

*Flex Monitoring Team Briefing Paper No. 11*

# **The Current Status of Health Information Technology Use in CAHs**

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This report was prepared in collaboration with the  
Technical Assistance and Services Center  
at the Rural Health Resource Center



**The Flex Monitoring Team** is a consortium of the Rural Health Research Centers located at the Universities of Minnesota, North Carolina at Chapel Hill, and Southern Maine. Under contract with the federal Office of Rural Health Policy (PHS Grant No. U27RH01080), the Flex Monitoring Team is cooperatively conducting a performance monitoring project for the Medicare Rural Hospital Flexibility Program (Flex Program). The monitoring project is assessing the impact of the Flex Program on rural hospitals and communities and the role of states in achieving overall program objectives, including improving access to and the quality of health care services; improving the financial performance of Critical Access Hospitals; and engaging rural communities in health care system development.

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## **The Medicare Rural Hospital Flexibility Program**

The Medicare Rural Hospital Flexibility Program (Flex Program), created by Congress in 1997, allows small hospitals to be licensed as Critical Access Hospitals (CAHs) and offers grants to States to help implement initiatives to strengthen the rural health care infrastructure. To participate in the Flex Grant Program, States are required to develop a rural health care plan that provides for the creation of one or more rural health networks; promotes regionalization of rural health services in the State; and improves the quality of and access to hospital and other health services for rural residents of the State. Consistent with their rural health care plans, states may designate eligible rural hospitals as CAHs.

CAHs must be located in a rural area or an area treated as rural; be more than 35 miles (or 15 miles in areas with mountainous terrain or only secondary roads available) from another hospital or be certified before January 1, 2006 by the State as being a necessary provider of health care services. CAHs are required to make available 24-hour emergency care services that a State determines are necessary. CAHs may have a maximum of 25 acute care and swing beds, and must maintain an annual average length of stay of 96 hours or less for their acute care patients. CAHs are reimbursed by Medicare on a cost basis (i.e., for the reasonable costs of providing inpatient, outpatient and swing bed services).

The legislative authority for the Flex Program and cost-based reimbursement for CAHs are described in the Social Security Act, Title XVIII, Sections 1814 and 1820, available at [http://www.ssa.gov/OP\\_Home/ssact/title18/1800.htm](http://www.ssa.gov/OP_Home/ssact/title18/1800.htm)

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## EXECUTIVE SUMMARY

This report examines the use of Health Information Technology (HIT) in Critical Access Hospitals (CAHs). CAHs are small, rural hospitals that are either located 35 miles from another hospital (or 15 miles in areas with mountainous terrain or only secondary roads) or state-certified as necessary providers of care. CAHs may have a maximum of 25 acute care and swing beds, and must maintain an annual average length of stay of 96 hours or less for their acute care patients.

A random sample of 400 CAHs was selected from the 1,189 CAHs certified as of December 2005, and surveyed from March 7 to April 7, 2006 using a web-based survey with a follow-up phone survey for web non-responders. A total of 333 CAHs (83.3%) responded to the survey. Of these, 210 (63%) responded to the web version of the survey and 123 (37%) responded to the phone survey.

The survey found that CAHs have relatively high use rates for many administrative and financial HIT applications, such as claims submission, billing, accounting, and patient registration, but much lower use rates for a number of clinical applications, such as bar-coded patient identification bracelets and electronic medical records. Half of CAHs have a formal Information Technology (IT) plan, and three-quarters of CAH budgets include funding for purchasing IT. The vast majority of CAHs have high speed Internet access, and many CAHs are computerizing radiology, lab, and pharmacy functions.

These results indicate that adoption of HIT is a priority for CAHs and suggest that Medicare cost-based reimbursement has permitted many CAHs to make some initial investments in HIT infrastructure. However, CAH use rates for several technologies are lower than the overall rates for hospitals reported by the American Hospital Association and others. To realize HIT's potential for improving access to care and the quality of care in rural areas as envisioned by the Institute of Medicine, the National Advisory Committee on Rural Health and Human Services, and others, continued public and private efforts are essential. These efforts need to focus on increasing the use of HIT clinical applications in CAHs and increasing interconnectivity of CAHs and other health care providers, allowing exchange of individual and population health information.

## **INTRODUCTION**

Both the public and private sectors have focused considerable attention on health information technology (HIT) as a potential means of improving the quality, safety, and efficiency of health care (MedPAC, 2004). A comprehensive AHRQ evidence report on HIT costs and benefits concluded that HIT has the potential to “enable a dramatic transformation in the delivery of health care, making it safer, more effective, and more efficient” (Shekelle, Morton, and Keeler, 2006).

According to the National Advisory Committee on Rural Health and Human Services, HIT presents multiple opportunities for improving population health, monitoring chronic disease and improving access to health care in rural areas (NACRHHS, 2006).

Investment in HIT is a key component of the Institute of Medicine Committee on the Future of Rural Health Care’s strategy to address quality challenges in rural communities (IOM, 2005).

Information on HIT adoption in rural settings is limited, but suggests that use rates are much lower in rural and small hospitals than in urban and larger hospitals (AHA, 2005; Brooks, Menachemi, Burke and Clawson, 2005). Rural communities face many challenges in adopting HIT, including limited access to capital and infrastructure, lack of workforce expertise and difficulty in obtaining community buy-in. However, rural communities also have strengths that may facilitate HIT adoption, including the smaller size and less complex nature of rural health care systems (NACRHHS, 2006; NRHA, 2006).

## **Purpose of this Project**

The purpose of this project is to assess the current status of health information technology (HIT) use in CAHs nationally. This project is part of the federal Office of Rural Health Policy's initiative to implement national performance measures for the Medicare Rural Hospital Flexibility Program.

## **METHODS**

This study was conducted by the Flex Monitoring Team in collaboration with the Technical Assistance and Services Center (TASC) at the Rural Health Resource Center in Duluth, Minnesota. Data for the study came from a national survey of CAHs conducted in March and April 2006. A random sample of 400 CAHs was selected from the 1,189 CAHs certified as of December 2005, using a national list of all CAHs maintained by the University of North Carolina as part of the Flex Monitoring Team activities. The survey was developed by the University of Minnesota Rural Health Research Center, based on a preliminary list of health information technologies compiled by the Office of Rural Health Policy and a review of the literature on the use of HIT in rural hospitals.

The first round of the survey was conducted as a web-based survey from March 7 to April 7, 2006. TASC obtained e-mail addresses for CAH CEOs or designees from State Flex Coordinators in the 45 states with CAHs, and sent an e-mail including a link to the survey to the CAHs for which e-mail addresses were available. Over the next three weeks, up to five e-mail reminders from TASC were sent to non-responding CAHs, and

State Flex Coordinators also contacted CAHs in their states to encourage participation. From March 31 to April 7, University of Minnesota RHRC staff conducted phone surveys of CAHs that did not respond to the web survey and those for whom the research team did not have an e-mail address.

A total of 333 CAHs in the sample responded to the survey, for an overall response rate of 83.3%. Of these, 210 (63%) responded to the web version of the survey and 123 (37%) responded to the phone survey. Table 1 shows the distribution of survey respondents by year of CAH conversion. Respondent CAHs are located in 43 of the 45 states with CAHs. They do not differ significantly from non-respondents by date of conversion or average number of beds.

## **SURVEY RESULTS**

### **Health Information Technology Infrastructure**

Each CAH was asked whether they had a formal Information Technology (IT) plan; whether the hospital budget includes funding for purchasing IT; the number of computers in the facility; use of personal data assistants (PDAs) for patient care; access to the Internet and e-mail; and if the hospital has a website (Table 2).

#### *Data Highlights*

- Half of CAHs have a formal Information Technology plan.
- Three-quarters of CAH budgets include funding for purchasing IT.
- The majority of CAHs (83%) have more than 20 computers in their facility.
- In 36% of CAHs, clinicians use personal data assistants (PDAs) for patient care.

- All CAHs report having some type of Internet access, with 98% having high speed Internet connections.

### **Computerization of Administrative, Financial, and Patient Management Functions**

CAHs were asked about computerization of administrative and financial functions, including claims submission, patient billing, accounting, and payroll (Table 3), and of patient management processes, including registration/admission, discharge, scheduling of procedures, and use of bar-coded patient identification bracelets (Table 4).

#### *Data Highlights*

- 95% or more of CAHs have computerized claims submission, patient billing, accounting, payroll, and patient registration and admission processes.
- Computerization of patient discharges is reported by 73% of CAHs and computerized scheduling of procedures by 44% of CAHs.
- 16% of CAHs use bar-coded patient identification bracelets.

### **Electronic Access to Guidelines and Patient Data in CAHs**

CAHs were asked about electronic access to clinical guidelines and pathways for clinicians, use of electronic medical records (EMRs), and computerization of patient information and incident/error reporting (Table 5).

#### *Data Highlights*

- Clinicians have electronic access to clinical guidelines and pathways in 51% of CAHs. Access to guidelines on the Internet is twice as common (42% of CAHs) as having them available on hospital computers or servers (21%).
- 21% of CAHs use some type of electronic medical record (EMR), including inpatient (18%), outpatient (15%) and Emergency Department (13%) EMRs. Ten percent of CAHs use EMRs in all three settings.
- One-third of CAHs have medication administration records (MARs) in an electronic format. Other clinician charting is done electronically in less than 20% of CAHs.

## **Computerization of Pharmacy Functions**

CAHs were asked about computerization of several pharmacy functions, including prescriber order entry, and screening for patient allergies and potential drug interactions, as well as the use of automated medication dispensing machines and telepharmacy (Table 6).

### *Data Highlights*

- One-quarter of CAHs report having computerized prescriber order entry.
- Computers are used to screen for patient allergies and potential drug interactions in 48% of CAHs.
- One-third of CAHs use automated medication dispensing machines.
- 24% of CAHs use telepharmacy to have a pharmacist at another site review medication orders via fax or electronic transmission.

## **Computerization of Laboratory and Radiology Functions**

CAHs were asked about computerization of lab and radiology functions, including clinician ordering and review of lab tests and radiographs and use of teleradiology (defined as transmitting radiographic images electronically to radiologists at another site) (Table 7).

### *Data Highlights*

- 46% of CAHs have computerized clinician ordering of lab tests, and 58% have computerized clinician review of lab test results.
- 42% have computerized ordering of radiographs by clinicians and 60% have computerized clinician review of radiology results.
- 80% of CAHs use teleradiology.

## **Use of Telemedicine and Electronic Sharing of Data**

CAHs were asked about their use of telemedicine and electronic sharing of clinical data within the hospital, with physician offices/clinics and long term care facilities in their community, and with other hospitals (Table 8).

### *Data Highlights*

- Clinicians use telemedicine technology in 27% of CAHs.
- Seven percent of CAHs share clinical data electronically among all departments. In 45% of CAHs, no electronic sharing of clinical data takes place among hospital departments.
- 32% of CAHs have physician offices/clinics and long term care facilities in the community electronically connected to the hospital information system.
- 23% of CAHs share clinical data electronically with other hospitals.

## **CONCLUSIONS**

This survey found that CAHs have relatively high use rates for many administrative and financial HIT applications, such as claims submission, billing, accounting, and patient registration, but much lower use rates for a number of clinical applications, such as bar-coded patient identification bracelets and electronic medical records. These findings are consistent with a general pattern of greater diffusion of administrative and financial related technology in health care settings compared to clinical applications (MedPAC, 2004).

Half of CAHs have a formal Information Technology plan, and three-quarters of CAH budgets include funding for purchasing IT. The vast majority of CAHs have high speed Internet access, and many CAHs are computerizing radiology, lab, and pharmacy

functions. These results indicate that adoption of HIT is a priority for CAHs and suggest that Medicare cost-based reimbursement has permitted many CAHs to make some initial investments in HIT infrastructure.

However, CAH use rates for several technologies, including use of electronic medical or health records, are lower than the overall rates for hospitals reported by the American Hospital Association (AHA, 2005) and the National Center for Health Statistics (Burt and Hing, 2005). The CAH use rates for some pharmacy-related technologies also are lower than those reported by a national sample of rural hospitals (Casey, Moscovice, and Davidson, 2005).

To realize HIT's potential for improving access to care and the quality of care in rural areas as envisioned by the Institute of Medicine, the National Advisory Committee on Rural Health and Human Services, and others, continued public and private efforts are essential. These efforts need to focus on increasing the use of HIT clinical applications in CAHs and increasing interconnectivity of CAHs and other health care providers, allowing exchange of individual and population health information.

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**Table 1**  
**Characteristics of CAH Survey Respondents**  
**(n = 333)**

	<b>Number (Percent) of CAHs</b>
<b>Year of CAH Conversion</b>	
1994-1998	9 (2.7%)
1999	28 (8.4%)
2000	49 (14.7%)
2001	62 (18.6%)
2002	52 (15.6%)
2003	40 (12.0%)
2004	55 (16.5%)
2005	38 (11.4%)
<b>Number of Beds</b>	
Mean	21.9
Range	4 - 25

**Table 2**  
**Health Information Technology Infrastructure in CAHs**  
**(n = 333)**

	<b>Number (Percent) of CAHs</b>
Has a formal Information Technology plan	172 (51.7%)
Hospital budget includes funding for purchasing IT	252 (75.7%)
Number of computers in hospital	
5 to 10	5 (1.5%)
11 to 15	21 (6.3%)
16 to 20	31 (9.3%)
More than 20	276 (82.9%)
Hospital website	259 (77.8%)
Type of Internet access	
Dial-up only	6 (1.8%)
Dial-up plus high speed and/or wireless	9 (2.7%)
High speed only	257 (77.2%)
High speed and wireless	50 (15.1%)
Wireless only	11 (3.3%)
Secure e-mail	264 (79.3%)
Clinician use of PDAs for patient care	120 (36.0%)
Physicians, PAs, NPs	109
Registered Nurses	21
Pharmacists	31
Others	6

**Table 3**  
**Computerization of Administrative and Financial Functions in CAHs**  
**(n = 333)**

	<b>Number (Percent) of CAHs</b>
Claims submission	327 (98.5%)
Patient billing	324 (97.9%)
Accounting	325 (97.9%)
Payroll	320 (96.1%)
Materials management (supplies)	223 (67.0%)

**Table 4**  
**Computerization of Patient Management Processes in CAHs**  
**(n = 333)**

	<b>Number (Percent) of CAHs</b>
Patient registration/ admission	316 (94.9%)
Patient discharge	244 (73.3%)
Scheduling of procedures	145 (44.1%)
Use bar-coded patient identification bracelets	54 (16.2%)

**Table 5**  
**Electronic Access to Guidelines and Patient Data in CAHs**  
**(n = 333)**

	<b>Number (Percent) of CAHs</b>
Clinicians have electronic access to clinical guidelines and pathways	170 (51.1%)
Guidelines and pathways are available on hospital computers/server	71 (21.3%)
Clinicians obtain guidelines and pathways as needed on the Internet	139 (41.7%)
Hospital has electronic medical records	69 (20.7%)
For inpatients	60 (18.0%)
For outpatients	49 (14.7%)
For Emergency Department patients	44 (13.2%)
For inpatient, outpatient and ED patients	33 (9.9%)
Patient information is kept in electronic format	
Physician notes	57 (17.2%)
Medication administration records (MARs)	111 (33.4%)
Recording of vital signs	64 (19.2%)
Nursing flow sheets	62 (18.6%)
Computerized incident/error reporting	98 (29.8%)

**Table 6**  
**Computerized Pharmacy Functions in CAHs**  
**(n = 333)**

	<b>Number (Percent) of CAHs</b>
Prescriber order entry	85 (25.5%)
Screening for patient allergies, potential drug interactions	157 (47.4%)
Dose recommendations/checks (e.g., based on weight and renal function)	138 (42.0%)
Obtaining up-to-date manufacturer & FDA information and alerts regarding drugs	181 (55.4%)
Use of automated dispensing machines	110 (33.1%)
Telepharmacy (having a pharmacist at another site review medication orders via fax or electronic transmission)	78 (23.6%)

**Table 7**  
**Computerized Laboratory and Radiology Functions in CAHs**  
**(n = 333)**

	<b>Number (Percent) of CAHs</b>
Clinician ordering of lab tests	152 (45.7%)
Tracking of lab specimens	170 (51.8%)
Clinician review of lab test results	194 (58.4%)
Clinician ordering of radiographs	140 (42.2%)
Clinician review of radiology results	198 (59.5%)
Teleradiology (transmission of radiographic images electronically to radiologists at another site)	267 (80.2%)

**Table 8**  
**Use of Telemedicine and Electronic Sharing of Data**  
**(n = 333)**

	<b>Number (Percent) of CAHs</b>
Clinicians use telemedicine technology to consult with clinicians at other sites regarding patient diagnosis and/or treatment	89 (26.7%)
Hospital transmits EKG tracings electronically to clinicians at other sites	120 (36.4%)
Departments within hospital share clinical data electronically	
None	150 (45.1%)
Some departments	111 (33.3%)
Most departments	49 (14.7%)
All departments	23 (6.9%)
Physician offices/clinics in community are connected electronically to the hospital's information system	106 (31.8%)
Long term care facilities in community are connected electronically to the hospital's information system	107 (32.3%)
Hospital shares clinical data electronically with other hospitals	78 (23.4%)

## **Appendix: ACRONYMS USED IN THIS REPORT**

### **CAH: Critical Access Hospital**

A CAH is a facility that is designated as a CAH by the State in which it is located and meets the following criteria:

- Is a rural public, non-profit or for-profit hospital; or hospital that was closed within the previous ten years; or health clinic that was downsized from a hospital;
- Is located in a State that has established a State plan with CMS for the Medicare Rural Hospital Flexibility Program;
- Is located more than a 35-mile drive from any other hospital or CAH (in mountainous terrain or in areas with only secondary roads available, the mileage criterion is 15 miles); or is certified before January 1, 2006 by the State as being a necessary provider of health care services to residents in the area;
- Makes available 24-hour emergency care services 7 days per week;
- Provides not more than 25 acute care inpatient beds for providing inpatient care; and
- Provides an annual average length of stay of less than 96 hours per patient for acute care patients.

### **Flex Program: Medicare Rural Hospital Flexibility Program**

The Medicare Rural Hospital Flexibility Program (Flex Program) was authorized by section 4201 of the Balanced Budget Act of 1997 (BBA), Public Law 105-33. The Flex Program provides funding to States for the designation of critical access hospitals (CAHs) in rural communities and the development of networks to improve access to care in these communities. Under the program, hospitals certified as CAHs can receive cost-based reimbursement from Medicare.

### **ORHP: federal Office of Rural Health Policy**

The Office of Rural Health Policy (ORHP) promotes better health care service in rural America. Established in August 1987 by the Administration, the Office was subsequently authorized by Congress in December 1987 and located in the Health Resources and Services Administration. Congress charged the Office with informing and advising the Department of Health and Human Services on matters affecting rural hospitals, and health care, co-coordinating activities within the department that relate to rural health care, and maintaining a national information clearinghouse. Additional information is available at <http://www.ruralhealth.hrsa.gov/>