case study

Bozeman Deaconess Hospital

Improving Patient Care with DocuWare

By utilizing DocuWare, Bozeman Deaconess Hospital has saved $20,000 a month! Patient care has improved significantly and wait times have been reduced because information is readily available to both patients and staff. DocuWare is being used to manage outpatient lab records across a multi-site environment, collect payments from insurance companies faster as well as store radiology scripts, insurance cards and signed release forms.

Bozeman Deaconess Hospital's primary objective is providing quality healthcare to individuals and their families. The hospital is an 86-bed, full service, not-for-profit hospital located in Bozeman, Montana, serving 85,000 people in a 90 mile radius and drawing additional patients from surrounding counties.

As the medical needs of the community grew, the hospital expanded its services to allow patients to have lab work done in any one of three locations. The pressing need for a better way to manage patient records and laboratory results across a multi-site system caused the hospital to investigate implementing an electronic document management system not only for the laboratory but for other areas of the hospital as well.

Document Situation and Work Process in the Lab

Originally, patients needing lab work went to the Outpatient Laboratory during the day and the main hospital Laboratory during the evenings and on weekends. A rolling file folder cart, which stored the paper lab orders, was wheeled back and forth between the two locations. Most of the time when a patient came to the Lab for a test, they brought a written lab order from their doctor with them. If they did not have a written order with them, it meant that the physician had either called or faxed the lab order in earlier that day or that the patient was at the Lab for a standing lab order (a test done according to schedule for a set time). The staff would first have to check the rolling file for one-time lab orders and then check the Rolodex, where standing orders were tracked.

If the patient was at the Lab for a standing order the staff member would note the time and name of the test on the Rolodex, then someone would have to call the other lab so they could update their Rolodex. When a one-time lab order was completed the actual order was clipped to other paperwork from the visit and then sent to the Lab Medical Records Department for filing.

When the hospital opened a third outpatient lab across town, they knew their existing paper-based system would no longer work. They had decided to make all of their records digital, but for a short time they were forced to maintain "identical" paper filing systems. During this phase the Lab staff would spend 5-10 minutes per patient calling and faxing the other locations to track down one-time lab orders and verify standing lab order schedules. Between all three locations, the Lab tests 250 patients per day and the time spent tracking down information amounted to upwards of 20 man-hours a day. Maintaining the "identical" systems required constant back and forth communication and was frustrating to the patients and staff alike.

Completed lab orders were kept on file for two years. If the Lab needed to look up an old order, someone would have to go downstairs, find the record, copy it and then re-file the original. One of the other problems with the Lab's paper based filing system was that previously pulled lab records often did not get re-filed correctly. Accessing an old lab record took a minimum of 30 minutes and it is estimated that the Lab staff spent four hours a week just looking for old lab orders.

Document Situation and Work Processes in the Radiology Department

The Radiology Department was also struggling with the same problem as the Lab - how to temporarily store orders, in this case scripts, until the patient arrived, the procedure was completed, and the information sent to the hospital's Medical Records Department. Before DocuWare, the Radiology Department stored their scripts in a huge box divided into nine sub-departments. The scripts were placed in the appropriate section and filed alphabetically by patient name.

Because the Radiology Department sees hundreds of patients per day, in total the staff spent 6 hours a day looking for scripts in an enormous box capable of holding 5,000 scripts. Time and again the scripts were out of order or lost and patients would have to wait while a new script was obtained from their doctor.

The majority of the scripts are picked up by the department's courier, who stops by the physician offices located on the medical campus surrounding the hospital. The remaining scripts are faxed or brought in by the patient.

IT Situation

The hospital has 300 workstations and 11 servers running Windows 2000. The four person IT Department also maintains a dozen different programs including the hospital's main software, Meditech.

Solution Requirements

Initially the hospital's main objective for implementing a document management program was to find a system that would address the Lab's problem of how to successfully manage a temporary repository of lab orders across multiple sites until the information was accessed, processed and filed into a permanent record. They did not want to implement a completely new system that would dramatically change their entire way of processing information. Their secondary objective was to make document retrieval easy, accurate, fast and convenient.

As early as the initial planning stages, other departments in Bozeman Deaconess Hospital realized they too would need access to the lab orders. The solution requirements soon expanded to allow the staff in Outpatient Surgery, Pre-Surgery and the Internal Medicine Lab to also have access to the lab orders. The Radiology Department planned to use DocuWare to manage their "lab orders" or scripts and the Admitting and Billing Offices saw the benefit of using DocuWare to streamline some of their business processes.

Lab Department Solution

Bozeman's DocuWare solution was implemented in January 2003 and the system is expanding rapidly throughout the hospital. In total, the hospital made a capital investment in 12 Fujitsu scanners, and eight Canon copier/scanners. The Canon machines replaced printers, fax machines and copiers with one piece of equipment. A DocuWare System License along with the DocuWare INTERNET-SERVER, ACTIVE IMPORT, AUTOINDEX, CDMAKER, ISIS PRO, and RECOGNITION modules made up the solution. The hospital has 25 FULL FUNCTION licenses with 41 additional

users accessing DocuWare through READ-ONLY licenses or over the Web using the DocuWare INTERNET-SERVER module.

Authorized DocuWare Partner, J & H Office Equipment, set up a lab orders electronic file cabinet to store scanned standing lab orders and the one-time order received directly from a physician. About half of the one-time orders are brought in by the patient and do not need to be stored in the temporary repository. A second cabinet, Lab Medical Records, was set up to store completed lab orders and the accompanying registration information. Patients register with the Lab each time they have a test done. The Lab Registrars print out various forms for the patient to sign, as well as a Lab Admissions cover sheet that contains that patient's information and a barcode unique for each visit. Each time a test is done the original lab order or a printout of the standing lab order is sent with the signed lab admissions paper work to be scanned into DocuWare and stored as a visit record. Every two hours the hospital's main computer sends a text file to DocuWare that contains new patient admission information. The DocuWare ACTIVE IMPORT module scans the text file and uses the information to automatically populate the index fields. The RECOGNITON module is used to read the barcode and populate the VISIT ID NUMBER field. Instead of using a Rolodex to visually see what standing order tests have been done over time, the staff uses a custom application which is seamlessly integrated within DocuWare.

J & H Office Equipment developed a custom standing orders Visual Basic application using the DocuWare TOOLKIT. The application looks like a DocuWare

menu and contains three tabs. The first tab lists all the standing orders in the system. The second shows all the standing orders for a particular patient. The standing order lab tests are viewed in a spreadsheet format that lists every test, line by line, and the date it was performed, providing the staff with quick access to a visual account of a patient's standing order test history. The third tab lists new standing orders that have been scanned, but still need to be entered into a spreadsheet. The standing orders are manually entered into the spreadsheet, because multiple orders are usually written on the same piece of paper. The custom application references the original standing order and eliminates the need to scan the paper lab order multiple times for each test on the order.

Radiology Department Solution

In the Radiology Department, the staff now spends only two hours a day scanning and manual indexing the handwritten documents they receive from their courier. Now, when a patient comes in the script is quickly accessed and the status index field is changed to ATTENDED once the test has been done.

The Solution Expanded to the Admitting and Billing Offices

The hospital's main Admitting Office uses DocuWare to store signed copies of various legal release forms. To simplify indexing, a face sheet that contains all of the patient information plus a barcode patient account number and visit number is printed and scanned together with the signed forms. DocuWare RECOGNITION and AUTOINDEX modules read the face sheet and automatically index the forms.

The Admitting Office also uses DocuWare to store and access patient insurance cards. Before implementing Docu-

Ware, a photocopy of the card was stored in a paper filing system in the Admitting Office. Today, they just scan the card and manage the information through DocuWare. Working with a digital image of the card has allowed the office to easily provide the information to Outpatient Surgery, the Emergency Room, Lab, Internal Medicine Lab and the Business Office.

"We can tie patient account numbers to the image of the insurance card. So if one of our Billing Representatives needs to see a card, finding it is easy," said Steve Scharmann, Business Office Manager at Bozeman Deaconess Hospital.

The Billing Department uses DocuWare to store Explanation of Benefits or EOB forms that accompany payments from insurance companies. Before DocuWare, the paper EOB forms were filed in batches. Each of the 11 billing reps accessed the EOB forms several times a day, meaning they would have to look through a 300 page batch in order to find information on a particular patient, a process which took upwards of ten minutes per request.

Today, the EOB forms are indexed by batch number and posting date. DocuWare's full-text search capabilities allow the information to be accessed any way, such as by patient name or procedure. Presently, 30 people in the Billing Office use DocuWare.

The Internal Medicine Lab also uses DocuWare to manage their own lab records and the Outpatient Surgery and Pre-Surgery staff have gained instant access to insurance cards and lab orders. This allows the Surgery Coordinators to easily see if all pre-surgery tests have been completed and what the insurance coverage will be.

The Benefits in Detail

Patient and User Benefits
The benefits of DocuWare extend from the patient and user level to the department level to the hospital level. Through the integration of DocuWare and the hospital's main computer system, patients are admitted to the hospital, Radiology and the Lab much quicker, improving patient care and satisfaction. Today, Bozeman Deaconess Hospital has

four labs, increasing their patients' healthcare options because the same information is quickly and easily available at each location. The hospital's Surgery Coordinators have improved access to insurance information and pre-surgery lab tests, providing patients with one point-of-contact to answer general pre-surgery questions. The access to information is so good that patient billing questions can be answered almost immediately because EOB information is available from the desktop - additionally, the solutions in Radiology, Admitting, and the Lab all result in instant access to needed information.

Department Benefits

The hospital's DocuWare solution went beyond the Lab's objective of creating a temporary electronic repository of lab orders able to be accessed from multiple sites. Today, DocuWare provides quick, reliable access to crucial information, such as the complete history of a patient's visit, including the lab admittance paper work and the original lab order. Calling and faxing information between labs has been eliminated and using a Rolodex to store a patient's standing order test history is a thing of

the past. Filing and re-filing lab orders has been done away with and the department saved 300 man-hours a month by eliminating the need to call the other labs to track down information. As an unexpected benefit, the lab technicians began using the database of lab orders as a quality check tool. If a technician had any questions about a test or combination of tests, the original standing order is now quickly verified, a process not done as often prior to DocuWare.

Kelly Syvertson, Information Systems Coordinator for the Radiology Department, estimates that DocuWare has saved his department four hours a day and made things easier for both the patients and the staff.

In the Billing Office, the biggest benefit from using DocuWare occurs when the hospital is disputing a payment with an insurance company. Prior to DocuWare, the 11 Billing Reps combined spent between 4,700-7,000 hours a year just looking for information contained in the EOB forms. By substantially reducing this access time, more claims are disputed with insurance companies

sooner, resulting in a faster receipt of payment. Additionally, having the insurance cards available in DocuWare, provides the reps with immediate access to the information they need to resubmit a claim if necessary. Steve Scharmann estimates that cost savings realized from the EOB DocuWare application alone could pay for the entire DocuWare system. Additionally, the DocuWare solutions in all departments result in greater employee satisfaction thereby reducing employee turnover and making every employee more productive.

Hospital Benefits

In summary, the hospital was able to save 1000 man-hours a month! At a conservative $20.00 per hour this equates to over $20,000 per month. Bozeman Deaconess Hospital was able to easily cost justify the DocuWare investment in less than a year, even without considering the additional benefits of being able to process more lab orders, collect payments from the insurance companies faster and reduce employee turnover. The beauty of the hospital's DocuWare system is that DocuWare addressed the short comings of storing and accessing paper documents without changing the essential business and healthcare processes already in place.

The end result is that patient care has improved significantly and wait times have been reduced as needed information is now readily available to both patients and staff. With DocuWare, the staff is able to spend more time with each patient, improving the quality of the healthcare provided to the individuals and their families.

" *Once we started using DocuWare, if any of our technicians had a question about a test or combination of test, they just go to DocuWare and quickly look at the original standing order. This reverification process is now done a lot more frequently than when we were using the manual system.* "

Jerry Crisp,
Laboratory Manager,
Bozeman Deaconess Hospital