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Case Study: Workflow Analysis for an Ambulatory Electronic Medical Record

Executive Summary

Large integrated delivery networks struggling to automate ambulatory care should visit the rocky coast of Maine to glimpse the horizon of patient-centered care. Central Maine Healthcare, a medium-sized provider based in Lewiston, successfully launched a process-redesign strategy that has provided the foundation for installation of an electronic ambulatory patient record from Hillsboro, Ore.-based MedicaLogic.

"Our goal was the patient-focused visit and improved customer service. We wanted to take the patient off the conveyor belt—have staff go to them rather than sending the patient from staff to staff," says Joyce Bedor, project redesign manager. The redesign team asked what tools the staff needed to accomplish this goal and how an electronic medical record (EMR) would affect it. "We didn't reduce any staff with the EMR, but our goals were to improve customer service, improve clinical outcomes and provide a tool for better clinical documentation," she says. Focusing on the customer helped determine the workflows to be documented.

Central Maine's from-the-ground-up workflow analysis has enabled the organization to install its ambulatory system with few, if any, glitches while achieving acceptance from providers and staff—to the point that affiliated physicians not slated to receive the system are requesting it. The organization took just four months—from January 1998 to April 1998—to do the initial process analysis and redesign, starting with the pediatric department. It is following up with installation of the EMR one clinic at a time.

Central Maine Healthcare Corporation (CMHC) is an integrated healthcare delivery network that serves the residents and people who visit Central Maine. CMHC is composed of three hospitals including Central Maine Medical Center, Rumford Community Hospital and Northern Cumberland Memorial Hospital. CMHC includes a Family Practice Residency program and three physician groups: Central Maine Clinical Associates located in Lewiston, Northern Cumberland Physicians Group in Bridgeton, and Swift River Medical Center in Rumford. CMHC owns 50% of the Central Maine Partners Health Plan and is the prime sponsor of the Central and Western Maine PHO which is composed of 4 hospitals and over 250 physicians.

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Do you know where your chart is?

A cross-sectional implementation team—representing pediatrics, OB-GYN, family practice, the IS department, a practice manager and other staff—analyzed every process ranging from patient telephone calls requesting appointments to actual office visits and prescription refills. The results were sometimes astounding. An analysis of the process of finding patient charts in internal medicine, for example, determined they could end up in no less than 41 different places. Perhaps this is not so surprising, given the fact 11 providers, 11 nurses, a practice manager, plus laboratory, medical records and dictation staff all handle patient charts.

An analysis of the process of finding patient charts in internal medicine, for example, determined they could end up in 41 different places.

After painstakingly defining existing processes (see Table 1), the team displayed them in flow charts (See Chart 1) for easier evaluation. They questioned whether a particular process was performed in a certain way because it was manual or for a reason inherent to the task itself; how would use of an electronic medical record (EMR) change the process, if at all? In the case of a second patient telephone call, for example, the team questioned why there may not have been enough information provided in the first phone call, and if an EMR would make the second unnecessary.

TABLE 1

Steps in process reengineering

The first step toward reengineering is to document and understand the current processes, best accomplished by interviewing staff and providers and developing flow charts. The following is a list of key questions to ask in the gathering of this information:

- What are the key processes?
- Who performs them?
- When are they done?
- Why are they done in a particular way?
- Where are they done?

Source: Central Maine Healthcare

Going with the flow

Setting the stage for Central Maine's initiative: a hospital-based reengineering effort three years ago, with the assistance of First Consulting Group, introduced management to a process-redesign skill set of flow-charting, interviewing and time-and-motion studies. This time around, the redesign team also referenced the book "Reengineering the Medical Practice" (St. Andrews Publishing, 1996) by Jon Hultman, M.D.

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Joyce Bedor,
redesign project manager

However, the earlier effort focused on the in-patient setting, in which the physician is one player—albeit an important one—in a swirl of players. The psychology of the ambulatory setting was quite different.

"Providers in the ambulatory setting think they do all the best processes, says Joyce Bedor, project manager of the process redesign effort. "Until you point out how many times they walk in and out of their offices, they won't believe you," she says.

Also, the earlier initiative aimed at reducing expenses, while the new strategy had a different vision in mind.

No broken systems allowed

"We approached this differently," says Bedor. "We were going to automate systems and we didn't want to automate broken systems," she says. Perhaps the most significant change in the new redesign was a shift in emphasis to the patient.

"Our goal was the patient-focused visit and improved customer service. We wanted to take the patient off the conveyor belt—have staff go to them rather than sending the patient from staff to staff," says Bedor. The team asked what tools the staff needed to accomplish this goal and how an EMR would affect it. "We didn't reduce any staff with the EMR, but our goals were to improve customer service, improve clinical outcomes and provide a tool for better clinical documentation," she says. Focusing on the customer helped determine the workflows to be documented. (See Table 2.)

Ubiquitous, simultaneous access was a big driver for EMR development.

TABLE 2

Workflows to be Documented for an Ambulatory EMR

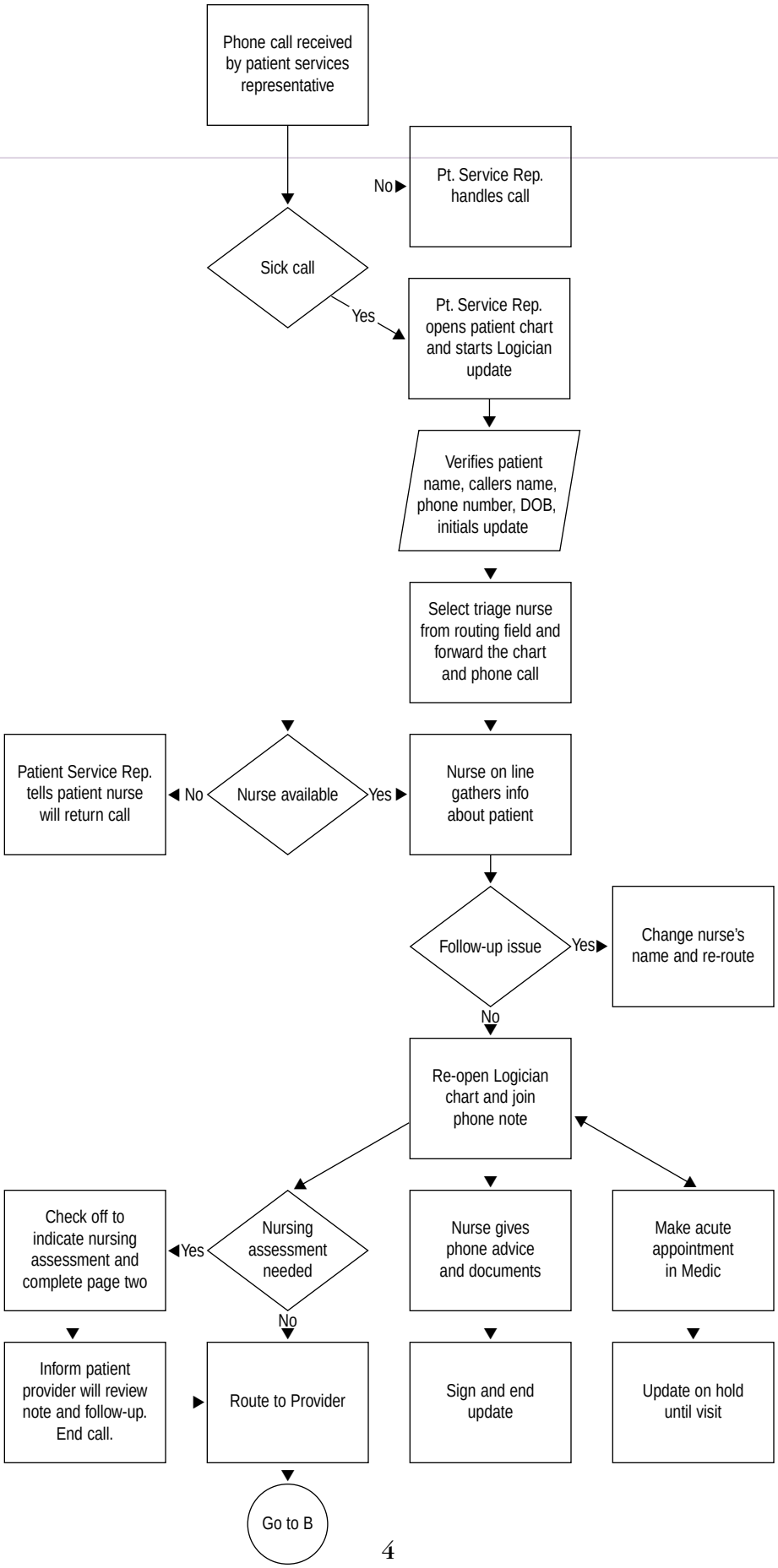
- Request for medical information
- Telephone message for medical care
- Medication refills
- Referrals
- Office visit for an established patient
- Nurse-only visit
- Walk-in office visit
- New patient visit

Source: Central Maine Healthcare

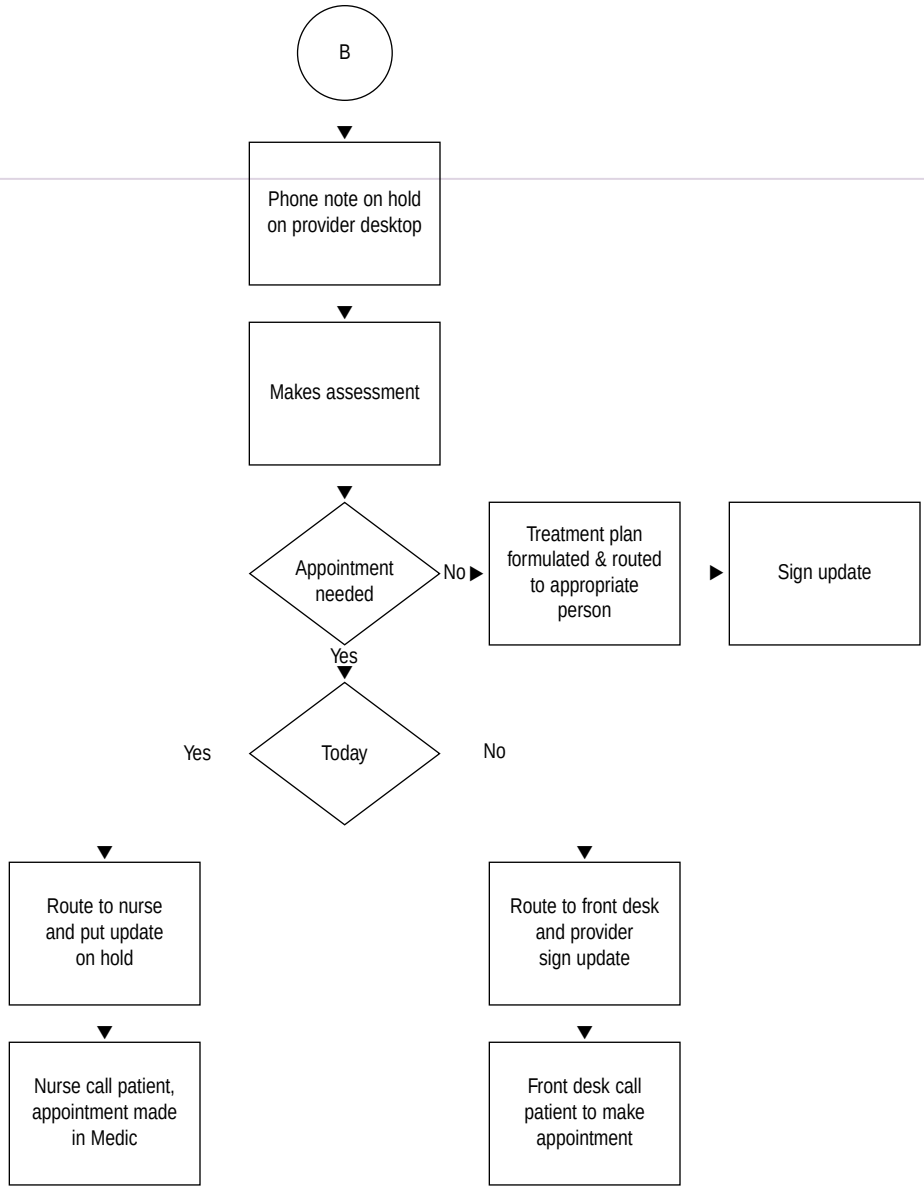
So far, the results are dramatic. The turnaround time for filling a prescription drug request, for example, was cut to just minutes from a previous eight hours. (Indeed, the organization had advertised a 24-hour turnaround time in getting a prescription filled in its brochures.) The old process involved calling in prescriptions at lunch and at the end of the day, prompting a string of numerous other tasks including having a nurse look up the patient's chart and contact the physician. In the meantime, the patient had to interact with several people all of whom asked the same questions.

Now when a patient calls, a nurse can immediately check the EMR on a computer, which displays a concisely organized chart of all the patient's medications with a checklist of protocols to meet. Doctors have access to the same information. Ubiquitous, simultaneous access was a big driver for EMR development. "Often two or three people need the patient chart at the same time," says Bedor.

CHART 1 – **Triage Phone Call Workflow**



Triage Phone Call Workflow



No holds bar-coded

In the past, if a patient needed a referral to a gastrointestinal specialist, the patient's paper chart was given to the nurse to relay information to the specialist. If it happened the GI's office was closed, the chart could easily be reclaimed by the provider to complete the visit documentation. This could result in the chart never making its way back to the referral nurse and the GI visit never getting scheduled. The use of bar codes to track medical records was attempted but failed completely if one person forgot to "wand" the document in or out of a location, a common occurrence with so many people handling the record.

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"Until you do process analysis, you never realize how many people touch the chart, especially in internal medicine," says Bedor. Such workflow analysis can reap multiple benefits. (See Table 3)

TABLE 3

Opportunities for Change

The second step in reengineering is to analyze current workflows to determine which can be more efficient or customer-focused. The analysis should identify which tasks are the most difficult, most repetitious and/or most time-consuming. An error-rate analysis should also be considered. This analysis will help prioritize which processes to reengineer. Opportunities for change may be found in the following areas:

- Eliminating bureaucracy (empowering and cross-training employees)
- Reducing cycle time (eliminating bottlenecks and wasted activities)
- Eliminating activities that add no value from the customer's perspective
- Reducing interruptions
- Eliminating duplications
- Converting series to parallel activities
- Standardizing tasks
- Reducing process time
- Reducing task variances

Source: Central Maine Healthcare

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Tools that enhance the effectiveness of the EMR

One of the keys to making the ambulatory EMR work, according to Bedor, is placing end-user devices—wireless laptops, desktops PCs—in any location that requires chart documentation. It is important to use the departmental office visit workflows to determine the type and location of devices. For example, in the pediatrics clinic, the providers wanted to make sure they maintained a triangle between the caregiver, the patient and the provider. They also needed to buy equipment that would withstand handling by the children. The team determined that a Planar wall-mounted, flat-panel computer in every exam room would fit the pediatric model. OB-GYN, on the other hand, received Fujitsu handheld, wireless devices for providers who did most chart documentation in the hallway outside the exam room.

The handheld devices are similar to ones used to record inventory data in warehouses and register rental-car returns at airports. Bedor and her staff designed data-input forms that enable the OB-GYN providers to document without the use of a keyboard.

After pediatrics and OB-GYN, which come online in March, Bedor and her team will focus on family practice residency, documenting work processes on paper, changing them and tweaking them. Then the group will introduce the MedicaLogic product into the workflow and determine its impact. That's when unnecessary steps are eliminated. The analysis is iterative, meaning that it evolves as the group continuously evaluates it over time. "Sometimes we find that we did a task a certain way just because we'd done it that way for 100 years," she says.

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A living, breathing thing

The implementation team used the workflow charts to train staff in using the new EMR and, after a two-week trial that allowed for adjustment, sat down with the staff to find out what worked and what didn't in the new processes. "It's a living, breathing thing," says Bedor of the workflow. But staff buy-in was assured from the project's outset. Team members were charged with keeping their respective staff constituencies updated on the status of the redesign and how it would affect them. A special "Logician Team"—whose job it is to install the Logician EMR product from MedicaLogic—attended all the meetings of the redesign team.

That end-user involvement wasn't a part of the earlier hospital-reengineering effort, and Bedor cautions that such participation, although critical, isn't easy. "It's a big time commitment. We pulled people away from their desks for two hours, once a week," she says. The job isn't complete once the clinic goes "live," it may be necessary to regroup and make sure the redesigned processes really work.

That commitment may become routine. Central Maine expects to extend the EMR to non-owned but affiliated physicians who have asked to be linked to the new system. The organization is also implementing an enterprise-wide scheduling system which, combined with the ongoing EMR initiative, will take another two years.

Conclusions and recommendations

As this case study illustrates, having a clear focus, utilizing a cross-sectional team and taking the time up-front to analyze existing workflows can yield significant benefits during and after an implementation of a new information tool. Each organization is unique and must take into account its environment and those factors making it unique, yet some lessons learned from the Central Maine Healthcare case study are applicable to any organization:

- With a clear business goal, at Central Maine Healthcare it was patient-centered care and customer service, the implementation team was

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able to design the new workflows to focus on patient-centered care and customer service. The EMR was built to meet that business goal.

- By involving those who would be impacted by the new EMR on the workflow analysis team, Central Maine Healthcare was able to obtain buy-in, thereby easing acceptance of the EMR. In addition, the workflow analysis incorporated the different perspectives of the users/team members, and thereby readily identified key processes and those who were involved in those processes.
- While time consuming and difficult to execute a workflow analysis, it enables all those affected by a new process to understand how and why the existing processes functioned the way they did, what impact they had on meeting the business goal and how the new system would change those relationships. Workflow analysis also highlights existing inefficiencies and enables the team to eliminate many redundant or non-value-added tasks.
- Taking the time to perform a detailed workflow analysis and build flowcharts up-front can lessen the implementation process and associated confusion, especially when the staff has trained using these materials. These tools can facilitate the staff's understanding of the changes triggered by implementing an EMR.
- Having detailed flowcharts of the new workflows also facilitates identifying what works and what does not after the implementation. The staff can point to areas where processes can be streamlined or re-designed for greater efficiency. Thus, the work processes can be continually enhanced.

Having a clear business goal, understanding existing processes in detail, and designing new processes to take advantage of the capabilities of the EMR to meet that goal enabled Central Maine Healthcare to implement a complex information tool with few, if any, glitches. It facilitated identification of key processes, and it spurred rapid acceptance of the new system. While difficult to execute, it ultimately paid off handsomely for Central Maine Healthcare as it would for other healthcare organizations.