade in November 2021, we were able to do this in 7 months with message numbers and support needs stabilising within approximately 3 months of go-live using existing infrastructure and without significant incident.

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