



CHALLENGES IN PROVIDING CARE FOR ACUTE
CORONARY SYNDROME IN RURAL MONTANA AND
NORTHERN WYOMING, 2009 -





INTRODUCTION

In recent years, the treatment of acute coronary heart disease has focused on the urgency of restoring blood flow to the heart. The choice of treatment for immediate reperfusion or conservative management depends, in part, on the type of heart attack and the duration of symptoms. The American College of Cardiology and the American Heart Association continue to update clear and specific treatment guidelines supported by growing evidence. (1,2) Authorities now suggest that the largest gains to be made in decreasing mortality from heart disease are likely to come from developing systems of care to apply the evidence we already have. (3)

Several states have successfully developed model regional hub and spoke systems to improve the care and outcomes of patients with acute myocardial infarction. (4) However, facilities in rural areas of Montana and northern Wyoming face unique challenges in treating and transferring patients with acute myocardial infarction. Pre-hospital diagnostic capability may be limited so that precise diagnoses from an electrocardiogram (ECG) are not routinely available prior to a patient's arrival at the emergency department (ED). Implementing current guidelines for acute coronary syndromes, particularly for the 2007 update for ST-segment elevation myocardial infarction (STEMI), requires timely coordination between non-interventional hospitals and cardiac

referral centers which may be separated by long distances. (1) In 2004 through 2006, many Montana critical access hospitals participated in an acute myocardial infarction (AMI) stabilization and transfer project which was coordinated by the Montana Rural Healthcare Performance Improvement Network. During this project, acute cardiac care tools were created specifically for rural hospitals, but the formal activities ended in 2006.

To assess the existing resources and current needs in Montana and northern Wyoming, the Montana Cardiovascular Health (CVH) Program, in cooperation with the Montana Chapter of the American College of Cardiology and the American Heart Association (AHA), conducted a survey of non-interventional hospitals in the region. The survey focused on pre-hospital/Emergency Medical Services (EMS) issues and ED care as well as the processes for referral to cardiac interventional hospitals with an emphasis on STEMI. At the end of the survey, respondents were asked to rate their processes of care and indicate their level of interest in developing and revising protocols for coordination. This report summarizes the responses from 41 hospitals in Montana and northern Wyoming.



METHODS

The Montana CVH Program obtained a list of 64 hospitals in Montana from the Montana Hospital Association website, and a list of the 12 hospitals in northern Wyoming was obtained from the Wyoming Heart Disease and Stroke Prevention Program Manager. Northern Wyoming hospitals were included because cardiac patients from these hospitals are often referred to cardiac interventional facilities in south-central Montana. Six specialty hospitals were excluded because they did not provide acute care for adults. A cardiac interventional hospital was defined as a hospital that offered invasive cardiac procedures (e.g., percutaneous intervention and/or coronary artery bypass grafting). The nine cardiac interventional facilities in this region all are located in Montana and were excluded from this survey.

The Montana CVH Program developed the survey tool with input from the Montana Chapter of the American College of Cardiology, and questions were adapted from the AHA STEMI survey. For the remaining 61 non-interventional hospitals in Montana and northern Wyoming (50 in Montana and 11 in northern Wyoming), a letter was sent to the Chief Medical Director to encourage their ED Directors to complete the survey. A second letter, with the survey instrument, was sent to the ED Director

requesting them to complete and return the survey. Both letters explained the purpose of the study and emphasized the importance of completing the survey. A self-addressed stamped envelope was included in the ED Director's survey packet for their convenience in returning the completed survey. The survey tool also provided a fax number for respondents who were interested in faxing the completed survey tool rather than sending it through the mail.

The survey consisted of 43 primary questions about hospital demographics, pre-hospital cardiac care, emergency department protocols and procedures, STEMI capacity, referrals to cardiac interventional facilities and overall assessment of cardiac care and needs/opportunities. To evaluate the responses, questions that did not have a response were excluded from the analysis for that particular question. Some questions required more than one response. If more than one response was given, each response was counted as an individual response.

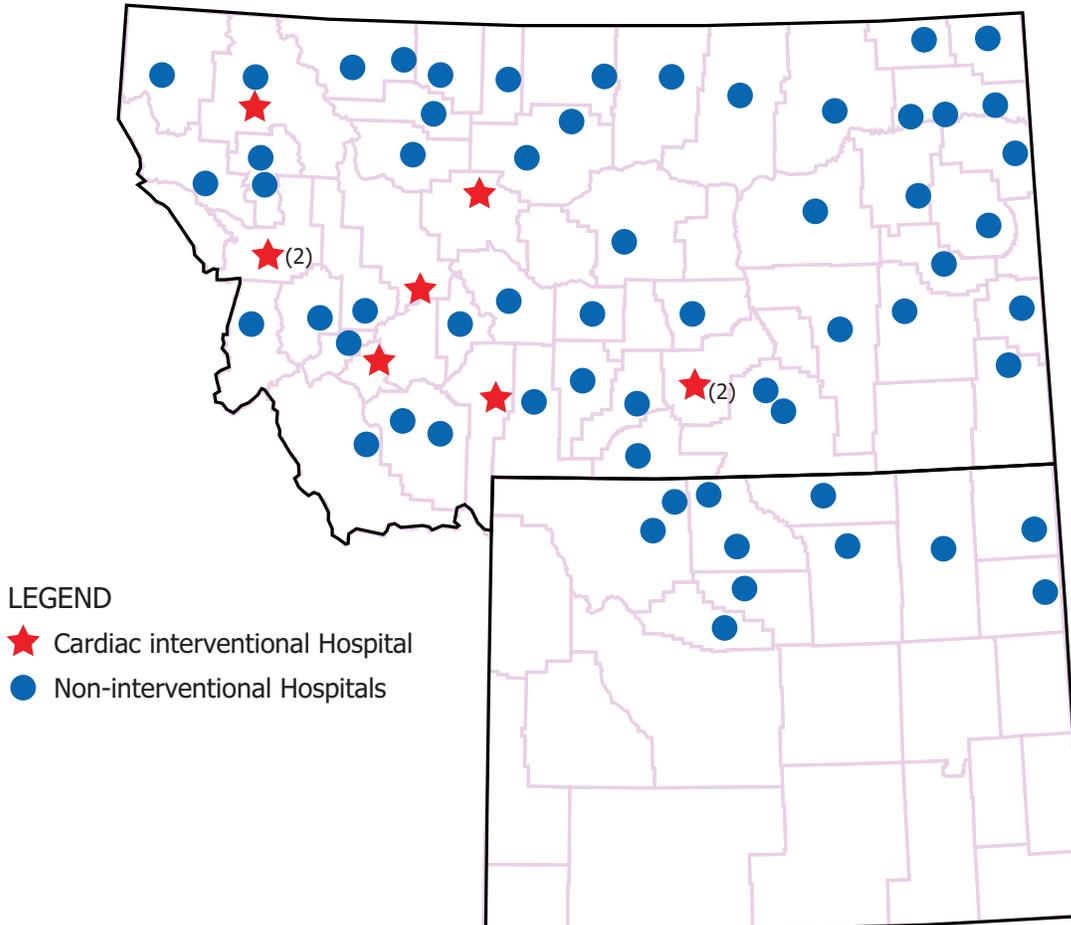
The survey was mailed to the ED Directors at each non-interventional hospital. To increase the response rate, two and four weeks after the initial mail-out, telephone reminder calls were placed to ED Directors who did not return the questionnaire. Data analyses were completed using SPSS V14.0 software (SPSS Inc., Chicago, IL).



RESULTS

The figure illustrates the location of the nine interventional and 61 non-interventional hospitals in Montana and northern Wyoming. (Figure)

FIGURE: Location of non-interventional hospitals and cardiac interventional hospitals in Montana and northern Wyoming, 2009.





Forty-one (67%) of the 61 non-interventional hospitals completed the survey. The majority of hospitals responding to the survey were critical access hospitals (CAH), and all had cardiac enzyme testing available 24 hours a day 7 days a week (24/7). (Table 1)

Table 1. Hospital demographic characteristics and availability of laboratory services for cardiac enzyme testing in non-interventional hospitals, Montana and northern Wyoming, 2009.

	Total N = 41
	Mean (SD)
Number of in-patient beds	19.9 (8.9)
Number of patients seen in ED	3603 (3997)
	% (n)
Critical access hospital	95 (39)
Laboratory services available 24/7	100 (41)
Performs cardiac enzyme testing	100 (41)
Troponin	100 (41)
Total CK	90 (37)
Total CK-MB	88 (36)
Cardiac enzyme tests available 24/7	100 (41)



The responding hospitals estimated that about half the patients with acute chest pain arrived by ambulance. Almost 90% of responding hospitals reported that their EMS staff always notified the ED in route about the possibility of a patient having a heart attack, but only eight facilities reported that their EMS had the capability of performing a 12-lead ECG. There were many barriers to the routine transmission of pre-hospital ECG tracings to the local facility. (Table 2)

Table 2. Pre-hospital care for patients with chest pain or rule out myocardial infarction, Montana and northern Wyoming, 2009.

	Total N = 41
	% (n)
EMS staff always notifies ED in route	88 (36)
Capacity to perform 12-lead ECG*	20 (8)
EMS personnel read ECG and interpretation called by phone or radio	63 (5)
ECG transmitted to hospital	12 (1)
Unable to transmit ECG	68 (28)
Geographic "dead spots"	25 (7)
Technological resources	32 (9)
Limited by type of EMS service	11 (3)
Pre-hospital thrombolysis used in community	7 (3)

*2 sites unable to transmit



Most facilities reported that their facility had an ED chest pain protocol, which included many important elements as shown in (Table 3).

Table 3. Elements and use of emergency department chest pain protocols by non-interventional hospitals, Montana and northern Wyoming, 2009.

	Total N = 41
	% (n)
ED chest pain protocol	95 (39)
Chest pain protocol always used	69 (27)
Element included in chest pain protocol include:	
History of symptom onset	92 (36)
ECG within 10 minutes of ED arrival	95 (37)
MONA*	95 (37)
STEMI checklist and thrombolysis eligibility	77 (30)
Adjunctive Rx interventions	69 (27)
Troponin and other cardiac enzymes	97 (38)
Cardiac Risk Score	13 (5)

*MONA – Morphine, Oxygen, Nitroglycerin and Aspirin



A total of 28 facilities reported that there was a specific protocol for AMI used in the ED; however, only about half included procedures specifically for STEMI. (Table 4)

Table 4. Elements and use of emergency department AMI protocols by non-interventional hospitals, Montana and northern Wyoming, 2009.

	Total N = 41
ED AMI protocol	68 (28)
AMI protocol always used	75 (21)
AMI protocol last updated in 2007 or 2008	79 (22)
AMI protocol includes procedures specific for STEMI	50 (14)
Assessment for thrombolytics	100 (14)
Contraindications for ECG within 10 minutes of ED arrival	43 (6)
Thrombolytic agent – Alteplase	29 (4)
Thrombolytic agent – Reteplase	29 (4)
Thrombolytic agent – Tenecteplase	43 (6)
Other thrombolytic agent*	21 (3)
Observation and transfer to cardiac interventional facility	57 (8)

*TNKase



Most facilities reported they had staff available 24/7 to recognize STEMI, and most had treated patients with thrombolytic agents in the ED during 2007. A third of the responding facilities reported making the decision to treat without waiting for a telephone cardiac consultation which usually took, on average, 11 minutes. (Table 5)

Table 5. Recognition of STEMI and use of thrombolytic therapy, Montana and northern Wyoming, 2009.

	Total N = 41
	% (n)
Staff available 24/7 who can recognize STEMI on ECG	90 (37)
Make decision to treat eligible STEMI patient with thrombolytics before discussing with cardiologist	32 (13)
Frequently wait to confirm treatment with cardiologist	31 (4)
	Mean (range)
Time it takes to reach and speak with a cardiologist	11.2 (4 - 30)
In 2007, number of times STEMI patients treated with thrombolytics in ED	3.6 (0 - 15)
Critical access hospital (CAH)	3.4 (0 - 15)
Non-CAH	6.5 (3 - 15)



Survey respondents were asked to rate different aspects of acute cardiac care in their community. Approximately one-quarter of the respondents rated pre-hospital as excellent while over half the responding hospitals rated the ED, cardiac consultative services via telephone and transfer procedures as excellent. (Table 6) Most facilities were interested in reviewing and updating protocols for AMI and STEMI as well as training in recognition of STEMI. Twenty-nine hospitals responded they would be interested in working on particular components of STEMI care in Montana in cooperation with cardiac referral centers using a regional or hub-and-spoke approach. (data not shown)

Table 6. Rating of acute cardiac care in community, Montana and northern Wyoming, 2009.

	Excellent	Good	Poor
	% (n)	% (n)	% (n)
Pre-hospital	27 (11)	61 (25)	12 (5)
Emergency Department	61 (25)	39 (16)	
Cardiac consultation via phone	51 (21)	46 (19)	2 (1)
Transfer to cardiac referral hospital	51 (21)	49 (20)	



DISCUSSION

The Montana CVH Program, in cooperation with key stakeholders, is coordinating a cardiac workgroup to address the needs identified in the survey. The first meeting was held in February 2009 and included representatives from the Montana Chapter of the American College of Cardiology, Montana Association of Cardiovascular and Pulmonary Rehabilitation, Mountain-Pacific Quality Health Foundation and critical access hospitals in rural Montana. The workgroup reviewed findings from this survey and made recommendations about setting up an ongoing process to offer hospitals opportunities to review and update their protocols, sponsor provider training initiatives and address pre-hospital issues related to acute cardiac care including education and transfer protocols

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