Safe Interorganizational Health Information Exchange During the COVID-19 Pandemic

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ABSTRACT

Accurate and timely transmission of medical records between skilled nursing facilities and acute care settings has been logistically problematic. Often people are sent to the hospital with a packet of paper records, which is easily misplaced. The COVID-19 pandemic has further magnified this problem by the possibility of viral transmission via fomites. To protect themselves, staff and providers were donning personal protective equipment to review paper records, which was time-consuming and wasteful.

We describe an innovative process developed by a team of hospital leadership, members of a local collaborative of skilled nursing facilities, and leadership of this collaborative group, to address this problem. Many possible solutions were suggested and reviewed. We describe the reasons for selecting our final document transfer process and how it was implemented. The critical success factors are also delineated. Other health systems and collaborative groups of skilled nursing facilities may benefit from implementing similar processes.

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In July 2017, our health system's accountable care organization established the Health Optimization for Elders (HOPE) Skilled Nursing Facility (SNF) Collaborative, which now includes 25 skilled nursing facilities from 7 surrounding counties. One focus of the collaborative is to improve care transitions, and the collaborative is currently working on safe transitions within the context of COVID-19. Electronic medical record systems are inconsistent across health care settings, and transferring patient data became even more complicated in the context of the COVID-19 pandemic. When patients arrived from SNFs to the hospitals, staff were donning personal protective equipment to review paper documents to avoid fomite transmission of COVID-19.[1] In addition to delaying care, this was burdensome and wasteful, considering the nationwide shortage of personal protective equipment.

HOPE leadership took this opportunity to both address the infection control need and to improve transitions of care between SNFs and hospitals. One factor long impacting continuity of care between settings is a lack of interoperable clinical information systems.[2] Too often paper documentation is misplaced in emergency departments, which were not designed to maintain paper records. Hospital care suffers when source documents including medication administration records, medical and nursing notes, and advance directives are not available to care providers who need to review it in detail. The ideal solution

would attain 2 goals: (1) transfer medical documents safely and efficiently to the hospital team and (2) integrate data into the medical record for all staff to review.

Solution-Seeking Process

HOPE leadership identified currently existing SNF processes that could be built on for the solution, to minimize the burden of navigating new software systems or workflows. Communication mechanisms between HOPE Collaborative SNFs and our hospital system in the pre-COVID-19 phase included a transfer center phone number where SNF personnel give verbal sign-out when sending a patient to the emergency department; a secure online document-sharing website; and an electronic health record (EHR) portal where SNF staff review inpatient medical records and upload documents to the patient's chart. Among other suggestions, use of the portal and file-sharing site was considered, but logistical issues precluded use of these mechanisms. HOPE leadership reached out to others in health system technology support, online portal management, and SNF leadership to draft possible solutions. The list of considered solutions is described in Table 1.

For several reasons, our accepted solution involved using software that would transform SNF fax input into data fully integrated into the EHR. First, fax is currently available at all local SNFs and did not require additional equipment, training, or security access. On the hospital end, health information management already used a secure fax to receive records, so no new infrastructure was needed. Second, it built on existing processes. Administration and compliance officers were familiar with the workflow in other settings, so approval was

Table 1
Proposed Medical Record Transfer Mechanisms

Proposed Solution	Pros	Cons
SNFs e-mail records to a secure group inbox	- Multiple clinicians can access - No new training needed	- Not all SNFs can send encrypted e-mails or create PDFs - Additional process needed to incorporate into EHR - Additional process needed to manage hospital user access to group inbox
SNFs fax records to a central number that scans and sends to a secure group inbox	- Multiple clinicians can access - SNFs comfortable with fax	- Additional process needed to incorporate into EHR - Possible record availability delay
SNFs upload records to a secure website	- Secure, encrypted - Website already available	- Burdensome to monitor and maintain site - Not all SNFs can create PDFs - SNF staff turnover necessitates frequent user access changes - Firewall issues - Additional process needed to incorporate into EHR
SNFs upload records to EHR via existing linked software	- Automatically integrates into EHR - HOPE Collaborative SNFs have access already	- Documents uploaded to a separate media tab in EHR; not fully integrated - Not all area SNFs have access; high administrative burden to obtain new access - SNF staff turnover necessitates frequent user access changes
File Transfer Protocol (a standard system to transfer files between a client and server)	- Secure	- Additional process needed to incorporate into EHR - New technology for SNFs and hospital clinicians - SNF staff turnover necessitates frequent user access changes - Uncertain data security
Commercially available care integration software—SNFs input electronically	- Health information exchange following common guidelines - Automatically integrates into EHR	- No local SNFs currently enrolled with program - Unclear what format documents are compiled into - Possible record availability delay
Commercially available medical record indexing solution—SNFs input by fax*	- Health information exchange following common guidelines - Automatically integrates into EHR - SNFs comfortable with fax	- Possible record availability delay

PDF, portable document format.
 *This option was selected by leadership.

expedited. The health system had a pre-existing contract with the data integration vendor, who waived initiation costs for new COVID-19–specific workflows. Third, the software integrated SNF data into appropriate areas of the EHR (eg, advance directives colocated with other advance care planning documents). Records needed to be easily accessible to inpatient providers, to reduce cognitive burden and facilitate clinical care.[3]

Implementation

After this process was approved by hospital leadership, the next step was introducing it to SNFs and hospital staff. A communication was sent to local SNFs via e-mail with instructions that included the fax number for each of our health system's hospitals, a list of important documents to send, and an updated 2-step workflow asking SNFs to first call the transfer line (part of their existing workflow) and then fax records. HOPE leadership created a flyer that could be posted at SNF nursing stations and promoted the process during monthly HOPE webinars and in educational e-mails. On the hospital end, educational tip sheets were created for hospitalists, case managers, pharmacists, and other team members. One-time e-mail communications were sent to hospital staff by hospital leadership.

On the first day this process was implemented, a COVID-positive patient was transferred from an SNF to the hospital. The SNF used
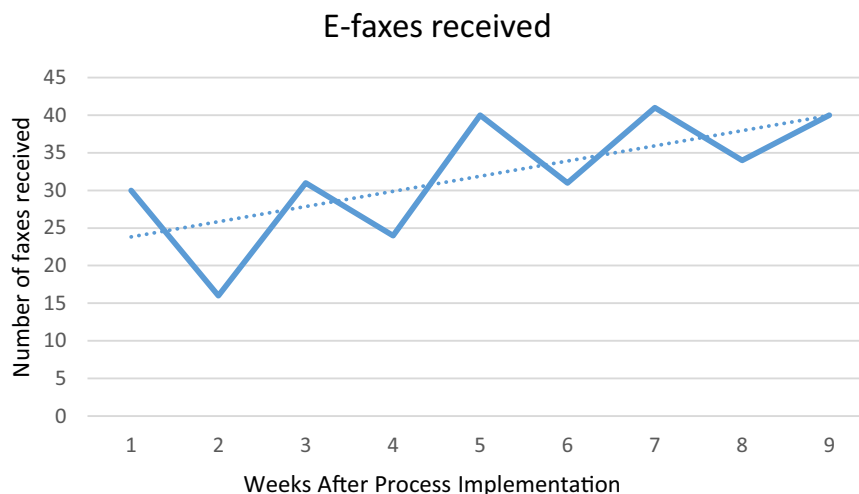
Fig. 1. In the 9 weeks since implementation, e-fax utilization has generally trended upward, suggesting successful education about the process and increasing consistency of usage. A downloadable PDF of this form is available at www.sciencedirect.com.

Table 2
Critical Keys to Success

1. Strong partnership between SNF and hospital
2. Technology widely available at all SNFs
3. Low burden for users
   a. No new technical training
   b. No special access
   c. Minimal changes in workflow
4. Timely
5. Secure
6. Similar to other previously approved processes
7. Early support from important stakeholders
8. Sustainable

this process successfully, with documents integrated in the EHR in approximately 1 hour.

Evaluation

In the 9 weeks since implementation, the process has been used 287 times throughout our 3-hospital health system, with overall increasing usage as shown in Figure 1. Week 1 usage was high in part because of receipt of requested records for patients already admitted; all other data points were spontaneous file transfers from SNFs to the hospital. There were weekly fluctuations in usage. This may be due in part to fluctuations in hospital transfers related to COVID-19 over the same time frame, as well as normal variation in SNF to hospital transfers for other acute problems. Timing of education and outreach promoting the e-fax process did not directly correlate with timing of increased usage. The overall increasing trend with education and time suggests that consistency in use is improving.

The only new cost incurred was the price per document for each incoming fax, to achieve the 1-hour turnaround time.

Comment

Collaborative models between academic hospital systems and local SNFs have demonstrated improved relationships and continuity of care supporting quality patient care during the COVID-19 pandemic.[4] HOPE Collaborative leadership was able to take action quickly since the beginning of the pandemic because of our strong relationships with SNFs and an established leadership team. We were familiar with the unique challenges that exist in SNFs, including frequent staff turnover, limited technological resources, and dealing with the processes of multiple hospitals and health systems,[5] and Collaborative

SNFs trusted us to provide quality education, communication, and assistance. Other health systems without these building blocks may have a slower response in order to build relationships, understand processes, and identify team members.[6] From the first brainstorming session to day 1 of implementation, this process took less than 2 weeks. To date, it has been in use for 9 weeks, and feedback from SNFs and hospital teams has been positive. Two issues were identified during implementation: on a few occasions, only 1 side of a 2-sided document was received; on another occasion, there was a data integration delay of more than an hour. These have been resolved with education and troubleshooting. One limitation is that our hospital system was not previously tracking patient admission source information (ie, whether they came from home, congregate living, etc) and so we are unable to accurately tell what percentage of patients admitted from SNFs are using the e-fax process. We have since updated EHR documentation to capture and track that data moving forward. A summary of key implementation factors is described in Table 2; without these, attempts at improving interoperability of health information exchange have been less successful.[7]

Our relationship with collaborative members helped us quickly identify the logistical challenges facing SNFs with each of the suggested solutions, and advocate for a process that would be feasible and efficient. The new workflow, borne out of necessity developed during the COVID-19 crisis, is a critical improvement over the previous process, which will continue to be used after the pandemic has concluded.

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