

Advanced Life Support Pilot Project

Final Report

Narrative

The following information is being provided as a final report of findings and recommendations of the Advanced Life Support (ALS) Pilot Project. The data provided in this report covers a period commencing June 18, 2004 and concluding on December 31, 2004. An interim report was produced and published on November 23, 2004. This document is an extension of that information and provides a total summary of data collected in table form. Also provided is a medical review of data and patient outcome.

Five ALS providers took part in the pilot project: Fitch-Rona EMS, Town of Madison Fire Department/EMS, City of Madison Fire Department/EMS, City of Middleton EMS, and Sun Prairie EMS. Sun Prairie EMS began providing paramedic service to their community as of August 9, 2004 and began participating in the pilot project on November 8, 2004 after meeting the requirements for participation set forth by the Steering Subcommittee. This subcommittee consists of representatives of Dane County EMS, Fire Fighter Union Local 311, the Public Safety Communications Center, and one representative from each of the participating ALS providers.

A Memorandum of Understanding was developed by the participating agencies and signed by their governing bodies. This document provided the guiding principles for the pilot. It specified that the closest available municipal ALS ambulance would provide ALS care within Dane County. In addition, BLS service providers would receive the closest available ALS ambulance on those calls determined by the Medical Priority Dispatch System (MPDS) to be categorized under the currently adopted list of automatic aid codes or when requested by a BLS provider.

The Medical Priority Dispatch System was fully implemented into the Public Safety Communications Center on February 18, 2002. The system is intended to assess each 911 call medically to allow allocation of the proper level and speed of EMS care while identifying pertinent safety and clinical information for EMS responders. It also identifies certain life threatening conditions that require full resource allocation while providing life saving instructions to callers. The first automatic dispatch of ALS began on February 1, 2003 with the first dispatch of the closest ALS unit commenced on June 18, 2004.

An additional charge of the steering subcommittee was to study and submit recommendations for the consolidation of medical direction and collaboration among all ALS providers. To that end, an ad hoc subcommittee was formed to study the possibility of medical direction consolidation. The subcommittee will explore potential ways in which this proposal might be accomplished. There are numerous positive reasons in support of this consolidation initiative. The committee will continue to dialogue on this issue with the understanding that resolution will take time.

The ALS Pilot Steering Subcommittee concept worked very well. It provided an avenue by which participating providers could share concerns and request revisions. The subcommittee met monthly during the pilot period.

Data Collection

A Data Collection Subcommittee was formed. They were tasked to review and analyze data on a biweekly basis. The committee had nine members with representation from each of the following constituencies: Firefighters Union Local 311, Dane County BLS providers, Dane County EMS, the Public Safety Communications Center, and a representative from each of the five participating ALS providers.

The Data Collection Subcommittee has met numerous times during the pilot period. Since the commencement of the pilot 533 calls for ALS service have been made. 187 of those calls were a result of Automatic Aid or Closest ALS responses as determined by the Medical Priority Dispatch System, and 142 were manual requests for ALS by Basic Life Support services.

The following tables of information show a summary of all calls handled by the ALS providers outside of their primary response jurisdiction.

Call Volume Summary for Responses Into Other EMS Districts By Each ALS Provider

Participating ALS Agency	Mutual Aid	Auto Aid	BLS Request	Closest ALS	Specific Request	Dispatch Discrepancies	Total Number of Calls
Fitch-Rona EMS	20	17	41	24	0	2	104
City of Madison FD/EMS	44	79	61	3	6	26	219
City of Middleton EMS	11	26	21	8	0	6	72
Sun Prairie EMS	0	5	0	0	0	0	5
Town of Madison FD/EMS	79	5	19	20	1	9	133
TOTALS	154	132	142	55	7	43	533

The following definitions are provided for clarification:

Mutual Aid Request – No ambulances were available in the requesting jurisdiction

ALS Intercept (Automatic Aid) – Simultaneous dispatch of an ALS unit with a BLS unit based on the list of high-level Priority Dispatch codes

ALS Intercept (General Request from BLS Services) – Response with a BLS ambulance from another jurisdiction after the BLS unit has requested ALS support

Closest ALS Unit – Responding ALS unit was closer than an ALS unit from the other jurisdiction

Dispatch Discrepancies – Typically, situations where the incident took place near a jurisdictional border and the official location was changed to reflect the proper municipality after the ALS unit from the neighboring jurisdiction arrived on scene

Specific Request for ALS – Situations not covered by any of the above examples

Medical Priority Dispatch System – A standardized commercial training program for 911 call takers with scripted questions and instructions which allows them to:

- 1) Consistently and accurately interrogate 911 callers to determine the exact problem and acuity level of the patient.
- 2) Identify and provide instructions regarding on-scene safety items.
- 3) Allocate the proper level of EMS response and care.
- 4) Give medically sound post-dispatch instructions and life-saving pre-arrival instructions to caller/family.
- 5) Provide accurate information to EMS responders.

List of Predetermined Automatic Aid Codes and ALS Call Activity

Delta	Code Description	Total
3D1	Animal bite - Unconscious or arrest	0
4D1	Assault - Unconscious or arrest	4
7D1	Burns - Unconscious or arrest	0
8D1	Carbon Monoxide - Unconscious or arrest	0
9D1	Ineffective Breathing – Cardiac or respiratory arrest	7
10D1	Chest Pain – Severe respiratory distress	21
10D2	Chest Pain - Not alert	7
12D1	Seizures - Not Breathing	1
12D2	Seizures – Continuous or multiple	47
14D1	Drowning - Unconscious	0
15D1	Electrocution - Unconscious	0
19D1	Heart Problem - Severe respiratory distress	3
19D2	Heart Problems - Not alert	4
23D1	Overdose - Unconscious	11
23D2	Overdose - Severe respiratory distress	0
27D1	Stabbing/Gun Shot – Unconscious or arrest	1
33D1	Interfacility Transfer - Suspected cardiac/respiratory arrest	0
Total Delta		106
Echo	Code Description	
2E1	Ineffective Breathing (Allergic Reaction)	0
6E1	Ineffective Breathing (Breathing Problems)	7
9E1	Cardiac or Respiratory Arrest (Not Breathing)	54
9E2	Cardiac or Respiratory Arrest (Breathing Uncertain)	18
9E3	Cardiac or Respiratory Arrest (Hanging)	4
9E4	Cardiac or Respiratory Arrest (Strangulation)	0
9E5	Cardiac or Respiratory Arrest (Suffocation)	0
9E6	Cardiac or Respiratory Arrest (Underwater)	0
11E1	Ineffective Breathing (Choking)	3
15E1	Ineffective Breathing (Electrocution/Lightening)	0
31E1	Ineffective Breathing (Unconscious/Fainting)	3
Total Echo		89

Prior to the inception of the ALS Pilot Project, the above list of high priority call types was established in which 911 dispatchers were to send the closest available ALS ambulance. This chart illustrates the frequency that ALS ambulances were dispatched to each of the specific high priority call types. This data can be used to evaluate the ways in which ALS resources are being used and if this list of codes should be modified.

Reasons For ALS Support and/or Mutual Aid Received by All Providers

District Receiving ALS Services	Mutual Aid	Auto Aid	BLS Request	Closest ALS	Specific Request	Dispatch Discrepancy	Total
Belleville EMS	0	2	5	0	0	0	7
Blooming Grove, Burke, Maple Bluff EMS	7	6	5	0	1	4	23
Brooklyn EMS	0	4	1	0	0	0	5
Cambridge Area EMS	0	9	8	0	0	0	17
Cross Plains Area EMS	4	7	5	0	0	2	18
Deer-Grove EMS	0	8	4	0	0	0	12
De Forest FD/EMS	0	3	6	0	0	0	9
District 1 EMS	1	6	7	0	0	0	14
Fitch-Rona EMS	69	0	0	13	0	2	84
City of Madison FD/EMS	8	0	0	40	0	12	60
Marshall EMS	0	15	8	0	1	0	24
McFarland EMS	1	8	5	0	0	1	15
Middleton EMS	3	0	1	1	3	1	9
Monona FD/EMS	34	13	4	0	0	4	55
Mount Horeb FD/EMS	3	17	32	0	1	0	53
New Glarus EMS	0	0	2	0	0	0	2
Oregon Area FD/EMS	1	4	14	0	1	1	21
Sauk Prairie EMS	0	1	1	0	0	0	2
Shorewood Hills EMS	0	0	0	0	0	0	0
Stoughton Area EMS	0	3	1	0	0	0	4
Sun Prairie EMS	2	8	3	0	0	1	14
Town of Madison FD/EMS	17	0	0	1	0	12	30
Waunakee Area EMS	3	16	5	0	0	3	27
*Albany EMS	0	0	1	0	0	0	1
*Arena EMS	0	0	2	0	0	0	2
*Arlington EMS	0	0	1	0	0	0	1
*Barneveld EMS	0	0	0	0	0	0	0
*Blanchardville EMS	0	0	1	0	0	0	1
*Curtis Ambulance (Edgerton)	0	2	0	0	0	0	2
*Curtis Ambulance (Madison)	1	0	2	0	0	0	3
*Evansville EMS	0	0	13	0	0	0	13
*Heartline-Medix EMS (Columbus)	0	0	0	0	0	0	0
*Lake Mills EMS	0	0	0	0	0	0	0
*Lodi Area EMS	0	0	1	0	0	0	1
*Plain EMS	0	0	0	0	0	0	0
*Poynette-Dekorrra EMS	0	0	1	0	0	0	1
*Ryan Brothers Ambulance	0	0	1	0	0	0	1
*Spring Green EMS	0	0	2	0	0	0	2
*Waterloo EMS	0	0	0	0	0	0	0
TOTALS	154	132	142	55	7	43	533

* Indicates an Out-of-County or Private EMS Provider. The definitions shown on page 2 should be used when reviewing this table.

ALS Support and/or Mutual Aid Supplied by Each ALS Provider

	ALS Agency Providing Services					
	FREMS	MEMS	MFD	SPEMS	TMFD	Total
District Receiving ALS Services						
Belleville EMS	7	0	0	0	0	7
Bloomington Grove, Burke, Maple Bluff EMS	0	0	23	0	0	23
Brooklyn EMS	0	0	4	0	1	5
Cambridge Area EMS	0	0	16	0	1	17
Cross Plains Area EMS	0	17	1	0	0	18
Deer-Grove EMS	0	0	12	0	0	12
De Forest FD/EMS	0	1	8	0	0	9
District 1 EMS	0	12	2	0	0	14
Fitch-Rona EMS		1	8	0	75	84
City of Madison FD/EMS	27	13		0	20	60
Marshall EMS	0	0	18	5	1	24
McFarland EMS	0	0	13	0	2	15
Middleton EMS	1		8	0	0	9
Monona FD/EMS	0	0	43	0	12	55
Mount Horeb FD/EMS	45	3	2	0	3	53
New Glarus EMS	2	0	0	0	0	2
Oregon Area FD/EMS	3	0	7	0	11	21
Sauk Prairie EMS	0	2	0	0	0	2
Shorewood Hills EMS	0	0	0	0	0	0
Stoughton Area EMS	0	0	3	0	1	4
Sun Prairie EMS	0	0	14		0	14
Town of Madison FD/EMS	14	0	16	0		30
Waunakee Area EMS	0	19	8	0	0	27
*Albany EMS	0	0	0	0	1	1
*Arena EMS	0	2	0	0	0	2
*Arlington EMS	0	0	1	0	0	1
*Barneveld EMS	0	0	0	0	0	0
*Blanchardville EMS	1	0	0	0	0	1
*Curtis Ambulance (Edgerton)	0	0	2	0	0	2
*Curtis Ambulance (Madison)	2	0	0	0	1	3
*Evansville EMS	1	0	8	0	4	13
*Heartline-Medix EMS (Columbus)	0	0	0	0	0	0
*Lake Mills EMS	0	0	0	0	0	0
*Lodi Area EMS	0	1	0	0	0	1
*Plain EMS	0	0	0	0	0	0
*Poynette-Dekorrra EMS	0	0	1	0	0	1
*Ryan Brothers Ambulance	1	0	0	0	0	1
*Spring Green EMS	0	1	1	0	0	2
*Waterloo EMS	0	0	0	0	0	0
TOTALS	104	72	219	5	133	533

This table illustrates the number of times that each of the participating ALS providers supplied ALS support or mutual aid responses in support of another EMS district. As expected, this data reveals the relationships and interactions between all EMS providers and helps to define the regional scope of the pilot project. For example, we can see that Fitch-Rona EMS (shown under the column titled “FREMS”) primarily supplied services to Belleville EMS (7 times), City of Madison FD/EMS (27 times), Mount Horeb FD/EMS (45 times), and Town of Madison FD/EMS (14 times). In contrast, in the row titled “Fitch-Rona EMS” it shows that they received services almost exclusively from the Town of Madison FD/EMS (75 times) and the City of Madison FD/EMS (8 times).

Closest ALS Unit Response into Other ALS Jurisdictions

This table compares the total number of times each ALS provider supplied and received a closer ALS ambulance from a neighboring ALS jurisdiction.

	ALS Unit Receiving Closer ALS					Total Closer ALS Responses Provided
	MFD	FREMS	MEMS	TMFD	SPEMS	
ALS Unit Providing Closer ALS						
City of Madison FD/EMS (MFD)		1	1	1	0	3
Fitch-Rona EMS (FREMS)	24		0	0	0	24
Middleton EMS (MEMS)	8	0		0	0	8
Town of Madison FD/EMS (TMFD)	8	12	0		0	20
Sun Prairie EMS (SPEMS)	0	0	0	0		0
Total Closer ALS Responses Received	40	13	1	1	0	55

Note: The far right column shows the total number of times assistance was provided as the closest ALS unit. The bottom row indicates the total number of times assistance was received.

Funding

The Dane County Executive and County Board of Supervisors allocated a contribution of \$50,000 as a one-time start up fund to support the ALS Pilot project. All participating ALS providers were eligible to receive a set fee of \$150.00 per ALS patient contact for the duration of the pilot project or until all funds were exhausted. To date 240 calls for service have been supported by these funds. Of the original funds, \$14,000 was unspent. The following table shows the distribution of funds through December 31, 2004.

Funds Paid to Participants

ALS Participant	Number of Qualifying Calls	Total Payments to Date
Town of Madison Fire Department	38	\$5,700
City of Middleton EMS	43	\$6,450
City of Madison Fire Department	88	\$13,200
Fitch-Rona EMS	66	\$9,900
Sun Prairie EMS	5	\$750
Totals	240	\$36,000

Funds were disbursed pursuant to procedures established by the pilot Steering Subcommittee and are detailed in the ALS Pilot Memorandum of Understanding. A copy of this document is provided as an attachment. Payment was made for qualifying calls and only after all data elements had been successfully completed, reviewed and accepted by the Steering Subcommittee. The criteria for ALS providers to receive payment was based on physical patient contact wherein advanced life support care or assessment was rendered. The data shows that 139 qualifying calls were provided from June 18th – September 28th, with an additional 101 calls being provided in the last three months of the study for a total of 240.

Medical Review

From June 18th through December 31st, 2004 data was collected on all Emergency Medical Service (EMS) runs in the county where an Advanced Life Support (ALS) unit was called to assist a Basic Life Support (BLS) unit, or when it was dispatched as the closest ALS unit for agreed upon high acuity Priority Medical Dispatch codes (Automatic Aid). In addition to routine information, medical data was collected which included priority dispatch codes, chief complaint, ALS skills used, chest pain/dyspnea scales to ascertain patient improvement, as well as review of the actual run report. On the recommendation of the medical review subcommittee it was decided that a random review of charts having completed information in all data areas would be used. The review was done on information obtained from data collection sheets and run reports from the five participating ALS providers. It was also considered important to review cases that represented definite examples of positive outcomes related to quicker, more coordinated ALS care.

Review of Chest Pain and Dyspnea Scales and Quality of Care

Review was done on all completed data sheets that also had a run report attached. Overall completion was about 70% depending on the service. Codes that were included were all Chest Pain codes (Card 10 MPDS) and all Breathing Problem codes (Card 6 MPDS). The chest pain and dyspnea scales are based upon a numerical (1 to 10) assessment with 10 being the greatest severity based on finding by the paramedic.

The following are the results of improvement in patient condition from patient contact to arrival at the hospital by Medical Priority Dispatch System (MPDS) codes.

The MPDS code shown in the far left column indicates the code as determined by the call taker. The center column gives the number of coded calls and the number reviewed. Example: 10/21 indicates that 10 out of 21 calls were reviewed. The far right column shows average improvement by the patient as it relates to dyspnea (difficulty breathing) and cardiac scale. Therefore in the 6E1-coded patients, 2 of the 3 runs were reviewed with an average positive patient improvement of slightly over 30%. In areas where “n/a” is indicated, either no patient in this code was treated or no information was available.

MPDS Code	Reviewed/ Total	Average Improvement/Patient
10D1 Chest Pain – Severe respiratory distress (auto aid code)	10/21	0.7 points
10D2 Chest Pain – Not alert (auto aid code)	0/7	n/a
10D3 Chest Pain – Clammy	7/11	3.8 points
10C1 Chest Pain – Abnormal breathing	5/5	2.6 points
10C2 Chest Pain – Cardiac history	10/11	3.4 points
10C3 Chest Pain – Cocaine	0/0	n/a
10C4 Chest Pain – Breathing normally, age ≥ 35	4/6	1.5 points
6E1 Breathing Problems – Ineffective Breathing (auto aid code)	2/3	3.1 points
6D1 Breathing Problems – Severe Respiratory Distress	1/7	2 points
6D2 Breathing Problems – Not alert	0/1	n/a
6D3 Breathing Problems – Clammy	1/1	0 (died)
6C1 Breathing Problems – Abnormal breathing	2/2	1.5 points
6C2 Breathing Problems – Cardiac history	0/1	n/a

Overall there was significant improvement in pre-arrival patient condition, primarily in chest pain patients. In review of those run reports, it appeared that most of the patients had ischemic chest pain symptoms or cardiac history, and that the interventions performed were appropriate. The primary ALS interventions in the vast majority of cases were an IV, Aspirin, and Nitroglycerin with very occasional morphine sulfate. The lesser degree of relief in the 10D1 patients (chest pain with severe respiratory distress) can be viewed in several ways. The primary reason is that these patients are in such distress that 10 to 15 minutes of therapy is too short a time to see significant changes. We may also conclude that despite having critical symptoms, the ALS providers were able to stabilize the patients and presented them to the Emergency Department in slightly better condition, thus preventing further deterioration. In one case of the 10D1 group there was a cardiac arrest patient who was resuscitated en route and left the hospital without sequelae.

An interesting finding was the significant improvement in the 10D3 (chest pain and clammy) patients with just nitroglycerin. This may assist in the decision to potentially add this code to our automatic criteria, or to consider sending IV Technician level providers to these patients.

Review of High Acuity Codes that Generate ALS request (Non-Automatic Aid Codes that Generated ALS requests)

The data below represents the particular MPDS codes, the number of times that BLS was dispatched, and the number of times ALS was requested by a BLS unit. It also demonstrates the percentage of requests. Example: Of the 6D2 codes, 14 times BLS responded, 1 time ALS was requested for an average of 7%.

MPDS Codes	BLS Responses	ALS Requested	Percent
6D1 Breathing Problems – Severe Respiratory Distress	131	9	14%
6D2 Breathing Problems – Not alert	14	1	7%
10D3 Chest Pain – Clammy	126	11	9%
10C1 Chest Pain – Abnormal breathing	45	4	9%
10C2 Chest Pain – Cardiac history	100	11	11%
10C4 Chest Pain – Breathing normally, age ≥35	88	4	4.5%
31D1 Unconscious/Fainting	74	9	12%
32D1 Unknown Problem (Man Down) – Life Status Questionable	27	4	15%

The above percentages are close to the ones reported in the ALS Pilot Interim Medical Review of 12/21/04 except that we did not have the numbers for the 31D1 (unconscious at end of interrogation) or the 32D1 (Life Status Questionable). In both of those codes there was one cardiac arrest for a percentage of 1.3% and 3.7% respectively. Further evaluation of these calls will be required to determine whether they should be incorporated.

Review of Accuracy of Codes to Patient Assessment

A random review of 11 charts from one ALS service was done on chest pain and breathing problem patients to see if the MPDS code matched the patient's condition from the paramedic's assessment. Nine of eleven were totally correct for an accuracy of 82%. In one case a 10D3 (clammy) was found not to be clammy, bringing it down to a 10C2. In the other a 10C2 was found to be clammy on scene, making it a 10D3. In neither case would the response have changed.

Taking this statistical information with our known statistics of 95% accuracy of the codes from the 911-call taker, we feel that the system is doing a very good job of identifying the appropriate response with patients need.

Selected Case Studies

Case #1

On 7/13/04 Fitch-Rona EMS was dispatched into the City of Madison as the closest ALS unit for a 12-year-old male who had hung himself. The patient was resuscitated, intubated, and transported to U.W. Hospital where he made a full recovery and was discharged in normal condition. Comments made on the data form submitted by EMS stated "Excellent cooperation with FREMS and MFD!"

Case #2

On 12/6/04 Waunakee EMS was called for a 51-year-old pulseless non-breathing patient. The first-in unit arrived within 6 minutes to find the patient in ventricular fibrillation. The patient was defibrillated and a rhythm was restored. The Madison Fire Department paramedics arrived within 10 minutes and Advanced Cardiac Life Support was initiated. The patient was transported to the University of Wisconsin Hospital Emergency Room and went directly to the cardiac cath lab where a coronary occlusion was opened. The patient did well and was discharged from hospital in normal condition.

Case #3

This case is a great example of the total spectrum of care possible in our new system. On August 22, 2004, a 57-year-old male collapsed in cardiac arrest. His wife called 911, and was given excellent pre-arrival Cardio-Pulmonary Resuscitation (CPR) instructions by one of the Emergency Medical Dispatch certified call takers at the Dane County 911 Center. In response to a county-wide radio broadcast for "any available unit with a defibrillator", a Marshall Police Department officer was first on the scene and performed Public Access Defibrillation. Marshall EMS arrived along with Rescue #8 from the City of Madison, who defibrillated again and began Advanced Life Cardiac Support. Med Flight crew also arrived and assisted in the ambulance en route to the hospital. The patient was admitted to the hospital and made a full recovery.

Case #4

On 11/3/04 a 16-year-old female who discovered she was 2 months pregnant and afraid to tell her family, she tried to hang herself. Her parents found her in the bedroom closet and then cut her down and performed 911-assisted CPR. Middleton EMS responded as the closest ALS unit and found the patient unresponsive. The patient was intubated, stabilized, and transported. The patient and her unborn child made a full recovery and she is now doing well, attending her prenatal clinic regularly.

These cases exemplify what we all knew was possible. By working together we have been able to send the highest level of care to the sickest patients in the least amount of time. Would these patients have survived if we had not sent the closest ALS ambulance? I don't think any of us would want to test that theory. Where a compromised airway or a non-perfusing heart demands care "now", we need to have mechanisms to allow that care to happen anywhere. How we do that is up to us. What we have seen in the ALS Pilot project is that we do have the means and the ways to accomplish this. We have very adequate resources throughout the county and if used wisely, we can accomplish even more.

Conclusions

Data Collection

The goal of this pilot was to collect data on sending the closest available ALS ambulance to render care. This concept included the “blurring” of jurisdictional boundaries. What would happen if we were to send the closest available unit into an adjacent response area? Sending the closest appropriate and available provider to the patient’s side has been a concept that has been discussed for a number of years. It is felt that communities are best served by this approach. Numerous documented reports from the field have substantiated how municipal services are working cooperatively across response jurisdictions in support of patient care. We conclude by documented findings and case studies, that sending the closest available ALS unit regardless of jurisdiction has saved time, and has provided in numerous accounts, positive outcome.

Our appreciation goes to all of the ALS and BLS providers who have worked together on a daily basis to advance our system and the highly trained medical dispatchers that are the link between the caller and the level of response. We also recognize the diligence and dedication of the Pilot Data Collection Subcommittee in reviewing and compiling data required for the pilot.

Technology Advancements

In an attempt to send the closest ambulance, technology was explored in which the dispatch center could monitor the movement of ambulances. This technology is known as Automatic Vehicle Location or AVL. Equipment is placed within each ambulance vehicle that sends a signal to a receiver in the dispatch center that constantly advises them of their location. This allows the Public Safety Communications Center to pinpoint the physical location of all ALS units. The necessary equipment has been purchased and is in the process of being installed in all ALS ambulances. The Public Safety Communication Center received equipment and software in support of this technology through a grant. A pilot test period will be conducted to identify the benefits and limitations of this technology as it relates to our program initiatives.

Revision of Automatic Aid Codes -- A high number of ALS automatic aid calls are for the 12D2 (seizure-continuous/multiple). This code by its nature is difficult to categorize. The patient may be seizing at the time of the call but exhibiting no symptoms upon arrival of medical personnel. The consequences of not sending (and therefore not stopping the seizure) are serious. Unfortunately we cannot tell when the seizure will stop, and therefore ALS is sent frequently. We continue to train the call takers to make sure they are coded correctly. We believe the code is valid as an automatic aids send. We recommend this to continue while making sure all call takers continue to learn how to distinguish serious seizures from non-life threatening. We also need to improve on the ability to call-off the ALS unit if the patient recovers.

The ALS pilot study has shown us that patients are being cared for appropriately. Overall, their condition improved en route to the hospital. The extremely ill are being stabilized and in several cases lives are being saved. The paramedics are working seamlessly across jurisdictional boundaries. ALS is getting to those patients requiring the highest level of care much faster than they ever did before. This can only be translated into improvement in patient care and outcomes.

Response Times

An analysis was conducted by the Public Safety Communications Center of 112 cases of 9E1 (Cardiac or Respiratory Arrest - Not Breathing) that occurred during the period from June 18th through December 31st, 2004. A 9E1 code is the highest acuity level for automatic aid and represents a true life-threatening emergency. When these call types were evaluated, the data showed an average ALS unit response time (measured from the time of initial dispatch to the arrival on scene) of 8 minutes and 3 seconds. Data collected for the interim report also revealed that the average BLS response time to these same calls was approximately 7 minutes, which means that an ALS unit arrived an average of 1 minute after the arrival of a BLS unit, something which rarely ever happened before the start of the ALS Pilot project.

Prior to the incorporation of Automatic Aid (simultaneous dispatch of BLS and ALS ambulances to high priority calls), the BLS unit would typically arrive on scene; conduct a patient assessment, and then determine the need for and request an Advanced Life Support unit to respond. With the adoption of the Automatic Aid codes through the Priority Medical Dispatch system, it can be extrapolated that approximately 7 minutes have been cut from the time that would previously have been needed for an ALS unit to arrive at the side of a critically ill patient being cared for by a BLS unit.

The other application of the Automatic Aid codes is the ability for the Public Safety Communications Center to send an ALS unit from one jurisdiction into a neighboring ALS jurisdiction when it has been determined that it is closer to the location of a high priority incident. This determination of a “Closer ALS” unit is made in real time using some of the technological resources described earlier in this report. Intuitively, it is known that this practice reduces the overall time that would be needed for an ALS unit to arrive at the patient simply based on the relative geographical position of both ALS units. However, because only the “closer” ALS unit was actually sent to the call, we could not reliably determine the reduction in response time, because we could not accurately measure the time that would have been necessary for the more distant ALS unit to respond to the same location.

When we examined the 55 instances of a “Closer ALS” unit being dispatched into another ALS provider’s jurisdiction (see the table on page 6), we once again could appreciate the value of a regional approach to providing ALS services. The majority of cases where ALS units “crossed the border” involved incidents in the far west and southwest portion of the greater Madison metropolitan area. Coincidentally, even as a significant amount of residential and commercial development has occurred in the past six years, these areas have not seen the addition of any new fire or EMS stations. The cooperative arrangement between the ALS providers that became possible through the ALS Pilot program has allowed the most efficient use of the available (and limited) ALS resources in order to better serve all of the citizens in each of the participating communities. We recognized the fact that the residents of each of the participating communities do not simply confine their movements to only those areas within the geographical boundaries of the municipality in which they live. Because the residents themselves routinely cross municipal borders in order to work, shop, and recreate, it is logical to conclude that the regional EMS system should function in much the same way.

Transition of ALS Pilot to ALS Program

A Pilot Steering Subcommittee was formed to oversee the project. All participating agencies had a voice in the process and the development of the MOU. Likewise, their municipal leaders also had opportunities for input during the development phase and full support for the pilot was obtained. As in the pilot, a MOU will be developed outlining the expectations under the ALS Program.

The Pilot Steering Subcommittee will transition into an ALS Program Steering Subcommittee. Their duties will be to evaluate the program as it proceeds. A primary goal will be to study and submit recommendations for the consolidation of medical direction and continued collaboration among all ALS providers. They will also evaluate and review the addition of other municipal providers.

Medical Direction

The pilot MOU charged the Pilot Steering Subcommittee with the task to study and submit recommendations to reach the goal of consolidation of medical direction. An ad hoc subcommittee of the Pilot Steering Subcommittee was formed to meet this requirement. The subcommittee is comprised of representatives from each of the participating ALS providers, Firefighters Union Local 311, Medical Directors, the Public Safety Communications Center and Dane County Emergency Management Department staff. The committee has met on three occasions. They are in the process of identifying and compiling the medical direction needs of each participating ALS provider. This is an ongoing process that will require a great deal of discussion and dedicated work by the committee.

Presently, each of the five ALS services has their own medical director providing medical direction for that specific service. There is a combination of paid and non-paid medical directors. It is a requirement by state statute that each ALS provider has a physician medical director of record.

Addition of Other Providers

Although the ALS pilot has proven successful in time saved and patient care, it is the conclusion of the Steering Subcommittee that there remains the need for an assessment of incorporation of additional ALS providers. These providers could potentially offer an additional response tier to the ALS response venue. This premise is supported in the development of a Program MOU where language has been proposed to evaluate the incorporation of additional ALS providers. It is too early in the ALS Program initiative to speculate on the incorporation of additional units. The next step in the evolution of this undertaking will be to set parameters for interface, evaluation, and monitoring of program progress.

Funding

The County contributed a sum of \$50,000 as a one-time start up fund to support the pilot project. All participating ALS providers were eligible to receive a set fee of \$150.00 per ALS patient contact for the duration of the pilot until those funds were exhausted. Funds were disbursed pursuant to procedures established by the Pilot Steering Subcommittee. ALS providers were not restricted from pursuing recovery of fees for service through claims filed with commercial insurance, Medicaid, and Medicare, or by directly billing patients. Data was to be collected on the cost associated with delivery of ALS services during the pilot. A collection tool was developed to assist in the analysis. This document is known as the Pilot Project Financial Reimbursement Analysis Record. It requested information on the total amount billed to the patient by an ALS service, the amount collected from all payers by the ALS service, and the amount of Medicare, Medicaid and Worker's Compensation allowances. It also asked

for information on Bad Debt/and Write off of costs. The Data Collection Subcommittee continues to collect this data. This information is not available for entry and submission for evaluation until all avenues of reimbursement have been sought. This process may take up to three to six months to accomplish. Then and only then can a clear picture of the costs for providing ALS services be obtained. Due to this fact, the Data Collection Subcommittee does not have the necessary data to give an accurate analysis of cost at this time. It is the intent of the Data Collection Subcommittee to continue their work on obtaining this data from the participating ALS providers and producing a corresponding report on the results in the future.

Back Fill

During the initial discussions “Back Fill” was identified as a potential concern and burden. “Back Fill” is when an ALS ambulance is responding outside its jurisdiction on an ALS request and a neighboring ALS service is needed to provide service within their community because the first ALS unit is committed to the first call. Data has shown that back fill has not been a concern.

Provision of ALS Services

It should also be noted that during the development of the project several ALS providers verbalized very clearly that no “one” provider should carry the burden of providing ALS service within the county. The distribution of calls seen on page 3 clearly shows that the burden is being shared proportionately between the initial four (now five) providers.

Dispatch

BLS service providers received the closest available ALS ambulance on those calls determined by Priority Medical Dispatch as categorized under the currently adopted list of Automatic Aid Codes or when requested by a BLS provider. This meant that ALS and BLS responders would be dispatched simultaneously.

The Medical Priority Dispatch System is the instrument that binds this process together. Without the ability to identify the highest acuity patients from the time of the initial 911 call, all these improvements would have been impossible.

Recommendations

Data Collection

- It is recommended that a Quality Review Subcommittee be formed. They will review and analyze data. The subcommittee will be comprised of one representative from Dane County EMS, Firefighters Union Local 311, one BLS provider representative selected by the Dane County EMS Association, the Public Safety Communications Center, and one representative from each of the participating ALS providers. They would report to the ALS Program Steering Subcommittee.

Technology Advancements

- Advanced technology should be studied and incorporated into the system when it is appropriate and systems capacity and funding are available.
- Incorporate Mobile Data Computers into all ALS and BLS units. This advancement would provide field personnel with detailed incident information as well as location and availability. This interactive tool is a giant step forward in sending the closest available ALS and BLS unit. Continue to look for grant funding in support of technology advancements.
- Work cooperatively with the Public Safety Communications Center on issues relating to system enhancement and technology.

Revision of Automatic Aid Codes

- A thorough review of Automatic Aid Codes and response data should be done periodically to determine the inclusion or exclusion of codes.

Response Times

- Continue to collect and evaluate data on response times.
- Consider other ways in which response times can be shortened.

Transition of Pilot to Program

- Take steps to formalize the transition from an ALS Pilot Project to an ALS Program.
- Incorporate the principles of a quality regional EMS system.
- Develop an Intergovernmental Agreement that details program coordination and operations.
- Use the data collected from the pilot study as a guideline for future program initiatives and decision making.

Medical Direction

- Continue to work through an ad hoc committee to develop options and recommendations for the goal of consolidation of medical direction.

Addition of Other Providers

- Consider expansion of system by incorporation of other ALS and BLS providers.

Funding

Evaluate program cost and research funding alternatives.