Turning Old Technology into New Systems

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by Ellen Miller Anderson, RHIA

The need for updated technology rarely coincides with enough funds to purchase it. However, disparate technologies can be combined to meet information system needs without a major capital outlay. At Home Care Services, part of Group Health Cooperative (GHC) in Seattle, we created the On Call Patient Profile system out of current systems using very little money.

Nights, Weekends, and Ever-changing Data

GHC is a regional health maintenance organization serving a tenth of Washington state residents. Home Care Services is a care delivery unit within the system and On Call Services (OCS), developed by Home Care Services, dramatically aids in the continuum of care. OCS nurses work nights and weekends responding to the urgent care needs of identified homebound patients receiving hospice, home health, child care, and home infusion services. The nighttime clinicians generally work out of their homes and do not have access to patient's paper medical records, while the weekend clinicians usually work from a Home Care Services office.

Approximately 70 changes occur each week among these seriously ill or fragile patients. As a result, communication between care providers is crucial. All interdisciplinary team members could interact with the patient during weekdays, generating multiple views of the patient's status. Ever-changing patient data-in the form of hand-transcribed voice mail messages, sticky notes, loose papers, individual notebooks kept by some OCS clinicians, and more-created a jungle of paper. Office staff would update weekly the official, 15-pound, three-ring binder of data, then pass it on to the clinicians as they began their multi-day coverage. The individual staff member was expected to follow approximately 150 OCS patients.

With no capital and an urgent need to place crucial, accurate, and up-to-date patient information in the hands of these care providers, the information services department (ISD) partnered with Home Care Services to create a solution-the On Call Patient Profile (OCPP)-with available materials and resources.

The OCPP project had relatively simple goals. We set out to increase the OCS staff coordination and quality of patient care through timely access to changing but accurate clinical information. We hoped to increase patient care time by decreasing time spent gathering clinical data needed to deliver that care. From an IT perspective, we planned to identify the practicality of nurses using laptop computers, including a regular, large modem file transfer to private homes scattered across our geographical service area, and to apply all learning to future laptop implementations.

Uniting the Available Technology

When a patient was referred to Home Care Services, a referral assistant entered the patient data into the old information system. The ISD wrote utility programs to identify those patients to populate the OCPP system, extract this data from the patient master file, avoid duplication of records, translate the information, and transfer the file to a PC by batch mode or on demand. Another utility program was built to import the files to the OCPP system on the server database. This created the initial data that the staff needed to begin care delivery. Verification reports were developed to validate all transaction completion.

The organization's voice mail system played a huge role in updating patient data. Our voice technology experts found capacity on the voice mail system that had been originally designated for another area but never used. With that, the OCS manager and the voice technology experts wrote a complex, but clinically logical, structured call flow. The flow followed this hierarchy: admits, updates, and discharges mail boxes were found under the main hospice, home health, and IV phone lines. The IV line had an additional mail box to handle those patients already in OCS who were adding IV therapy to their existing care.

OCS also provided written recording procedures, voice mail scripts with ordered questions for every type of defined call, and good user reference guides.

Clinical staff in all Home Care Services programs were trained to use this voice mail capacity so they could report an admit, update, or discharge to the OCS staff at any time. Sharing updated clinical data with the night and weekend OCS staff dramatically aided the continuum of care in this staff model. Trained referral assistants had unique access to the "answer boxes" to pull data and transcribe directly into OCPP. The order of the answers in the voice mailboxes was determined by the navigational flow of the entry screens in OCPP, easing the entry process. Thus, all entry data into OCPP system physically flowed through utility programs or voice mail messaging.

Getting the Data Out to Clinicians

Our highest risk, and greatest challenge, lay in getting the data out to the remote clinicians. The enterprise-wide remote access pilot was based on remote node architecture, a methodology for creating identical computer operations for both PCs and laptops used for remote access. A routed network performed the needed messaging protocol conversion so that the operations of the remote laptop device would be identical to a normal LAN PC device, the remote version of OCPP would suffer no degradation, and the departmental version could be serviced via a file server.

Covering a large geographic service area, we faced a variety of public switched telephone networks. Further, there were limited physical access ports available. OCS staff was competing with about 50 other GHC care providers to use the same remote access pilot program to access functionality they had in their office environment. Physical connectivity and outbound-only file transfers could fail at the drop of a phone connection or a variety of other glitches, causing the OCS staff to repeat the process while needing refreshed data to begin their shift.

Our technology assessment group championed the technical infrastructure for the pilot program, provided the necessary access cards and access equipment, trained staff, helped write the remote access chapter of our user manual, and provided continual support through implementation-all at minimal cost to the project team.

Clinicians ultimately reached a comfort level with the whole remote access process and outbound file transfer, but not without significant frustration. As an incentive, we implemented remote access to their e-mail at the same time. Future plans called for remote access servers to ease the protocol conversion. The pilot program set out to validate that investment. It was clear that a remote access server layer would ease everyone's burden. This was installed later, and delivering care via remote laptop computer is now a daily part of our organization's life.

The laptops were mostly trouble-free. The only general challenge turned out to be the "removable" modem cards that caused variability in the handshake between the router network and the laptop computer. Several versions were used before we found stability and consistency. From an IT support perspective, we learned that we needed to assign laptops to individual clinicians, because some clinicians re-formatted the "shared" laptops. This frustrated other OCS staff using the same computer during the next shift. We also standardized how we configured each laptop so the help desk could easily assist the clinician in need in the middle of the night.

New and Old Lessons

Creating and implementing the OCPP yielded many lessons. If we had to do it all again, we would approach the clinician with remote access hardware with better technical infrastructure when both remote access and remote hardware usage advanced to an enterprise scale. We had to train the support community to be careful about initially misdiagnosing a bad hardware defect as just a "user error." Further, we learned a lot about modems, which served us well when we later purchased a number of laptops for clinician usage.

Data entry proved to be problematic. The OCS staff wanted to enter their own data, not use the voice mail system to accomplish this. In the OCPP, they were limited to looking at data only, not entering it, due to the nature of the remote access pilot. The referral assistants had varying degrees of medical language skills and errors added to the OCS staff frustration. The lesson: get entry done once and initially by the generating source. This is not a new lesson, to be sure.

The voice mail messaging system initially proved to be cumbersome to the clinical staffs. The OCS director worked hard to perfect the messaging process. Ultimately, the technology worked well for its purpose. By the late 1990s, we incorporated the OCPP functionality into a modern home health and hospice information system by configuring the existing product and by building some creative "work arounds" to capture, store, and utilize some unique data to the OCS world. This gave us true data integration for all Home Care Services' programs, including OCS.

We also found that integration between IT development and support staff must be stronger between when putting clinical information in the hands of night and weekend clinicians who rely 100 percent on data availability to function in their jobs. It gave new meaning to the concept of 24-hour, seven-day-a-week support, and we continue to struggle with this staffing issue today as we add more clinical workflow integration to our information systems. Overall, the greatest lesson we learned was with enough motivation, an organization can build a creative system solution to an urgent business need out of almost nothing.

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