

FINDINGS AND RECOMMENDATIONS ON EMERGENCY MEDICAL SERVICES IN KENT COUNTY

NOVEMBER, 2011

Integral Performance Solutions, LLC
PO Box 2128
Lakeland, FL 33806
www.onlineips.com/publicsafety

TABLE OF CONTENTS

1	INTRODUCTION	2
2	OVERALL SYSTEM DESIGN AND GOVERNANCE	4
3	COSTS AND VALUE	9
4	DISPATCH SERVICES	11
5	MFR SERVICES	16
6	AMBULANCE SERVICES.....	19
7	RESPONSE INTERVALS	22
8	HEALTHCARE SYSTEM INTEGRATION	36
9	INFORMATION SYSTEMS.....	38
10	EVALUATION AND QUALITY MANAGEMENT	40
11	SUMMARY	43
12	APPENDIX.....	45

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

Acknowledgements and Forward

A competent review of an entire EMS system is a daunting task - especially for a system that serves a population of over a half million people through two 9-1-1 communications centers, dozens of medical first responder organizations, and three ambulance services transporting patients to 4 acute care hospitals. To do it well requires support and cooperation. For that, I have many people and organizations to thank.

The KCEMS Medical Director, Dr. Todd Chassee, has been a staunch supporter of this project and the objectives it is trying to achieve. His encouragement was unwavering throughout the entire process. Damon Obiden, the QI Coordinator for KCEMS, was a source of insight and counsel on too many fronts to mention.

The Urban Metro Mayors and Managers (UMMM) recognized the need for this study and provided a venue for the study to be proposed and supported by its member cities. They pointed me towards Daryl Delabbio, the Kent County Administrator, who provided valued counsel and access to County resources.

At the City of Grand Rapids, Deputy Administrator Eric DeLong provided strong early support and guidance for the project, to include garnering support from his colleagues at UMMM to support the study. Fire Chief Laura Knapp was also an early advocate for the study and provided access to members of her staff to help make it happen.

A key figure in the process of making this study happen was Rich Houtteman, Deputy Administrator for the City of Kentwood. He served as the primary point of contact with UMMM and was a frequent advisor on a whole host of issues that came up along the way.

Chief Bob Austin at the Wyoming Fire Department was invaluable in working with MFR departments to provide the information necessary for some of the financial analyses.

Mark Meijer, Matt McConnon, and Dale Feldhauser were extremely helpful in getting the information needed to develop an aggregate picture, past and present, for ambulance service in Kent County.

The yeoman's work to perform all of the GIS analyses that appear in this document (and a considerable amount background work that is not included in the document) was completed by Joe Bennett, GIS Supervisor for the City of Grand Rapids.

A significant debt of gratitude goes to Brad Brown, Strategic Planning Officer; Rob Pease, Strategic Planning Officer; and Rich Morningstar, Firefighter – all from the Grand Rapids Fire Department. They understood the significance of this work in shaping the future of EMS in this community. Brad and Rob provided a huge contribution of time and energy in collecting and organizing data. Rich did an outstanding job of prying raw data out of some of those fire department records management systems to get the information we needed.

Most of all, I'd like to thank the Governing Board and Executive Committee of Kent County EMS for the opportunity learn more about this EMS system and entrusting me with the responsibility of observing, analyzing, critiquing, and trying to outline a path forward.

I'm sure there will be differences of opinion in how I have interpreted the information and in what I have suggested. I hope people know that I have tried to meet this challenge with care, sensitivity, and objectivity.

It isn't very often that an EMS system has the opportunity to explore, consider options, and fundamentally change the 'DNA' that drives how it functions. I'm looking forward to what follows as the community engages in dialog to take a fresh look at their EMS system and chart a path that will lead to measurably improved efficiency and demonstrably better care for the patients and community we serve.

Mic Gunderson
President
Integral Performance Solutions, LLC
November, 2011

1 INTRODUCTION

In July of 2010, Kent County Emergency Medical Services (KCEMS; the State-designated quasi-governmental ‘medical control authority’ that oversees EMS in Kent County) engaged an EMS consulting firm, Integral Performance Solutions (IPS), to provide an assessment and offer recommendations on ways to improve the medical control authority (MCA) and the services it provides. Findings and recommendations were provided in November 2010. A copy of the 2010 report is provided in the appendix of this document and should be considered a part of this study. Where this document is redundant on topics addressed in the 2010 report, this report should be considered to supersede.

Subsequent to the 2010 study, IPS was engaged to provide interim Executive Director services to help begin implementation of those recommendations. IPS assigned the lead consultant on the 2010 study, IPS President Mic Gunderson, to serve in the interim Executive Director role starting in January 2011.

In February 2011, representatives from the Urban Metro Mayors and Managers (UMMM)¹ engaged in discussions with representatives from KCEMS to learn more about the local EMS system. An EMS system study was needed to answer many of their questions. They were told that this was something that KCEMS had intended to do, per the 2010 report. UMMM agreed to support an EMS system study by helping to secure the cooperation of the municipalities in gathering data and providing any technical support needed for the project.

Mr. Gunderson has broad experience conducting EMS system evaluations. He agreed to conduct the EMS system study as a part of his duties as the interim Executive Director rather than seeking a separate contract for the study through IPS. This allowed the study to be conducted at no additional charge to KCEMS or the municipalities while minimizing potential bias given his status as a consultant. To provide the same level of independent perspective in the EMS system study that a reputable external consultant should bring, Mr. Gunderson did not engage ‘insiders’ to perform any aspect of the evaluation, to include KCEMS staff members (i.e., the EMS Medical Director and Quality Improvement Coordinator).² Assistance in data collection was obtained from local fire department staff. Assistance in geographical information system (GIS) analysis was provided by staff from the City of Grand Rapids.

Soon after the decision to conduct the study was made, Kent County Government was also contacted and agreed to support the study. This was intended to provide representation for areas inside the County but outside the municipalities that were members of UMMM.

The project officially began in May of 2011 with an initial meeting of an EMS Study Steering Committee. It consisted of representatives from the following stakeholder groups:

- Hospitals
 - Metro Hospital
 - Saint Mary’s Health Care
 - Spectrum Health
- Ambulance Services

¹ UMMM members represent East Grand Rapids, Grand Rapids, Grandville, Kentwood, Walker and Wyoming

² For disclosure, the KCEMS Executive Committee engaged in negotiations to have Mr. Gunderson become the Executive Director as a full-time employee. He accepted the position in early November, well after most of the study had been completed.

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- American Medical Response
- Life EMS
- Rockford Ambulance
- Medical First Responders
 - Grand Rapids FD
 - Grandville FD
 - Kentwood FD
 - Wyoming FD
- Kent County Government / 9-1-1 PSAPs
 - Kent County Sheriff's Department
- Medical Control Authority
 - Kent County EMS

The overall intent of the study was to:

- initiate dialog among stakeholders on the future direction of the EMS system in Kent County
- frame specific issues that need resolution and offer recommendations
- establish a baseline on the current level of EMS system performance so that progress can be assessed moving forward

***Note:** From this point forward, the report will distinguish between Kent County EMS, the legal name of the quasi-governmental medical control authority in Kent County and the EMS system it oversees. The medical control authority will be referred to as the Kent County Medical Control Authority or KCMCA. The EMS system will be referred to as the Kent County EMS System or KCEMSS.*

2 OVERALL SYSTEM DESIGN AND GOVERNANCE

Findings

- 1) Given the diversity and quality of healthcare organizations, academic institutions and corporations in Kent County, the KCMCA and the KCEMSS potentially have access to most any kind of resource needed to support development of a world-class EMS system – clinically and operationally. There is a strong sense that people in the local EMS community know this – which seems to heighten their disappointment that KCEMSS is so far away from that status.
- 2) The KCMCA is a quasi-governmental regulatory agency³. Along with the other similar organizations in Michigan, called medical control authorities, it is designated as the entity responsible for forging local ‘systems’ of emergency medical care.
 - a) The State of Michigan EMS website says (*emphasis added*) “A Medical Control Authority is an organization designated by the department *for the purpose of supervising and coordinating an emergency medical services system...*”⁴
 - b) Public Health Code Act 368 of 1978, Section 333.20918, paragraph 6 states (*emphasis added*), “Each life support agency and individual licensed under this part is *accountable to the medical control authority in the provision of emergency medical services...*”
 - c) A vision document produced by the KCMCA in 2008 states the mission of KCEMS is (*emphasis added*) “to provide for optimal care for the ill or injured patient through continued *development of an emergency medical services system* in the Kent County Medical Control Region which will include plans for the implementation and provision of: *a coordinated emergency medical services system...*”
 - d) Another planning document from KCMCA states (*emphasis added*), “Kent County Emergency Medical Services is the State-mandated Medical Control Authority that ensures an *excellent system of pre-hospital care by facilitating collaboration and communication with all health care providers.*”
- 3) Undoubtedly, there were many explicit decisions made in the original formation a more formal EMS system for Kent County back in the 70’s. Unfortunately, the ‘design’ does not appear to have been explicitly considered and managed in the decades since. Like most communities, the EMS system ‘evolved’ over time in response to events and circumstances at a municipality and individual provider organization level.
- 4) Emergency and non-emergency ambulance service is provided throughout the County by three providers, without government subsidies.⁵
 - a) Additional details in the system design pertaining to ambulance services are in the ‘Ambulance Services’ section of this report.
- 5) Medical first responder (MFR) services are primarily provided by fire departments along with a community where it is a police department response (Walker); a community with a department

³ A formal statement from the Michigan Attorney General, Mike Cox, Opinion #7165, dated December 27, 2004, opined on the applicability of the Open Meetings Act, MCL 15.261 *et seq.* to Medical Control Authorities (MCAs). In that opinion, the Attorney General concluded, “The Public Health Code authorizes and requires MCAs to make governmental decisions and to take actions to regulate and control the provision of emergency medical services. MCL 333.20919. It is my opinion, therefore, that local medical control authorities are subject to the Open Meetings Act.” On the basis of this statement and other language cited in this report, the KCMCA has been categorized as a quasi-governmental regulatory agency.

⁴ http://www.michigan.gov/mdch/0,1607,7-132-2946_5093_28508-132260--,00.html (last accessed 10Oct11)

⁵ The Grand Rapids Township has voluntarily chosen to provide subsidy to Rockford Ambulance service in return for a specified set of services.

FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011

- of public safety (East Grand Rapids); and a community where a private ambulance service is contracted to provide MFR services (Grand Rapids Township)
- 6) There do not appear to any significant political conflicts between MFRs and ambulance service providers.
 - 7) The State legislation for MCAs places responsibility on the local hospitals for creation of the MCAs. The hospitals in Kent County chose to share oversight and funding responsibility for KCMCA with the ambulance services and medical first responders.
 - 8) Final decision-making is usually made by the KCMCA Executive Committee, which has five voting members. Each of the three hospital groups has one Executive Committee representative – each of which has one vote. The ambulance services, collectively, have one Executive Committee representative with one vote. The medical first responder agencies, collectively, have one Executive Committee representative with one vote.
 - a) The Executive Committee has been delegated the authority to make decisions. It also has the option of making recommendations to the Governing Board for decisions.
 - 9) The Governing Board consists of:
 - a) An administrative, emergency department nursing, and emergency physician representative from each of the three hospital groups, for a total of 9 hospital representatives
 - b) One representative from each of the three ambulance services for a total of 3 ambulance representatives
 - c) Three representatives of participating non-transporting agencies (i.e., MFRs)
 - 10) An EMS Advisory Council is required by State regulation. Currently, it is the same group as the Governing Board.
 - 11) The hospital groups⁶, ambulance services and medical first responder agencies all come under the oversight of the KCMCA. They also operate and fund the KCMCA. Thus, the entities being regulated control the organization that regulates them.
 - a) The hospitals groups have significantly less interest regarding the particulars of KCMCA policies than the ambulances or the MFRs. This is because EMS has a relatively minor impact on a hospital's broad scope of services and financial issues apart from the obvious fact that many of their patients arrive via ambulance. Nonetheless, when hospital groups are empowered to make EMS system policy, they are susceptible to favoring the interests of hospitals over the interests of the EMS system and the overall community (e.g., favorable hospital destination and bypass policies). Their potential conflict of interest is relatively low but should still be recognized. However, their role in the MCA governance is required by State regulation. No such *requirement* exists for ambulance or MFR involvement in MCA governance.
 - i) Under current KCMCA policies, the hospitals collectively cover 75% of the total KCMCA budget through a 'voluntary' financial assessment.
 - b) The 31 MFRs entities have a significant interest in MCA policies, even through most of them are fire departments. It is not unusual for a fire department that provides MFR to have 70-80% of its responses be for medical, rather than fire incidents. Consequently, MCA policies can have a significant operational impact. The financial impact is minimal as evidenced by the small impact of the EMS mission on MFRs from a marginal cost standpoint (details are in the Costs and Value section of this report). Therefore, the magnitude of a potential conflict of interest for MFRs characterized as moderate.
 - i) Under current KCMCA policies, medical first responders collectively cover 10% of the total KCMCA budget through a 'voluntary' financial assessment.

⁶ Hospital are not regulated by KCMCA but EMS related issues and processes, such as hospital diversion and destination policies are under KCMCA's oversight.

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- c) The 3 current ambulance companies have the most at stake in MCA policies.
 - i) The clinical and operational standards and protocols directly impact their costs.
 - ii) MCAs can directly impact the business environment for ambulance services, such as the handling of a request for a new ambulance provider to enter the local ambulance market. There isn't a certificate of public need and necessity or similar process in place with the cities or townships that restricts entry into the ambulance market.
 - iii) Conflicts of interest with ambulance services participating in the governance and funding of the MCA that regulates them may manifest in a wide variety of ways. Unfortunately, even if actions or efforts by the ambulance companies have the best of intentions, the specter of conflicts of interest clouds the issues and motives.
 - d) Under current KCMCA policies, ambulance services collectively cover 15% of the total KCMCA budget through a 'voluntary' financial assessment.
- 12) Michigan's Public Health Code, §333.20948, sub-section (3) states (emphasis added), "A local governmental unit may enact an **ordinance regulating ambulance operations, nontransport prehospital life support operations, or medical first response services**. The standards and procedures established under the ordinance shall not be in conflict with or less stringent than those required under this part or the rules promulgated under this part."
- a) There is a problem in the MCA governance process design where the MCA's are "supervising and coordinating the local EMS system" but the local government entities that can pass "ordinances regulating ambulance operations, nontransport prehospital life support operations, or medical first response services" are not participating in the MCA.
 - b) The MCA may set system policies and standards, but it does not possess any enforcement powers over the provider organization, short of a request for de-certification by the State. MCA enforcement powers are limited to the individual clinical staff member level where local certification to serve as an MFR, EMT, paramedic or emergency medical dispatcher can be restricted or withdrawn for non-compliance. Such enforcement powers at an organizational level rest with the municipalities through ordinance.
 - i) Hence, the KCMCA has the responsibility without corresponding authority. The municipalities have the authority, but are not a part of or effectively connected to the MCA that has the responsibility.

Recommendations

- 1) KCMCA should seek out opportunities to collaborate with local healthcare and academic institutions and businesses to leverage their resources and expertise to support improvements in EMS processes and the overall system of care.
- 2) KCMCA should facilitate dialog among the cities, townships and the County to help them come to informed consensus on key issues in the design of the County-wide EMS system.
 - a) Determine what additional services, if any, may be collectively needed / desired by the communities which leverage the existing EMS system infrastructure.
 - i) Example: Developing EMS and healthcare system processes that might better serve the lower acuity patients who utilize EMS and ED services for chronic care support and/or primary healthcare (e.g., applying community paramedic^{7,8,9} program activities in urban, suburban and rural settings).

⁷ Community Healthcare and Emergency Cooperative - <http://communityparamedic.org> (last accessed 10Oct11)

⁸ International Roundtable on Community Paramedicine - <http://www.ircp.info> (last accessed 10Oct11)

⁹ Misner, D: Community Paramedicine: Part Of An Integrated Healthcare System. EMS World Magazine (<http://www.emsworld.com/article/10324068/community-paramedicine-part-of-an-integrated-healthcare-system>) (last accessed 10 Oct11)

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- b) Municipalities should make explicit allocations of ambulance market rights for specific areas through performance contracts.
 - i) The performance contracts should specify service features, standards and accountabilities.
 - c) Municipalities should make explicit internal policies for MFR service that are functional equivalents of the performance contracts proposed to apply to ambulance services
 - i) The internal policies should specify service features, standards and accountabilities
 - d) Modify the governance and funding structure of KCMCA to:
 - i) Include the municipalities in the governance structure of KCMCA
 - ii) Reduce the real or perceived conflicts of interest in the current KCMCA governance structure
 - iii) Modify the funding process so that the real or perceived conflicts of interest are better insulated from the funding mechanism. This may be accomplished by shifting from voluntary financial support to support that is required through contract or local ordinance.
 - e) Enable enforcement of KCMCA policies, standards and funding mechanisms at an organizational level by linking the municipalities that can enact ordinances regulating EMS providers to the MCA that has regulatory responsibility.
- 3) Proposed MCA governance structure modifications
- a) Board of Directors
 - i) In complete control of the KCMCA, but has stakeholder input through stakeholder and medical advisory boards.
 - ii) Voting Board members include
 - (1) 3 representatives – 1 from each of the hospital groups (may be the administrator, nurse or emergency physician representative). Should another group with an acute care receiving hospital come into the community, they would also be given a seat on the Executive Board.
 - (2) 1 representative from the cities
 - (3) 1 representative from the townships
 - iii) The President of the Board would be either the city or township representative, perhaps on a rotating basis. This is intended to balance power with the hospitals.
 - iv) Non-voting members
 - (1) KCMCA Medical Director
 - (2) KCMCA Executive Director
 - b) EMS Advisory Council – Provides a venue for collaboration and communication between stakeholders and the KCMCA Board
 - i) Chaired by the President of the Board
 - ii) 3 ambulance representatives - 1 from each of the ambulance services. Should another ambulance service come into the community they would also be given a seat on the Advisory Board.
 - iii) 3 MFR representatives, chosen from among all of the MFR provider agencies by the Kent County Fire Chief's Council
 - (1) Can include appointment of non-FD MFR provider organization representatives
 - iv) 3 emergency nurse representatives – 1 from each of the 3 hospital groups. Should another group with an acute care receiving hospital come into the community, they would be asked to appoint an emergency nurse to the Advisory Board.
 - v) 3 hospital administration representatives – 1 from each of the 3 hospital groups. Should another group with an acute care receiving hospital come into the community, they would be asked to appoint an administration-level representative to the EMS Advisory Council.

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- vi) Non-voting members
 - (1) KCMCA Medical Director
 - (2) KCMCA Executive Director
- c) Medical Advisory Board
 - i) Chaired by the KCMCA Medical Director
 - (1) Vote is withdrawn in the event of a tie.
 - ii) 3 emergency physician representatives – 1 from each of the 3 hospital groups. Should another group with an acute care receiving hospital come into the community, they would be asked to appoint an emergency physician to the Medical Advisory Board.
 - iii) May be called upon by the Board of Directors to:
 - (1) Review KCMCA Medical Director performance (KCMCA Medical Director would be recused)
 - (2) Make recommendations when filling an opening for the KCMCA Medical Director position
 - (3) Make recommendations on clinical policies and procedures
- d) Specialty Advisory Panels
 - i) To provide input to the Medical Advisory Board on policies and procedures pertaining to their specialty area
 - ii) To facilitate collaboration between hospitals and the EMS system on developing systems of care pertaining to their specialty area
 - iii) To include 1 representative for each specialty that has a Specialty Advisory Panel
 - iv) Recommend starting with trauma and cardiology
 - (1) Cardiology Advisory Panel
 - (a) 3 cardiologist representatives– 1 from each of the 3 hospital groups. Should another group with an acute care receiving hospital come into the community, they would be asked to appoint a cardiologist to the Cardiology Advisory Panel.
 - (2) Trauma Advisory Panel
 - (a) 3 surgeon representatives– 1 from each of the 3 hospital groups. Should another group with an acute care receiving hospital come into the community, they would be asked to appoint a surgeon to the Trauma Advisory Panel.
- 4) Develop ‘system’ and provider agency participation and performance standards
 - a) Establish response interval and associated compliance level standards for the different providers on the various types of calls, based on clinical / safety needs; financial constraints; and community expectations / desires in context of clinical and financial considerations.
 - i) Consider conducting community focus groups to examine community expectations in context of clinical and financial considerations
 - (1) Seek collaboration of a business school, local business, or political polling service with appropriate expertise to assist in this project
 - ii) Key concepts and guiding principles regarding public safety answering point (PSAP), MFR and ambulance response time interval standards are in other sections of this document.
 - b) Develop policies, processes and infrastructure to measure, monitor, verify data and enforce performance standards.
 - c) The authority for enforcement by KCMCA performance standards should be established through two mechanisms:
 - i) via delegated authority from the municipalities, to set requirements for the EMS providers that serve their communities
 - ii) via State-approved protocols as established MCL §333.20919 & Rule 210.
- 5) KCMCA should lead system-level strategic planning and then help support implementation efforts by the providers and other participants.

3 COSTS AND VALUE

The purpose of the cost and value analysis was to 1) establish a baseline for costs at a system level so that changes may be tracked over time; and 2) measure the system level costs in context of quality metrics to derive value, which can also establish a baseline that can be tracked over time.

The costs associated with EMS in Kent County were considered in the following categories:

- Public Safety Answering Point (PSAP) Services;
- Medical First Responder (MFR) Services;
- Ambulance Services; and
- Medical Control Authority Services

Costs from these four components were aggregated to derive overall system costs. System costs were then combined with quality metrics to calculate value. For all cost estimates and calculations, calendar year 2010 or the closest applicable fiscal year data was used.

Marginal cost calculations were used for PSAPs and MFRs. Marginal costs were determined by asking each chief of the MFR provider organizations to estimate what costs, if any, would be eliminated if their organization no longer responded to medical calls. The PSAP managers were similarly asked what costs, if any, would be eliminated if they no longer dispatched medical calls. Data provided in response to the request were accepted at face value.

Financial data was not available from the following MFR providers: Cutlerville, Dutton, Lowell, Solon, and Spencer. These departments account for approximately 18% of the total MFR call volume in Kent County.

Ambulance service costs were calculated by asking the providers to take each of their CY 2010 operating budgets and divide it by the total number of ambulance hours that their companies provided in CY 2010 to derive a 'fully-loaded' unit hour cost. That fully-loaded unit hour cost was then multiplied by the number of unit hours that were actually deployed in Kent County in CY 2010. This allowed each ambulance service to appropriately allocate costs to their Kent County activities even though their internal accounting systems may blend costs with communities outside of Kent County.

There were some sensitivities among the ambulance service providers in sharing their proprietary cost data. A compromise was reached that allowed the cost information to be used, but not disclosed. Data provided in response to the requests were accepted at face value.

For the medical control services calculation, the amount charged by the KCMCA to the hospitals, ambulance services and MFRs to cover its FY 2010-11 operating budget were used. The ambulance service funding was removed as it is included in their operating costs. The expenses of each MFR towards financial support of KCMCA were extracted from their individual calculations. The total MFR contributions via their financial assessments per KCMCA records were used.

The overall annual EMS system cost for 2010 in Kent County, as determined by the processes described above, was \$19,933,773.55. Dividing the total system cost for CY 2010 by the population in Kent County for 2010 (602,622¹⁰) yields an EMS cost per capita of \$33.08.

¹⁰ http://2010.census.gov/news/xls/cb11cn106_mi_2010redistr.xls (last accessed 10Oct11)

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

A value quotient quantifies the relationship between benefits and costs by considering how much was spent to achieve a given quality or performance benefit.¹¹

Unfortunately, the EMS system in Kent County only has one clinical performance outcome metric that is measured on a system-wide basis - the survival rate from out-of-hospital cardiac arrest. The KCMCA coordinated an effort with each of the hospitals and ambulance services to participate in a national cardiac arrest registry sponsored by the Centers for Disease Control (CDC) in conjunction with Emory University and the American Heart Association.¹² Data collection for this effort began in April 2010. Using the first 12 months of data (April 1, 2010 through March 31, 2011), the system had a survival to hospital discharge rate of 37.3% (using the 'Utstein Survivor' category).¹³ The system spent \$33.08 per capita on EMS in CY 2010, which funded the effort that achieved the Utstein survival rate of 37.3%. Thus, the 2010 Utstein cardiac arrest survival rate value quotient was 1.13 (calculated as 37.3/33.08).

As a part of the effort to establish a baseline, a value quotient based on response interval performance and EMS cost should be calculated. However, there are some important limitations in both the MFR and ambulance service response interval data analysis in this study that need to be resolved first. These limitations are explained in detail in the Response Intervals section of this report. Once the data limitation issues are resolved, it will be possible to calculate the a system-level response interval (begins at the time an emergency call was received at the 9-1-1 PSAP until the first arriving EMS unit [MFR or ambulance] arrived at the address of the incident). That may be considered in context of how much was spent on EMS in Kent County as system response interval value quotient (System response interval / EMS cost per capita). This metric will important for the community to track in gauging the value they are receiving from the system response process over time.

¹¹ Gunderson M: The Value Quotient: Looking at the Combined Effects of Quality and Cost. Journal of Emergency Medical Services. February 2009, pg 30.

¹² Cardiac Arrest Registry to Enhance Survival (CARES). <http://www.cdc.gov/dhdsp/cares.htm> (last accessed 07Oct11)

¹³ International Liaison Committee on Resuscitation: Cardiac arrest and cardiopulmonary resuscitation outcome reports: update and simplification of the Utstein templates for resuscitation registries. Resuscitation 63 (2004) 233–249.

4 DISPATCH SERVICES

Findings

- 1) Marginal costs for delivery of EMS related dispatch services at the two PSAPs, one by the City of Grand Rapids and the other by Kent County Sherriff's Office, were estimated for CY 2010. The estimation was made by asking the 9-1-1 communication center managers to consider what costs in their operations would be eliminated or reduced if they did not dispatch MFRs.
- 2) In both PSAPs centers, mangers were unable to identify any specific costs that would be eliminated or reduced if MFR dispatch services were no longer provided by their agencies. Presumably, the same equipment, software, and personnel would be needed with or without the responsibility of dispatching of MFRs. Their estimates of marginal costs were accepted at face value.
- 3) It is reported that the future budget for the 9-1-1 PSAPs has already been established and taxing mechanisms and rates are already in place with the assumption that emergency medical dispatch (EMD)¹⁴ services on all 9-1-1 medical calls will be provided by the PSAPs.
- 4) Currently, EMD services on 9-1-1 medical calls are provided by the ambulance service in whose territory the call originates or by the ambulance service that the caller requests.
- 5) The ambulance services also provide EMD services for calls received on their respective seven digit lines. These seven digit lines are intended for non-emergency calls, but some of those calls actually end up being triaged as emergencies.
- 6) Only one ambulance service (Life EMS) has the technical capability of receiving an electronic transfer of the caller's automatic telephone number information (ANI) and automated location information (ALI) on a call transferred to it for EMD services from either of the PSAPs.
- 7) Only one of the ambulance services (Life EMS) uses the computerized tool for guidance for the triage and pre-arrival instructions process (Pro-QA) and the tool for computerized management of the quality assurance process (AQUA). These computerized tools are preferable to the manual processes that have to be used in lieu of Pro-QA and AQUA.
- 8) If an ambulance service receives a call from a PSAP or via its 7 digit direct phone line, it has the option to respond to the call itself regardless of the ambulance service territory that the call is located in.
- 9) Given the lack of involvement by most municipalities in making formal and explicit territory designations and rules for ambulance service providers, there are on-going disputes and counter-productive dynamics between the incumbent ambulance services. This creates the potential for many types of unintended potential scenarios that begin at the dispatch level which can detract from high quality patient care, decrease economic efficiency and create public safety risks.

Examples include:

- a) When a 9-1-1 caller asks for an EMS response, they can ask for whatever ambulance service they want, regardless of the ambulance territory lines. The PSAP will transfer the call to the specified ambulance service and that service can respond its own ambulance, so long as the ambulance arrives within the KCMCA specified time frame. Unfortunately, if it took longer than the KCMCA time frame, any harm from the delay has already occurred. If that happened to be a call for an extremely time sensitive medical condition (e.g., cardiac arrest), the harm may be significant and the harm may still occur if the response takes longer than would have otherwise been possible despite still being within the KCMCA standard. For less

¹⁴ EMD triages the call for severity and provides pre-arrival instructions to initiate care before MFR units or ambulances arrive. More info: www.911dispatch.com/info/emd/index.html and www.naemd.org

FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011

- time sensitive medical conditions, there is probably little or no consequence of several minutes of delay from a clinical outcome standpoint (see the section on *Response Intervals* for more detail on this issue).
- b) Calls originating in the Rockford Ambulance service area are handled a bit differently, presumably because of the large rural area it covers. If a 9-1-1 call originates in the Rockford service area, the other ambulance services are supposed to turn the call over to Rockford even if the caller requested a different service. If the caller insists on having the ambulance service they requested make the response into Rockford's service area, that ambulance service may continue their responding unit as well. It will be up to the patient to decide which service will make the transport when the time comes to place the patient into an ambulance.
 - c) When a caller asks for an EMS response via an ambulance service's 7 digit direct telephone line, they can have that ambulance service respond, regardless of the ambulance territory lines and regardless if the call triages as an emergency or not. Unfortunately, if it takes longer than the KCMCA time frame to arrive, any harm from the delay has already occurred. If that happened to be a call for an extremely time sensitive medical condition (e.g., cardiac arrest), the harm may be significant. For less time sensitive medical conditions, there is probably little or no consequence of several minutes of delay from a clinical outcome standpoint (see the section on *Response Intervals* for more detail on this issue).
 - d) Because caller's can override the ambulance service territory lines, it creates an incentive for ambulance services to promote their 7 digit line and ambulance subscription programs to, in effect, bypass the 9-1-1 system.
 - e) An ambulance service may receive a call for a location outside of its designated territory and it will send its own unit as well as notifying the other ambulance service that covers the call location.
 - i) Now two ambulances are responding to the same call, increasing the risk of emergency vehicle or wake effect crashes.^{15,16}
 - ii) It also decreases ambulance service coverage across the community, thereby requiring a most distant ambulance to respond. It is not uncommon in Kent County for an ambulance service to have no units immediately available when a 9-1-1 call is received – and having two units responding to the same call exacerbates the problem.
 - iii) Having two units unnecessarily responding to the same call can lead to unfortunate clinical consequences if having the second unit responding to the same call results in a longer response interval to an overlapping call for a time-sensitive medical condition (e.g., cardiac arrest).
 - iv) A policy that unnecessarily sends two ambulances to the same call requires additional ambulances to be deployed to allow for 9-1-1 responses outside territory lines – with less operational efficiency and higher resulting costs to the ambulance services, which creates an upward pressure on ambulance rates.
 - f) To the credit of the current ambulance service managers, some of the potential problems cited above are avoided by practices of their own accord that will give a call to a competitor if there is a presumably time sensitive problem and the competitor can possibly arrive

¹⁵ Clawson JJ, Martin RL, Cady GA, Maio RF: The wake-effect--emergency vehicle-related collisions. *Prehosp Disaster Med.* 1997 Oct-Dec;12(4):274-7. Online at <http://www.naemd.org/articles/wakeeffect1.htm> (last accessed 06Oct11)

¹⁶ Custalow CB, Gravitz CS: Emergency medical vehicle collisions and potential for preventive intervention. *Prehosp Emerg Care.* 2004 Apr-Jun;8(2):175-84.

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

sooner. Because this entire process is unmonitored, how often or how reliably that happens is unknown.

Recommendations

- 1) There are advantages and disadvantages to shifting the responsibility for EMD on 9-1-1 calls to the PSAPs.
 - a) The principal positive is that it would reduce or eliminate some of the potential problems associated cited above with EMD at the ambulance communications centers.
 - b) The principal negative is that it will take time for the PSAPs to develop the skills and experience needed to provide EMD at a level even close to equivalent to what the ambulance EMDs do already. During that transition, there is a increased risk of inexperienced PSAP staff mishandling triage and pre-arrival instructions – which can directly and severely impact patients.
 - c) Financially, it seems that PSAP budgets and tax rates have already anticipated delivery of EMD at the PSAPs. PSAP related tax rollbacks are unlikely if EMD stays at the ambulance services.
 - d) Therefore, it is recommended that EMD be shifted to the PSAP contingent upon the following:
 - i) A plan be submitted to the KCMCA and the Kent County Dispatch Authority that shows how the training / quality control risks described above will be mitigated. The plan should establish a commitment to those plans and propose consequences for failure to meet those commitments. This plan should be approved before any EMD transition efforts move forward.
 - (1) On a temporary basis until EMD quality review skills can be developed internally, the PSAPs should consider outsourcing EMD quality review to one of the ambulance companies that have International Academy of Emergency Dispatch (IAED) certified EMD-Q staff members. Alternatively, EMD-Q may be outsourced to the ‘National Q’ service offered by Priority Dispatch Consultants.¹⁷
 - ii) A plan be submitted to the KCMCA and the Kent County Dispatch Authority that shows how the respective PSAPs plan to obtain IAED accreditation within a defined time frame. The plan should establish a commitment to that goal and propose consequences for failure to meet those commitments. This plan should be approved before any EMD transition efforts move forward.
- 2) Given that the ambulance companies will still need to provide EMD on their 7 digit calls, all ambulance communication centers should also be required to obtain and maintain accreditation by the International Academies for Emergency Dispatch. Each ambulance service should submit a plan and timetable for reaching that goal. The plans should establish a commitment to that goal and propose consequences for failure to meet those commitments.
- 3) All EMD, for all calls (9-1-1 and 7 digit) at all PSAPs and ambulance communications centers, should be using the same computerized software tools for emergency medical dispatching - Pro-QA and AQUA.
- 4) Establish performance standards for dispatch time interval performance on 9-1-1 calls. The following are suggested starting points for discussion on such standards and are based on NFPA Standard #1221¹⁸:

¹⁷ http://www.prioritydispatch.net/nationalq_home.php; http://www.prioritydispatch.net/nationalq_services.php (Last accessed 07Oct11)

¹⁸ National Fire Protection Association 1221 Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems. 2002 Edition. <http://www.nfpa.org/assets/files/PDF/1221.pdf> (last accessed 20Oct11)

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- a) 9-1-1 PSAP Initial Call Processing Interval should not exceed 45 seconds with at least 95% reliability (i.e., 9-1-1 first ring to call transfer to emergency medical dispatcher at ambulance dispatch center). This is based on NFPA Standard 1221, which states:
 - i) “NFPA 6.4.2* Ninety-five percent of alarms shall be answered within **15 seconds**, and 99 percent of alarms shall be answered within 40 seconds”
 - ii) “NFPA 6.4.5 Where alarms are transferred from the public safety answering point (PSAP), the transfer procedure shall not exceed **30 seconds** for 95 percent of all alarms processed.”
- b) For the process now in place, where EMD is provided at the ambulance communications center, the secondary call processing interval should not exceed 60 seconds with at least 95% reliability (i.e., emergency medical dispatcher call received to ambulance and fire unit notification). This is based on NFPA Standard 1221, which states:
 - i) “6.4.3 Ninety-five percent of emergency dispatching shall be completed within **60 seconds**.”
- 5) All PSAPs and ambulance communication centers should have the capability to do electronic call transfers of ANI/ALI data along with other call information to any other PSAP or ambulance communications center.
- 6) All dispatchers in positions that provide, or have the potential to provide, EMD should be required to have IAED certification.
- 7) All PSAPs and ambulance communications center CAD systems should be time synchronized so that any variance does not exceed 5 seconds from Coordinated Universal Time (UTC)¹⁹
- 8) The initial call processing by the PSAP to determine if a call is ‘medical’ and all EMD processes should be subject to medical oversight by the KCMCA.
- 9) KCMCA should have access to all 9-1-1 and 7 digit direct telephone call recordings for quality improvement and complaint investigation.
- 10) KCMCA should have direct access to all CAD data for quality improvement, complaint investigation and independent verification of data used by PSAPs and ambulance provider agencies to generate reports requested by KCMCA.
- 11) Ambulance territory lines, established by the municipalities, should determine which ambulance service receives a 9-1-1 call that triages as an emergency response. For 9-1-1 calls that do not triage for emergency response, ambulance preferences stated by the caller may be honored.
 - a) The criteria for which calls are appropriate for an emergency response should be revisited by KCMCA and then applied to the entire set of EMD determinants. This process should provide opportunities for input from the MFRs, ambulance providers, and PSAPs.
 - b) If a call triages as an Echo or meets other criteria for extremely time sensitive emergency as determined by KCMCA protocol or policy, closest unit response policies based on GPS data should prevail, regardless of jurisdictional lines.
 - c) On a call that triages for an emergency response, if a caller requests an ambulance service that is different than what their location designates, the caller should be informed of that and that upon request, their preferred ambulance service will be notified of the request by the PSAP. The designated ambulance service for that area will be given the call. It will then be up to the requested ambulance service to contact the caller to see if they would still like them to respond. Under no circumstances should ambulance dispatch be delayed.
- 12) The PSAPs should be subject to service specifications and performance standards that are established in collaboration with KCMCA and supported by internal policies that seek to approximate performance contract provisions. They may include:
 - a) Dispatch response interval requirements

¹⁹ <http://www.usno.navy.mil/USNO/time/master-clock>

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- b) Data submission and reporting requirements
- c) Data co-ownership clauses for medical calls (between the PSAP and KCMCA)
- d) Quality management program requirements
- e) System-level quality improvement and research project participation requirements
- f) Real-time linkage to the MFR and ambulance unit GPS location data feedsto facilitate closest unit response to time sensitive cases
- g) KCMCA financial support and indemnification requirements
- h) Performance assurance / accountability requirements
 - i) Fines for failure to meet service or performance specifications (e.g. minor response interval non-compliance issues; Late or incomplete data or reporting submissions)
 - (1) These may used as offsets to the portion of the KCMCA budget that the municipalities cover via MFR financial assessments from KCMCA.
 - ii) Regular public reporting of key performance metrics established by KCMCA in collaboration with the municipalities.

5 MFR SERVICES

Findings

- 1) Fire departments provide a variety of services on 9-1-1 EMS calls independent of their EMS role. These services include firefighting, hazard mitigation, automobile crash extrication and other types of ‘technical’ rescue operations. These are referred to as *Fire* First Response (FFR) services (in contrast to *Medical* First Response or MFR).
- 2) MFR provider agencies provide a basic life support (BLS) level of care, primarily with personnel certified at the MFR level.
- 3) Evidence of formal quality management systems to review and improve EMS care was not found in any of the MFR services.
- 4) In response to a survey soliciting estimation of marginal EMS costs, MFR department chiefs report very low marginal costs (see section on ‘Costs and Value’ in this document for more details).
 - a) Most MFR department chiefs indicated that if MFR services were no longer provided, there would not be any significant staffing reductions, despite the fact that MFR responses represent approximately 3/4^{ths} of their call volume.
 - i) This is presumably due to the need for the same levels of staffing and apparatus to maintain the current levels of fire protection and ISO ratings.
 - ii) Some city managers have expressed a contrary opinion – that fire department costs could be significantly decreased if the MFR services were no longer provided and that those reductions would not significantly impact their ISO ratings.
- 5) Beyond a relatively broad requirement that MFRs respond on calls classified as Med 1 or 2, there has not been a specific review of MFR response policies to determine which calls have scientific evidence that demonstrates or strongly suggests clinical benefit from MFR response so that policies may be adjusted accordingly.
- 6) Policies, or use thereof, seem to be lacking for MFR units to appropriately upgrade, downgrade and cancel ambulances that are still responding to a scene.
- 7) Some cities (Grand Rapids, Kentwood and Wyoming in particular) are considering consolidation of fire department services in an effort to achieve some economies of scale and thereby decrease total costs.

Recommendations

- 1) BLS is an appropriate clinical service level for the departments that currently provide MFR services. Upgrading to Advanced Life Support (ALS) is not recommended. It adds significant cost without significant demonstrable benefit, particularly for the limited time interval between MFR and ALS ambulance arrival.
- 2) Continuing to provide MFR services is strongly recommended for local fire and police departments, based on the premises outlined below.
 - a) There is a presumption of net cost savings to individual homeowners and businesses when enough fire stations are built to put their properties into reasonable proximity of a fire station. If the fire stations are fewer and therefore more distant, the presumption is that fire insurance premiums would be higher than the taxes needed to establish and operate additional fire stations. In most communities, this results in more fire stations than would be justified by the fire call volume alone. The validity of this presumption was not evaluated but it may differ between municipalities.

FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011

- b) Given the large number of fire stations and their strategic proximity to homes and businesses, fire stations are often closer to the scene of a medical emergency than the closest available ambulance.
 - c) Fires have become relatively infrequent events, leaving time available between fire calls for fire crews to respond to medical emergencies without significantly compromising their fire suppression role.
 - d) Police patrol cars may also happen to be closer than ambulances for any given call.
 - (1) Communities with, or contemplating, police department MFR should consider if there is adequate time available to layer in an MFR role onto the number of police units that would be deployed to just serve their primary law enforcement mission.
 - e) Some, but not all, medical emergency outcomes are improved by having appropriately-trained personnel on scene sooner rather than later.
 - f) Fire and police personnel, vehicles, stations, and other infrastructure for their primary mission have already been paid for by the community. Adding an EMS mission to the fire or police department can be very economical if these existing resources can also be used to respond to EMS calls, particularly when the added expense is limited to the following: cost of additional medical training; salary increases justified by added call volume and medical certification requirements; additional medical equipment; medical supplies; and the added cost of fuel, maintenance, etc. for going on the medical calls.
 - i) If new vehicles and staff have to be added to provide MFR, it may then be more economical to consider alternatives, such as privatized MFR, which may have lower cost structures than public agencies with generally more expensive personnel costs.
 - ii) In communities with low to moderate fire or police call volume, adding the EMS mission onto the fire or police departments allows those resources to be leveraged to serve their community's EMS needs without significant added expense or compromise to their fire or police missions.
- 3) There is an opportunity to significantly reduce the number of calls that MFR units respond to while protecting the interests of patients.
- a) MFR should be sent on calls that meet any of these criteria:
 - i) Cases which require *fire or police* first response services (e.g., fire protection; traffic control at a motor vehicle crash)
 - ii) Cases where extrication and/or technical rescue services are needed (for fire-based MFR)
 - iii) Cases where additional manpower is likely to be needed (e.g., more complicated medical cases; potentially violent scenes; bariatric patients)
 - iv) Extremely time critical cases (e.g., cardiac arrest; complete airway obstruction)
 - v) Cases where any delay of EMS personnel might pose a risk to the patient or others (e.g., patient exposed to vehicle traffic; environmental exposure to weather extremes)
 - vi) At the request of the ambulance crew. On cases where MFR is not initially deployed, the ambulance crew should always have the option to request MFR as appropriate.
 - b) Limiting MFR to a smaller set of cases should be approached carefully in order to reasonably reduce the potential for under-triage.
 - c) A smaller set of cases for response will also increase the likelihood of an MFR unit being available for calls in their own district, thereby decreasing 'second due' unit responses and decreasing MFR response intervals.
- 4) Training and policies should be developed for the first crew on-scene (regardless if MFR or ambulance) to appropriately upgrade, downgrade and cancel ambulances still responding to a scene.

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- 5) The MFRs should be subject to service specifications and performance standards that are established in collaboration with KCMCA and supported by internal policies that seek to approximate performance contract provisions. They may include:
- a) Response interval requirements
 - b) Data submission and reporting requirements
 - c) Data co-ownership clauses (between the MFR and KCMCA)
 - d) Quality management program requirements
 - e) System-level quality improvement and research project participation requirements
 - f) Real-time GPS MFR unit location data feeds to the PSAPs to facilitate closest unit response to time sensitive cases
 - g) Mutual aid requirements
 - h) KCMCA financial support and indemnification requirements
 - i) Performance assurance / accountability requirements
 - i) Fines for failure to meet service or performance specifications (e.g. minor response interval non-compliance issues; Late or incomplete data or reporting submissions)
 - (1) These may used as offsets to the portion of the KCMCA budget that the MFRs collectively cover through their annual KCMCA financial assessments.
 - ii) Regular public reporting of key performance metrics established by KCMCA in collaboration with the municipalities.

6 AMBULANCE SERVICES

Findings

- 1) Piecing together information from several sources, it seems that a group of city and township leaders informally met as the Association of Grand Rapids Area Governments; AGRAG) in the early 1980's to discuss issues of mutual interest. A set of ambulance service territory lines for 9-1-1 responses were apparently agreed upon at that time between municipal participants and the then incumbent ambulance service providers. Those territory lines may have built upon agreements that were originally established in the early 70's.
- 2) There are no territories for non-emergency inter-facility medical transportation calls (e.g., scheduled transports of patients between hospitals or nursing homes received via ambulance service 7 digit telephone lines).
- 3) As a result of 9-1-1 ambulance territory disputes, KCMCA facilitated a process to attempt to resolve those conflicts. At that time, there were concerted but unsuccessful efforts in 2009 to find documentation from the 70's or 80's for the ambulance territory agreements, the scope of city and township representation in the process, and maps of the ambulance territory lines. Unable to find such documentation, there was a re-creation of the ambulance territory lines to coincide as much as possible with the group's collective recall. The map of the ambulance territory lines for 9-1-1 responses that was agreed upon by the ambulance service representatives in 2009 is shown in Figure 1.

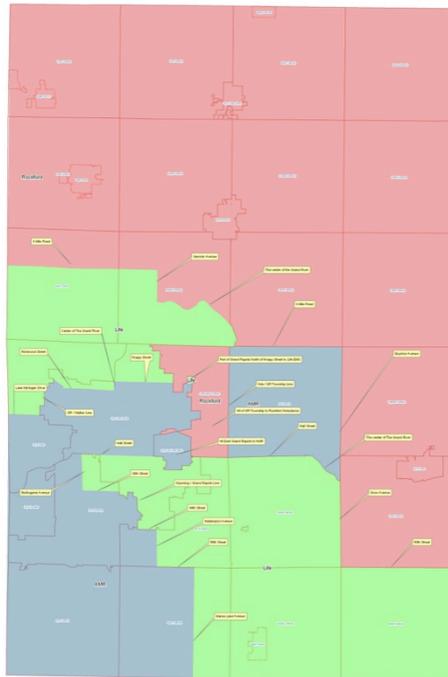


Figure 1 – Current ambulance service territories for 9-1-1 responses, as agreed upon in 2009.
(Pink = Rockford Ambulance; Green = Life EMS; Grey = AMR)

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- 4) The following municipalities, effective on or near the dates listed, had formally specified Rockford Ambulance as their designated emergency ambulance provider. The documentation for these agreements did not specify any sort of performance requirements, other than stated or implied coverage on a 24/7 basis:
 - a) Algoma Township – September 12, 2000
 - b) Cannon Township – April 6, 1980
 - c) Courtland Township – May 5, 1980 (probable date – date on document is ambiguous)
 - d) Grand Rapids Township – January 24, 2008
 - e) City of Lowell – September 7, 1993
 - f) Nelson Township – May 5, 1980
 - g) Oakfield Township – May 16, 1980
 - h) Plainfield Township – May 8, 1980 (with specific boundaries)
 - i) City of Rockford – April 1, 2001
 - j) Spencer Township – July 23, 1980
 - k) Solon Township – June 12, 2001
 - l) Vergennes Township – August 11, 1988
- 5) The municipalities have not been involved in setting or approving ambulance service performance standards or fees for their communities.
- 6) Given the general lack of formal and explicit territory designations and rules for ambulance service providers in most municipalities, there are counter-productive dynamics between the three incumbent ambulance services over territory issues and allowable exceptions to the agreed upon territory lines. This can lead to many unfortunate scenarios that can detract from high quality patient care, decrease economic and operational efficiencies, and create public safety risks. This issue is examined in more detail in the Dispatch Services section of this document.
- 7) Establishing policies and processes to send the closest available ambulance for the benefit of patients with extremely time sensitive medical conditions (i.e., cardiac arrest) is discussed in the ‘Response Intervals’ section of this report. However, under the current agreements, this well-intentioned action has the potential to further undermine ambulance service territory designations by creating an incentive for ambulance providers to position their ambulances in each other’s designated 9-1-1 territories in an effort to be the closest unit in areas with the highest probability for calls. This increases the risk for emergency vehicle crashes as ambulances *compete* to arrive first. It may also lead to a significant mal-distribution of ambulances resulting in longer response intervals to outlying areas. This scenario would be extremely counter productive and potentially dangerous.
- 8) Emergency and non-emergency ambulance service is provided throughout the County, without government subsidies.²⁰ This is a very positive finding.

Recommendations

- 1) The municipalities should be given a specific opportunity to make explicit and well informed choices on the ambulance provider(s) that serve their communities.
 - a) In order to preserve the current arrangement where emergency ambulance service is provided throughout the County without government subsidy, the municipalities should work collectively in choosing ambulance provider(s) so that the resulting territory(ies) have contiguous service areas with enough call volume to be economically viable.
 - i) It should be noted that if the municipalities in the more densely populated core of the County create their own ambulance territory separate from the outlying areas with lower

²⁰ Grand Rapids Township has voluntarily chosen to provide subsidy to Rockford Ambulance services in return for higher service levels that include a dedicated ambulance and an SUV that is used as an MFR response vehicle.

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- population density, it may result in a need for ambulance subsidies to serve the outlying areas. If ALL of the municipalities work together, ALL of the municipalities can preserve availability of subsidy-free ambulance services.
- 2) The explicit designation of ambulance service providers should be codified in performance contracts. The contracts should include minimum service specifications, performance standards, accountabilities, and rate regulations.
- a) Rate regulations are important to address when serving the best interests of the public leads to a decision that restricts retail choice (e.g., designating a specific ambulance provider). In such cases, the municipalities should recognize the need to take additional steps to protect the public's interests through rate regulation and quality / performance standards.
 - b) The service specifications and performance standards should be established in collaboration with KCMCA, the state-designated entity responsible for EMS system oversight. They may include:
 - i) Response interval requirements
 - ii) Data submission and reporting requirements
 - iii) Data co-ownership clauses
 - iv) Quality management program requirements
 - v) System-level quality improvement and research project participation requirements
 - vi) MFR program support requirements
 - vii) Real-time GPS ambulance location data feeds to the PSAPs to facilitate closest unit response to time sensitive cases
 - viii) Mutual aid requirements
 - ix) KCMCA financial support and requirements
 - x) Municipal and KCMCA indemnification requirements
 - xi) Performance assurance / accountability requirements
 - (1) Fines for failure to meet contract specifications (e.g. minor response interval non-compliance issues; Late or incomplete data or reporting submissions)
 - (2) Performance bonds to compensate communities for expenses and damages in the event of a major breach of the agreement that results in the ambulance contractor being removed.
 - (3) Regular public reporting of key performance metrics established by KCMCA in collaboration with the municipalities.
 - c) Establish clear policies for ambulance responses and clear delineation of ambulance territories.

7 RESPONSE INTERVALS

One of the most basic expectations that the public has for EMS is prompt arrival to an emergency. How well the EMS system meets that expectation can be objectively measured by a ‘system’ response interval – from the time that a caller contacts the ‘system’ until someone is able to provide aid.

This is a broader definition than what is usually applied. EMS ‘systems’ promote and support efforts to train the general public to recognize situations where 9-1-1 should be called as soon as possible and how to perform CPR. When a bystander applies that education to call 9-1-1 and begin CPR, that care is a part of the ‘system’ and the time that the 9-1-1 call was made and when the bystander CPR began should be recorded. Similarly, when the EMS ‘system’ has emergency medical dispatchers that guide callers in stopping bleeding, delivering a baby, or getting a piece of food from a choking victim’s throat, those times should be recorded. The times should be recorded even if the person providing aid is the patient! These recorded time can be used to measure ‘system’ performance.

At another level, the time interval from someone making a 9-1-1 call to the time that officially designated EMS personnel arrive at the address should also be recorded. This later definition is closer to how EMS unit response intervals are usually measured and how performance accountabilities are established with ambulance services and MFR agencies. This level of response interval measurement for EMS unit arrival is a key issue in EMS system design because it has profound implications on costs and, in some very specific cases, patient outcome. A longer emergency response interval target is less expensive but can harm patients with time sensitive problems. A shorter emergency response interval target is good for patients with time sensitive problems, but may cost more than the community is willing to pay for. Communities need to find the balance between what is needed clinically; what citizens reasonably expect from a customer service perspective; and what they are willing to pay for through taxes and user fees.

Clinical Considerations

There are a growing number of scientific studies and expert analyses that have carefully examined the actual impact that EMS response intervals have on clinical outcomes.^{21,22,23,24,25,26,27,28,29,30,31,32,33} This

-
- ²¹ Blanchard IE, Doig CJ, Hagel BE, et al: Emergency Medical Services Response Time and Mortality in an Urban Setting. *Prehosp Emerg Care*. Early Online Publication.
- ²² Blackwell TH, Kline JA, Willis JJ, Hicks GM: Lack of Association Between Prehospital Response Times and Patient Outcomes. *Prehosp Emerg Care* 2009;13:444–450
- ²³ Blackwell TH, Kaufman JS. Response time effectiveness: comparison of response time and survival in an urban emergency medical services system. *Acad Emerg Med*. 2002; 9:288–95
- ²⁴ Pons PT, Haukoos JS, Bludworth W, et al: Paramedic Response Time: Does It Affect Patient Survival? *Acad Emerg Med* 2005; 12:594–600
- ²⁵ Osterwalder JJ. Can the “golden hour of shock” safely be extended in blunt polytrauma patients? *Prehosp Disaster Med*. 2002;17:75-80
- ²⁶ Di Bartolomeo S, Valent F, Rosolen V, et al. Are pre-hospital time and emergency department disposition time useful process indicators for trauma care in Italy? *Injury*. 2007;38:305-311
- ²⁷ Pons PT, Markovchick VJ. Eight minutes or less: does the ambulance response time guideline impact trauma patient outcome? *J Emerg Med*. 2002;23:43-48
- ²⁸ Lerner EB, Billittier AJ, Dorn JM, et al. Is total out-of-hospital time a significant predictor of trauma patient mortality? *Acad Emerg Med*. 2003;10:949-954
- ²⁹ Petri RW, Dyer A, Lumpkin J. The effect of prehospital transport time on the mortality from traumatic injury. *Prehosp Disaster Med*. 1995;10:24-29

FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011

body of peer-reviewed literature has only found a very small number of illnesses or injuries where observed differences in response intervals, on the order of ± 10 minutes, made a difference in patient outcome. These extremely time sensitive cases are generally identified during the emergency medical dispatch process as 'Echo' category cases. The Echo cases include patients that have stopped breathing, no longer have a heartbeat, or are in a situation where such problems are an imminent threat. Echo cases are a very small portion of all calls that are received via 9-1-1, typically around 5%. The number of cases that actually turn out to be extremely time sensitive medical conditions upon assessment by the on-scene crews is usually less than 1%. The difference is a consequence of a reasonable level of erring on the side of safety with over-response rather than under-response if there is any doubt regarding the severity of the situation.

Cardiac arrest is the most extensively studied condition in the extremely time sensitive category. There is strong scientific evidence showing that initiation of care within 5 minutes after patient collapse is associated with higher rates of survival.

A consensus statement developed by the 2007 Consortium U.S. Metropolitan Municipalities' EMS Medical Directors states, "Ultimately, each community must evaluate response time interval goals not only in the broader context of satisfying public policy and public expectations, but also in terms of protecting both the driving and pedestrian public as well as what is best for the patient, their family, and the ultimate outcome of the sick and injured. Ideally, the response-time interval goals to which an EMS system should be held accountable should have as much clinical significance as political relevance. With the exception of basic CPR and AED response (in the case of cardiac arrest), there is insufficient evidence to strongly recommend a specific ALS (paramedic) response-interval target as part of an evidence-based model for performance evaluation of an EMS System."³⁴

For initiating basic CPR and applying an automated external defibrillator (AED), the 2007 Consortium U.S. Metropolitan Municipalities' EMS Medical Directors felt there was reasonable evidence to support the goal of providing these interventions in less than 5 minutes from the time that the 9-1-1 call was received until the first intervention is made (e.g., CPR is initiated or an AED shock is delivered). In other words, the differences observed in EMS response intervals (again, on the order of ± 10 minutes) matter for cardiac arrest but little else.

Their recommendation has an operational focus with the response interval clock starting at the time that 9-1-1 was contacted and stopping when the first intervention is made. Clinically, the literature looks at the time the heart stops beating (collapse; cardiac arrest onset) to the time of the first intervention. Unfortunately, most EMS systems, including KCEMSS, only track the time from MFR or ambulance service notification to arrival at the call address (on-scene).

³⁰ Pepe PE, Wyatt CH, Bickell WH, et al. The relationship between total prehospital time and outcome in hypotensive victims of penetrating injuries. *Ann Emerg Med.* 1987;16:293-297

³¹ Stiell IG, Nesbitt LP, Pickett W, et al. The OPALS major trauma outcome study: impact of advanced life-support on survival and morbidity. *CMAJ.* 2008;178:1141-1152

³² Lerner EB, Moscati RM. The golden hour: scientific fact or medical "urban legend"? *Acad Emerg Med.* 2001; 8:758-760

³³ Newgard CD and the Resuscitation Outcomes Consortium Investigators: Emergency Medical Services Intervals and Survival in Trauma: Assessment of the "Golden Hour" in a North American Prospective Cohort. *Ann Emerg Med.* 2010; 55:235-246

³⁴ Myers B, Slovis C, Eckstein M, et al: Evidence-Based Performance Measures for Emergency Medical Services Systems: A Model for Expanded EMS Benchmarking. A Statement Developed by the 2007 Consortium U.S. Metropolitan Municipalities' EMS Medical Directors. *Prehosp Emerg Care.* 2008;12:141-151

FINDINGS AND RECOMMENDATIONS ON EMS IN KENT COUNTY – NOVEMBER, 2011

Consider a scenario in which the following events occur in ‘reasonable to expect’ time frames for an urban response to a witnessed onset cardiac arrest under normal operating circumstances:

- Time interval from witnessed collapse to making the call to 9-1-1, approximately 1 minute
- Call received at the 9-1-1 PSAP until the emergency medical dispatcher at the ambulance communications center is brought onto the line, approximately 30 seconds
- Emergency medical dispatcher begins medical questions until the appropriate ambulance and MFR units are selected and notified, approximately 30 seconds
- Ambulance and MFR units notified to first unit on-scene, averages at approximately 5 minutes 30 seconds in KCEMSS
- First unit on-scene to patient contact, if a single story residential structure with no obstructions and an open door, approximately 1 minute
- Patient contact to CPR started or first AED shock given, approximately 1 minute

This scenario has an elapsed time interval from PSAP call received to first intervention of 8:30, which is well past the recommended <5 minute target from the 2007 Consortium of U.S. Metropolitan Municipalities’ EMS Medical Directors. To get this time interval down to 5 minutes, the first crew would need to arrive on-scene within 2 minutes of being notified if the other intervals remained constant. This is all but impossible to achieve at a reasonable cost. If we add in the pre-9-1-1 time intervals from collapse to 9-1-1 called, the time from collapse to first intervention is 9:30.

Fortunately, there are some solutions to this problem and KCEMSS has implemented some of them. Pre-arrival instructions for CPR and automated external defibrillator (AED) use being given by emergency dispatchers. The system, to include agencies such as the American Red Cross and American Heart Association, trains members of the general public to do bystander CPR and use AEDs. The system encourages businesses to make AEDs available in key locations. These efforts are a part of the ‘system.’ Unfortunately, when any of these efforts result, as intended, in care being initiated before the first EMS crew arrives, the times are not tracked for analysis of a ‘system’ response interval. Without good measurement of how the ‘system’ operates in detail, process improvement efforts are severely impeded. Other potential solutions to improve system response intervals to cardiac arrest are presented in the ‘Recommendations (System)’ section.

There is another category of EMS cases that are time sensitive, but to a much lesser degree than those associated with loss of breathing and/or pulses. These cases most notably include S-T segment elevation myocardial infarctions (STEMI) and strokes. In these cases, outcome does not appear to be affected by response interval differences of ± 10 minutes earlier or later. Guidelines from the American Heart Association suggest that the time from someone making the 9-1-1 call to initiation of treatment in an appropriate hospital specialty care unit be within 90 minutes for STEMI³⁵ and within the first few hours for stroke.³⁶ This provides for a bit of latitude in the EMS response.

The more important issue in STEMI and stroke is reducing the delay from symptom onset to calling 9-1-1. Unfortunately, it is quite common for patients to wait for *hours* after their cardiac symptoms appear before they call 9-1-1. Like cardiac arrest, what matters clinically is not the time from the 9-1-1 call, but the time from symptom onset to hospital specialty unit intervention.

³⁵ American College of Cardiology/American Heart Association Task Force on Practice Guidelines: 2007 Focused Update of the ACC/AHA 2004 Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction. *Circulation*. 2008;117:296-329

³⁶ American Heart Association/ American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Groups: Guidelines for the Early Management of Adults With Ischemic Stroke. *Stroke*. 2007; 38:1655-1711

FINDINGS AND RECOMMENDATIONS ON EMS IN KENT COUNTY – NOVEMBER, 2011

One other category of patients warrants discussion from a time sensitivity perspective – those in significant pain. In some, but not all cases, prolonged pain can change their clinical outcome. Regardless of its impact on clinical outcome, there is a strong ethical problem when patients are unnecessarily subjected to prolonged pain and suffering.

For most other types of calls, there may be greater latitude in response interval performance from a purely clinical perspective.

Financial Considerations

Financially, the faster the emergency response interval target, the more expensive it will be to reach. The relationship between decreasing the response interval target and increasing cost is not linear. For example, going from a target response interval of 9 minutes to 8 minutes is more expensive than going from a 10 to 9 minutes. A difference of a minute or two in the target response interval at the same level of reliability can increase or decrease total costs in a community like Kent County by several million dollars per year. Therefore, any change in the target response interval should be considered very carefully in terms of the real impact it will have on patients as well as the cost of operating the system. Generally speaking, the community can have whatever ambulance target response interval it is willing to pay for through tax subsidies or whatever the ambulance services are willing to provide without subsidies.

Community Preference

Everyone, especially patients, would prefer to be able to count on EMS arriving with a minute or two after a call for help is made. This is financially impractical for the reasons stated in the financial considerations section. For cases other than those in dispatch category Echo, there is little evidence to suggest the clinical outcomes are compromised if the response interval is a few minutes longer.

The lack of scientific evidence showing an impact of several minutes sooner or later in EMS response intervals on patient outcome (for cases other than cardiac arrest or peri-arrest conditions) is in stark contrast to the impressions of the general public – and many in the emergency medicine and public safety communities. This represents a significant challenge if a change in the status quo is made in an effort to decrease operating costs by lengthening response interval standards (for cases other than those that are extremely time sensitive, to include cardiac arrest or peri-arrest conditions).

Scientific Evidence Regarding Response Intervals and Survival Rates

For those extremely time sensitive cases (i.e., cardiac arrest or peri-arrest conditions), neither ambulances or MFR units arrive soon enough. About 2/3rds of the patients in Kent County that had the best chances for survival³⁷ did not make it.

A very commonly referenced scientific paper from Seattle states, “If CPR was initiated within 4 minutes and if definitive care was provided within 8 minutes, 43% of patients survived. If either time was exceeded, the chances of survival fell dramatically.”³⁸ To understand this paper in 2011, it is important to understand the context.

First, the time frames stated in the paper are from the time of collapse, not the time that a call was received at the 9-1-1 communications center. Second, definitive care in the 1979 paper refers

³⁷ The patients generally considered to have the best chance for survival are those who arrest from a cardiac-related cause, have a witnessed onset of arrest, and have a ‘shockable’ heart rhythm. In Kent County, only 37.3% of such patients survived to hospital discharge.

³⁸ Eisenberg MS, Berger L, Halstrom A: Cardiac Resuscitation in the Community: Importance of Rapid Provision and Implications for Program Planning. 1979. JAMA 241:1905-1907

FINDINGS AND RECOMMENDATIONS ON EMS IN KENT COUNTY – NOVEMBER, 2011

primarily to defibrillation. In 1979, defibrillation was only available in the field on an ALS unit. This is no longer the case – even laypersons can use an AED if one is available nearby the patient.

The 1979 paper implies that there is a precipitous drop off in survival if the 4 minute BLS and 8 minute ALS time thresholds are exceeded. These times represent cut-off points where the data was divided to make statistical comparisons. In a 1997 study, the Seattle investigators pooled their data from Tucson to include more cases in the analysis and perform a regression analysis to more precisely characterize the relationship between time intervals and survival rates. Visualization of the time interval – survival rate curves does not show any deflection points as was often misinterpreted from their 1979 paper. *The message from all of this is simple – sooner is better.* Response interval goals for cardiac arrest interventions must not be misconstrued to mean that there is little difference in survival rates between the collapse to CPR intervals of 1, 2, or 3 minutes – just as long as it is sooner than 4 minutes. The same applies to the definitive care (ALS) threshold of 8 minutes. Also keep in mind that the ‘clock’ begins ticking at the time of collapse, not the time when the 9-1-1 call is answered and certainly not when the crew goes en route the scene. The clock stops when key interventions, such as CPR or defibrillation are performed, not when an EMS crew arrives at the address.

Limitations in Response Interval Data

There are important limitations in both the MFR and ambulance service response interval data analysis in this study that need to be understood to put the findings that follow in context.

Some of the raw data requested for the study was obtained from the computer aided dispatch systems of the ambulance services. For MFR departments dispatched by the City of Grand Rapids 9-1-1 communications center, response interval data was also obtained from a computer aided dispatch system. For MFR departments dispatched by the Kent County Sheriff's Office (KCSO), data had to be obtained from records management systems in each individual fire department. This is because of the severely limited reporting capabilities of KCSO's current dispatch computer system. The MFR records management systems generally rely on manual field data capture (or manual transcription of times obtained by telephone from dispatchers) and manual entry into the records management systems.

Response interval data was not available from the following MFR departments: Cannon, Casnovia, GRF Airport, and Oakfield. This missing data represents approximately 5% of the total MFR call volume in Kent County.

While there is generally better accuracy and precision from the computer generated data, both the manual and computer-aided systems are subject to errors. The response interval information was not subjected to case by case review by the providers for erroneous data. Therefore, a ‘rough’ filtering was applied to exclude responses with missing or incomplete required information. Significantly extended responses, herein defined as greater than 30 minutes, were also excluded. After this report has been presented to the stakeholders and general public, it will be necessary to review each of the calls with response intervals over 30 minutes on a case by case basis (a very tedious and time consuming process) to determine if there are data validity issues to justify their exclusion or if a correction can be applied. After such review and correction, the data may be considered ‘validated’ and used further analyses and calculations for a clear ‘baseline’ on response interval performance.

Given the very small number of cases at issue and the very large number of total cases being analyzed, the impact of excluding the potentially erroneous cases with response intervals >30 minutes on the average and 90th percentile calculations is minimal. Therefore, the average and 90th percentile calculations will be presented in this report and would not be expected to significantly change after the validation process is complete.

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

Before the response interval information is considered valid for purposes of establishing a baseline performance level for calculation of other types of metrics and graphical analyses, the validation processes described above need to be completed. These other tools will be much more sensitive to the presence of erroneous data than simple averages and 90th percentiles. Therefore, the types of reports that *should be* routinely generated for system and provider monitoring purposes will be shown using data from other sources and are for illustration purposes only. Once the appropriate review and correction of the response interval data is completed, the analyses may be applied with the validated data to generate additional system performance baselines.

Response Interval Data Reporting

It is important to have data on response interval performance that is accurate, precise and concise. Visual reports, if properly designed, utilized and interpreted, can be a tremendous aid.

The following charts illustrate some of the types of visual reports that are recommended for routine use after the data validity issues for baseline data are addressed. These types of reports should be generated at regular intervals (e.g., monthly) on an on-going basis. **NOTE: The data in these graphs are for illustration of the recommended visual reporting formats. The data in the graphs are NOT from Kent County.**

Response Interval Distribution Graph (Figure 2) - This purpose of this visual report is to show how often it took to respond within one minute, two minutes, three minutes, etc. A response interval standard might call for 90% of calls to response interval of 12 minutes. This graph helps to understand what is happening in the other 10% of calls – which, unfortunately, tends to get ignored so long as the 90% target is achieved. In this sample report, assume that the data is for emergency responses in a system with a standard of 12 minutes with at least 90% compliance. The fine green line shows the 90% compliance line, which is falling between 12 and 13 minutes. Commonly used EMS report formats would simply state that the 90% compliance level was reached at 12:46 – a bit short of the standard. However, this report reveals that there are many responses that went well beyond 15 minutes and some even past 30 minutes. Assuming that the data used in the graph was validated, it suggests there may be a significant problem in the response process which would likely have been missed without this type of analysis.

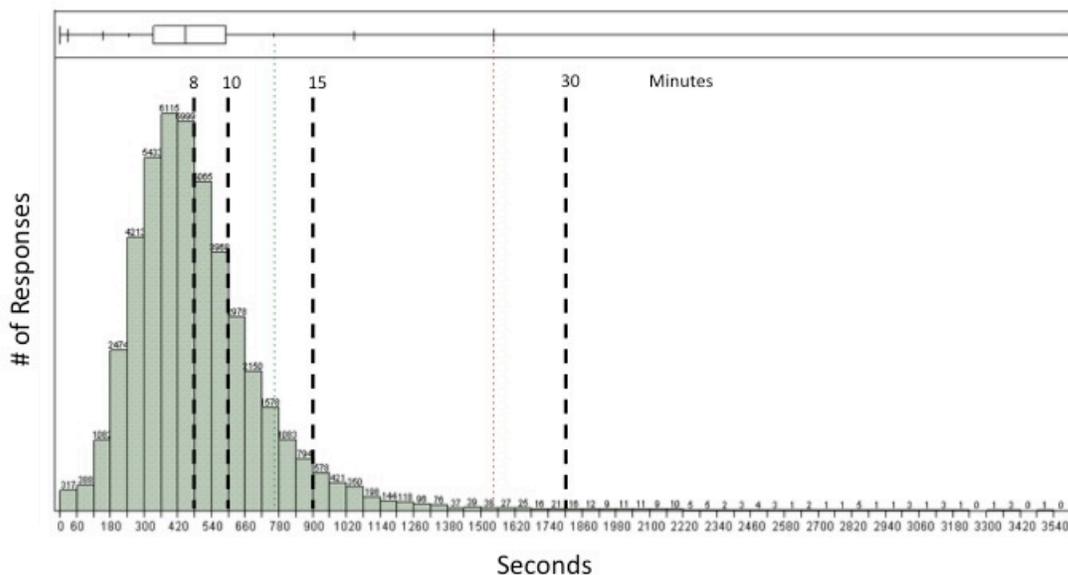


Figure 2 - (Sample) Response Interval Distribution Graphs – This graphical report consists of a histogram linked to a box plot. Each bar of the histogram shows how many responses occurred in each one minute interval. The bold black dashed lines show where the

FINDINGS AND RECOMMENDATIONS ON EMS IN KENT COUNTY – NOVEMBER, 2011

8, 10, 15 and 30 minute marks fall. The very fine green dashed line marks the 90th percentile. The very fine red dashed line marks the 99th percentile. The box plot running across the top shows quartiles and a variety of percentiles. *NOTE: The data in these graphs are for illustration of the recommended graphical reporting format. The data in the graphs are NOT from Kent County.*

Geographic Response Interval Distribution Map (Figure 3) - This visual report is designed to show how response interval performance has trended across a geographic area for a specific time period, such as a month or year. The colors can represent either the average or the 90th percentile in response interval performance. ‘Warmer’ colors correspond to faster response performance, ‘cooler’ colors for slower performance. Hence the ‘heat map’ nickname for this type of visual data reporting tool. Commonly used EMS reports would simply report a % of compliance to a response interval standard in a specific city, council district, zip code, etc. This report allows someone to see what the trend in response interval performance was in specific areas.

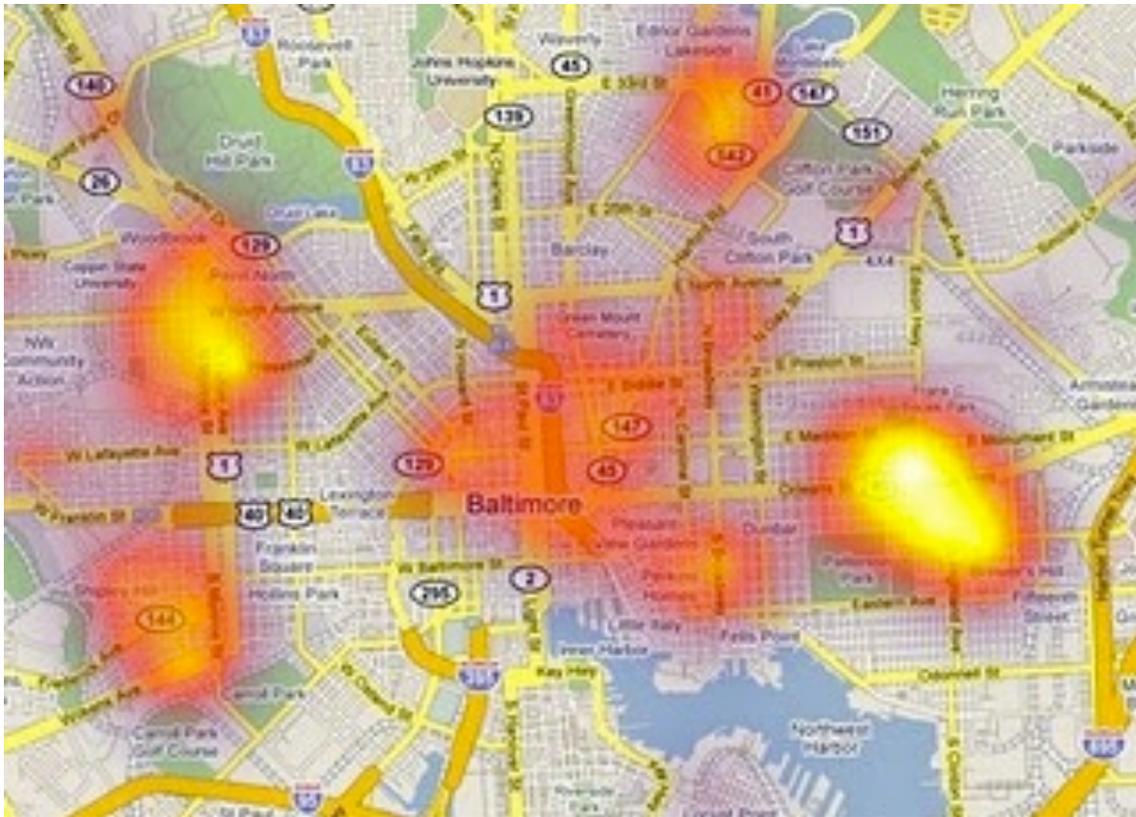


Figure 3 – (Sample) Geographic Response Interval Distribution Map – This visual report overlays colors representing different levels of response interval performance on a map. *NOTE: The data in these graphs are for illustration of the recommended graphical reporting format. The data in the graphs are NOT from Kent County.*

Statistical Process Control Chart for Response Intervals (Figure 4) – This purpose of a statistical process control chart is to objectively discern between expected and unusual performance in the response process using sound and consistent methods. This allows for much more effective identification of problems and corrective actions. Commonly used EMS reports simply report which calls exceeded a response interval standard. Quite often, any response that exceeded the standard is considered ‘unusual’ and corrective actions are taken based on what happened on that call. If calls

FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011

that exceeded the standard did not actually represent a statistically significant difference in performance, such corrective actions may hurt rather than help process performance.

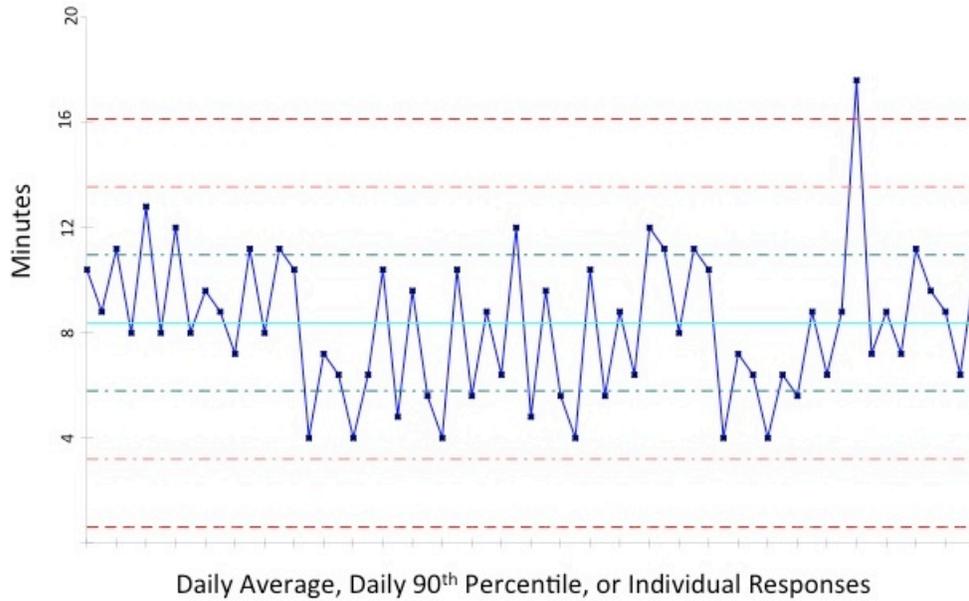


Figure 4 – (Sample) Statistical Process Control Chart for Response Interval Performance – This graph provides a reliable way to discriminate between expected and unusual behavior in the response process. This allows for much better management decision making on when and when not to take corrective actions. *NOTE: The data in these graphs are for illustration of the recommended graphical reporting format. The data in the graphs are NOT from Kent County.*

FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011

Findings (Ambulance Services)

1. The KCMCA has set emergency response interval standards that all of the ambulance providers are expected to comply with. These standards differentiate between areas designated urban, suburban and rural, as shown in Figure 5. These lines have not been updated for many years. A process to update the lines in context of 2010 census data was recently started.

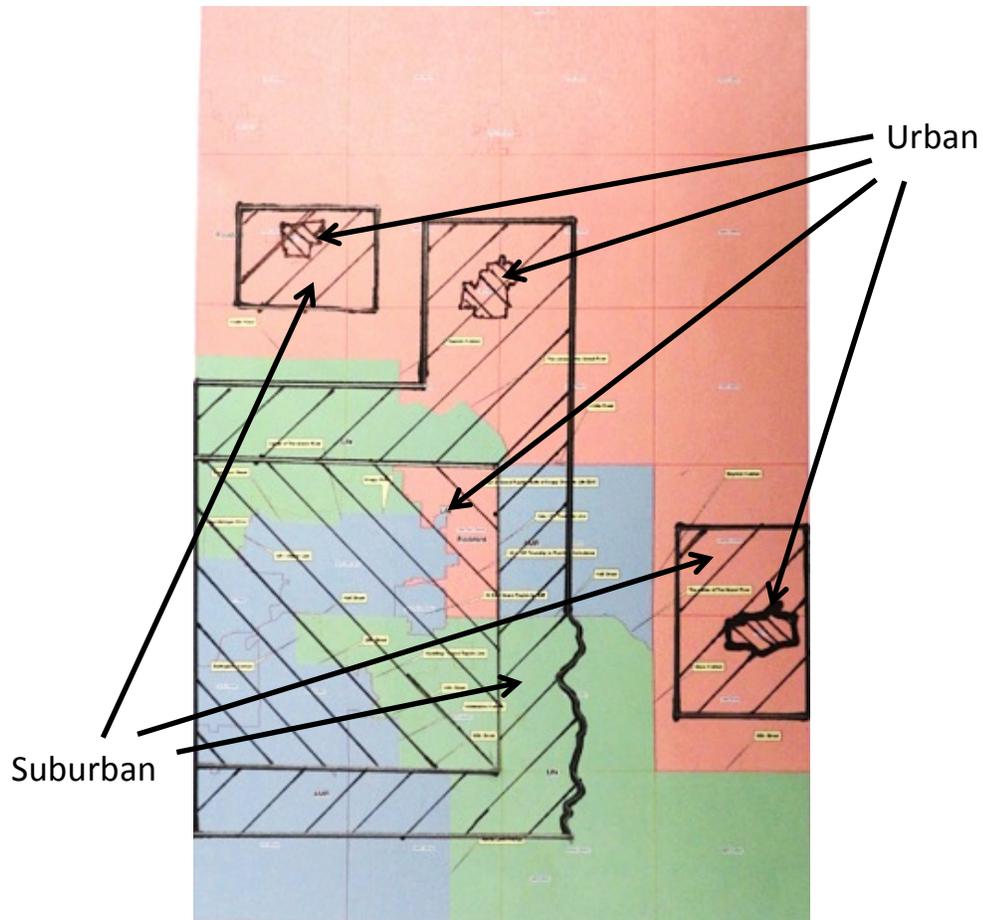


Figure 5 - Urban, Suburban and Rural Response Zones

2. The current target response intervals for ambulances, as established by KCMCA, are as follows:
 - a. Emergency Responses (“Med 1 and 2”)
 - i. Urban – 8:00 with 90% or greater reliability
 - ii. Suburban – 12:00 with 90% or greater reliability
 - iii. Rural – 15:00 with 90% or greater reliability
 - b. Non-Emergency Responses (“Med 3”)
 - i. All regions – 20:00 with 90% or greater reliability
3. The geographic distribution of emergency ambulance responses with scene arrival is shown in Figure 6.

FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011

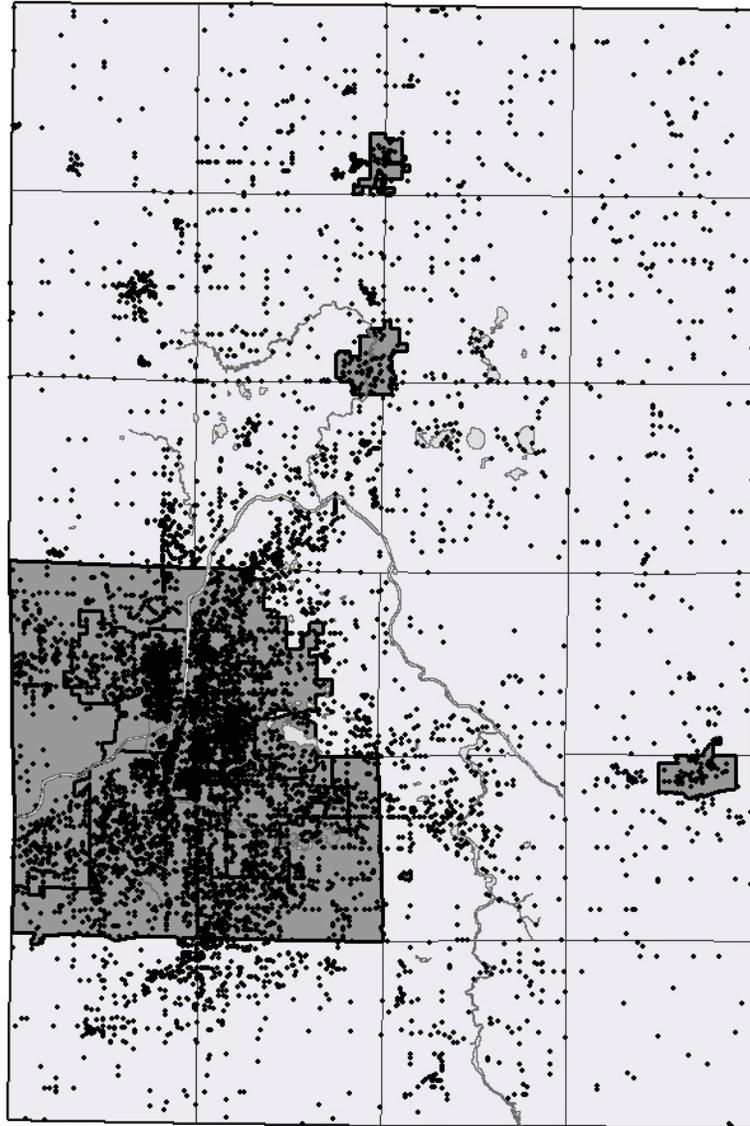


Figure 6 – Locations for emergency responses by ambulances (with scene arrival) in 2010

- 9) Looking at the aggregate performance of the ambulance services in 2010, on 29,412 emergency (Med 1) calls³⁹ that met inclusion criteria, the response interval averaged 9:08. The 90% reliability level was reached at 15:22.
 - a) These data are not separated on the basis of urban, suburban and rural locations, which have different target response interval standards. The overwhelming majority of responses are in urban and suburban areas and the less stringent standard of the two is for suburban areas at less than 12 minutes with at least 90% reliability. Since the 90% threshold is not met until 17 minutes and the data set includes a large portion of urban responses and a much smaller

³⁹ In an abundance of caution on data validation, all data for emergency ambulance responses exceeding 30 minutes was excluded.

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- portion of rural responses, it strongly suggests there are opportunities for performance improvements.
- 10) In the past, the ambulance services provided KCMCA with monthly reports on the response interval performance. The ambulance companies have offered to provide information if asked, but KCMCA staff felt that there wasn't much point in reinstating the monthly response interval reporting since KCMCA had no enforcement powers if any providers were found performing below standards.

Recommendations (Ambulance Services)

- 1) Community preferences on target response intervals for ambulances should be evaluated using valid market research methods.
 - a) These preferences should be sought after the participants have been briefed on the research regarding the impact of response intervals on clinical outcomes.
 - b) Participants should be informed of the subsidy level they now pay on their taxes for ambulance service (i.e., zero) and the response interval performance now provided in urban, suburban and rural areas.
 - c) Participants would be asked how much they would be willing to pay in a new tax subsidy for a decrease of a specified number of minutes (e.g. 2 minutes) in ambulance response intervals in urban, suburban and rural areas (same for MFR). This is intended to provide context for financial discussions.
- 2) If the current system of County-wide emergency and non-emergency ambulance service without subsidy is to be preserved, it is important to be careful not to set response interval standards in such a way that makes it financially impractical for ambulance services to continue to operate subsidy-free.
- 3) Given the one large central population center in Kent County, the easiest and most economical way to meet a response interval target with 90% or better reliability is to concentrate the placement of ambulances around the high population density center area of the County. However, this can leave the lower density areas highly vulnerable to much longer response intervals. To mitigate this risk, response interval standards need to be established and enforced for all areas of the County. These should differ between urban, suburban and rural areas of the County in order to be economically practical.
 - a) To reduce the potential for significantly delayed response intervals in the remaining 10% of cases, a threshold should be set for a 'not to exceed' response interval, perhaps at twice the normal target response interval where 90% reliability is expected. Exceeding this threshold would be associated with more severe penalties.
 - b) The ambulance companies would have a mechanism to request an exception to the target response interval standards on a specific call based on special circumstances if it meets criteria established by the KCMCA. A call that is identified as having special cause variation on statistical process control chart should be considered in those criteria.

Findings (MFR)

- 1) The KCMCA has adopted the emergency response interval standards established the National Fire Protection Association (NFPA Standards 1710 and 1720). These standards differentiate between career and volunteer departments. They DO NOT differentiate between urban, suburban and rural areas.
- 2) The geographic distribution of emergency MFR responses (Med 1 and 2) is shown in Figure 7.

FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011

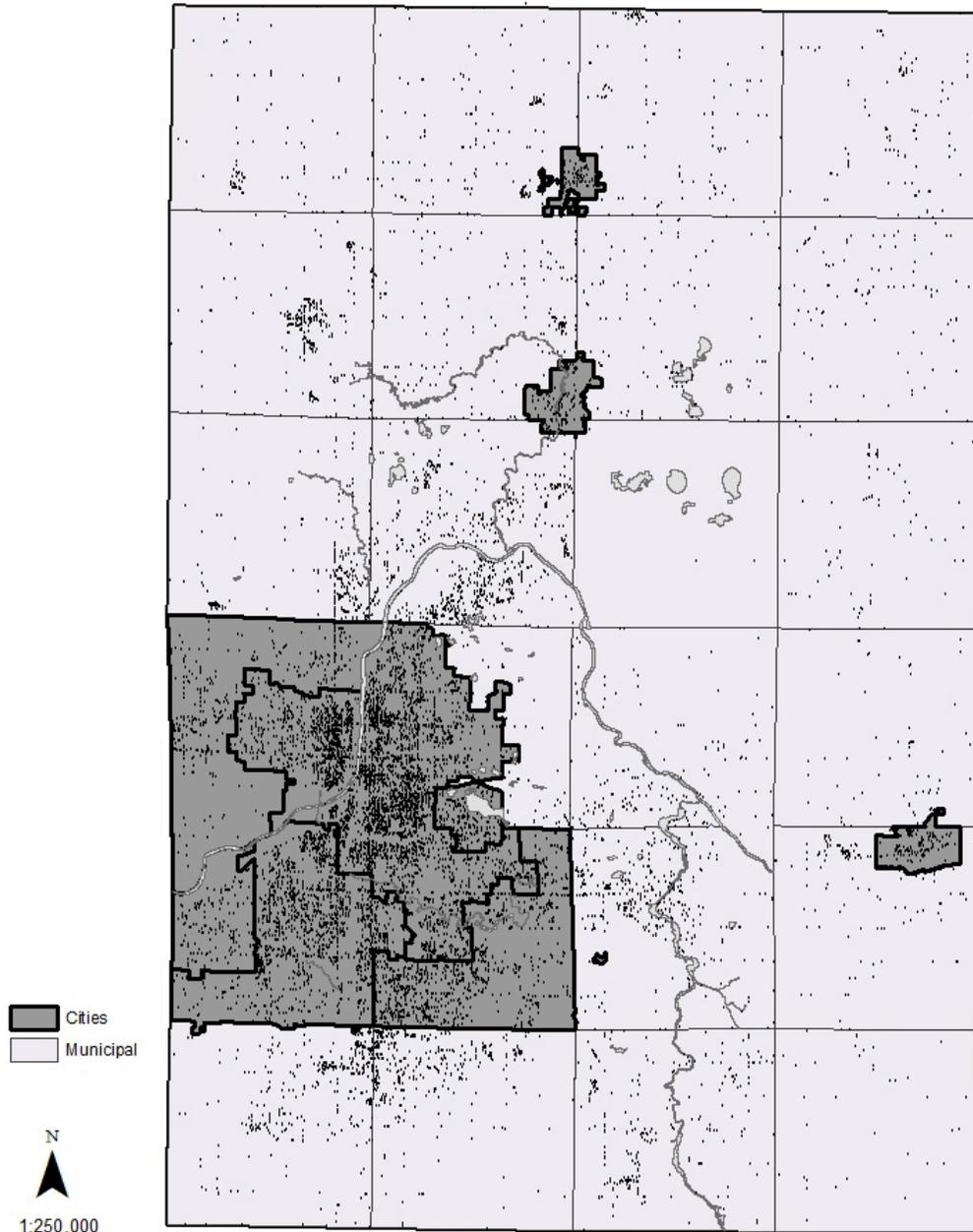


Figure 7– MFR emergency (Med 1 and 2) response locations in 2010

- 3) Analysis was made of 13,670 emergency (Med 1 and 2) responses with useable data. The combined MFR response interval performance averaged 9:15. The 90% reliability level was reached at 15:11. Presently, these data do not separate urban, suburban and rural locations nor do they differentiate between career and volunteer department responses.
 - a) Volunteer department responses may be much longer than career departments because the volunteers may have to first come to the station from work, home or other location in the community to get their vehicle and equipment before going to the scene.

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

Recommendations (MFR)

- 1) Community preferences on MFR target response intervals should be assessed using valid market research methods.
 - a) These preferences should be sought after the participants have been adequately informed of the research examining the impact of response intervals on clinical outcomes.
 - b) Participants should be informed of the subsidy level they now pay on their taxes for MFR service and the response interval performance now provided.
 - c) Ask participants how much extra they would be willing to pay in taxes for a decrease of 2 minutes in MFR response intervals in their community. This is intended to provide context for financial discussions.

Recommendations (System)

- 1) A process for linking time data from the many disparate sources on an EMS call is needed. This will allow *system* performance to be measured for intervals such the time of collapse to the start of CPR or delivery of the first defibrillator shock on a cardiac arrest case, even when those interventions are made by a bystander rather than an EMS crew. Part of the solution may be implementation of a universal patient identifier system. Such a system has been used successfully with EMS providers and hospitals in Orange County, FL for several years.
- 2) Develop and refine processes over time to better determine the time of:
 - a) Clinical problem onset (e.g. time of onset for cardiac arrest as well as other less time sensitive cases such as chest pain, stroke symptoms, major trauma).
 - b) Bystander interventions (e.g. started CPR)
 - c) Dispatch pre-arrival instruction interventions (e.g., dispatcher-prompted CPR initiation times)
 - d) Data retrieval, to include times, from public access defibrillators that are activated to care for a patient
 - e) Patient contact by each EMS crew (MFR and ambulance, including any supervisory staff) to enable accurate measurement of initial patient contact time by EMS.
- 3) The KCEMSS, through KCMCA, should take responsibility for the performance metrics associated with the frequency of bystander CPR and public access defibrillator utilization.
- 4) Take a more aggressive and creative approach to promoting bystander CPR, and include very strong efforts to encourage, facilitate and sponsor CPR training programs, with an emphasis on the new compressions-only CPR technique.
- 5) Engage community partners with fleet operations to participate in a program that would allow their vehicle locations to be displayed in real-time on a layer of the electronic maps in the 9-1-1 CAD system in the event of a witnessed onset cardiac arrest. Using ‘vetted’ personnel is an important consideration to protect the public when they are most vulnerable. If a participating fleet vehicle is available and in proximity, it would be asked to respond to the scene to begin CPR and/or utilize a defibrillator (if available). Potential community partners with fleet operations that may be suited for such roles might include:
 - a) Wheelchair medical transportation units
 - b) Package delivery services (e.g., FedEx, UPS)
 - c) Hospital courier services
 - d) Non-MFR police units
 - e) Other municipal vehicles
 - f) Utility service vehicles
- 6) Create a program that allows appropriately vetted and trained individuals to opt-in to respond to cardiac arrest cases to which they are in close proximity.

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- a) Their locations would be determined using their GPS enabled cellular smart phones equipped with an app that locates and notifies them as needed. Individuals appropriate for participation might include:
 - i) Off-duty EMS and other medical personnel
 - ii) CERT team members
 - iii) Others who agree to appropriate background checks
 - b) The app may be used in conjunction with other software⁴⁰ in the dispatch center which shows the location and availability status of nearby public access defibrillators so they may be brought to a scene.
- 7) As soon as possible begin using the National AED Registry⁴¹ to capture the location and other key data elements for all AEDs in the community so this information can be made available to emergency medical dispatchers and the smartphone app when it is deployed.
- a) A public awareness and participation campaign should be developed in conjunction with local media outlets to help gather this information.

⁴⁰ Atrus - <http://www.atrusinc.com> (last accessed 06Oct11)

⁴¹ National AED Registry - <http://www.aedlink.com> (last accessed 06Oct11)

8 HEALTHCARE SYSTEM INTEGRATION

Findings

- 1) EMS in Kent County has a reasonable level of integration with local hospital emergency departments. Hospitals, ambulances, and MFRs participate in many projects and initiatives where there are EMS to hospital process dependencies. Examples include joint initiatives for optimizing care of patients with major trauma, stroke, and heart attacks. Despite these joint initiatives, there is poor integration of performance improvement and prevention efforts.
- 2) The integration of EMS with the rest of the healthcare system is quite limited.
- 3) There is good alignment between the EMS system design and the community's use of EMS for true medical emergencies. However, true medical emergencies are only a small portion of 9-1-1 medical calls.
- 4) There is a good alignment between the EMS system design and calls received via seven digit phone lines at each ambulance service for non-emergency inter-facility ambulance transportation.
- 5) There is very poor integration of information systems between EMS and hospitals, which is covered in more detail in the Information Systems section of this report.
- 6) A significant portion of 9-1-1 calls that come to EMS are for lower acuity medical problems. Utilizing EMS and emergency departments for these types of problems constitutes a type of healthcare 'safety net' that people turn to when other options for access to healthcare are not available, difficult to use, or are simply not utilized for any number of reasons. For the uninsured or under-insured, EMS and EDs often become a primary source of their healthcare by default. This situation is not unique to Kent County. It is present throughout the United States.
 - a) Because the EMS system was not designed to meet this need, EMS crews are not trained to evaluate and triage these lower acuity, and often chronic, medical conditions. These patients have to be triaged in the ED. Although it sounds odd, ambulances often end up taking patients to the emergency department to see if they need to be seen in the emergency department. This is an extremely inefficient use of resources.
 - b) Because ambulance services are only paid when they transport a patient, there is a powerful disincentive for implementing potential improvements that aim to safely treat and release or refer these patients from the field.

Recommendations

- 1) There are opportunities to improve integration between EMS, hospitals and other healthcare system components through better coordination of prevention and performance improvement efforts.
- 2) Develop better processes of care in the field for:
 - a) Urgencies (minor illnesses and injuries such as ear aches; minor cuts; minor abrasions)
 - b) Chronic care support cases (e.g., lower acuity problems from diabetes and chronic respiratory problems; frequent falls due to inadequate home care resources)
- 3) Bring together local stakeholders from EMS, public health, hospitals, and payers to begin to discuss:
 - a) Nature and scope of 9-1-1 and emergency department resource utilization for urgencies and chronic care support cases using the 9-1-1 system;

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- i) Clinical consequences of inadequate care for those cases;
 - ii) Costs to payers (governmental and private) for those cases; and
 - iii) Ways to eliminate, reduce or mitigate the problem.
- b) In parallel, begin to explore existing research, program development efforts, and best practices in other EMS systems for these cases. Examples to consider include:
- i) Frequent 9-1-1 caller intervention programs
 - (1) Houston Fire Department’s CareHouston program⁴²
 - (2) Alameda County EMS’ (CA) Project Respect⁴³
 - ii) Community Paramedicine programs, such as those described at the International Roundtables on Community Paramedicine⁴⁴
 - iii) Wake County (NC) Advanced Practice Paramedic program⁴⁵
 - iv) Asthma Assessment and Education Program from AMR in Alameda County (CA)⁴⁶
- c) Consider options for development of pilot programs in collaboration with payers who stand to gain from program success.

⁴² <http://www.jems.com/article/operations-protocols/carehouston-provides-new-appro-0/>

⁴³ <http://documents.csh.org/documents/ResourceCenter/HotTopicsSH/2010-FrequentUsers/ProjectRESPECTSummary.doc>

⁴⁴ <http://www.ircp.info>

⁴⁵ <http://www.wakegov.com/ems/staff/app.htm>

⁴⁶ <http://itunes.apple.com/us/podcast/asthma-assessment-education/id350488765?i=80479244>

9 INFORMATION SYSTEMS

Findings

- 1) Both of the PSAPs are using computer aided dispatch systems; They are in the process of being upgraded to a contemporary platform with robust reporting, electronic call transfer, and full redundancy capability between the two PSAPs.
- 2) All MFRs are using computerized records management systems to record key information from each response.
- 3) All three ambulance services are using a tablet-based electronic medical record system to document patient care in the field.
- 4) All ambulance and MFRs are submitting a data set from each 9-1-1 ambulance call to a State EMS data network. The State EMS data system potentially provides a source of data from MFRs and ambulances on the same response, but the data is not linked and the query/reporting tools are cumbersome.
- 5) EMS data from the tablet computers are being faxed to the receiving hospital emergency departments. The hospitals, including the emergency departments, have electronic medical records. This makes it necessary to scan the EMS report back into some type of digital format to get it into the hospital record.
- 6) Processes are not in place to integrate data from disparate sources (i.e., primary PSAP dispatch, ambulance dispatch, MFR data, ambulance data, MedCom data, online medical control physician data, emergency department data and hospital data) into a single record or data view that would allow analysis of complete episodes of care – individually or in aggregate.
- 7) Processes are not in place to facilitate feedback to EMS crews on the hospital diagnosis or outcomes of the patients they treated – for individual cases or in aggregate.
 - a) Without feedback on specific cases, EMS crews are unable to adequately reflect on their assessment and treatment in an effort to improve, with the following exceptions:
 - i) The EMS medical director has the ability to get feedback on the outcome of individual cases, but it is time consuming and impractical for anything beyond special requests from crews.
 - ii) Hospitals will sometimes provide feedback on specific types of individual cases, such as stroke or heart attack patients. There is not feedback in aggregate.
 - b) Without feedback in aggregate, EMS system protocols and processes cannot be adequately evaluated in an effort to make improvements, with the following exception
 - i) Hospitals and ambulance services are currently collaborating to participate in gathering process and outcome data on cardiac arrest cases. Similar efforts are underway to improve care for heart attacks.
 - ii) PSAP, EMD, MFR and bystander data is currently missing from the cardiac arrest data collection process
- 8) Based on a convenience sample of provider units and hospital emergency departments, a reasonable level of time synchronization was found between clocks that are used to log event times across the continuum of emergency care (i.e., by the PSAPs, ambulance communications centers, MFR records, MFR defibrillators, ambulance patient care report tablets, ambulance defibrillator/monitors, MedCom communications center, hospital electronic medical record systems, and hospital defibrillator/monitors).

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- a) The PSAPs, ambulance communications centers and hospitals link their data systems to network clocks that have utilities to automatically synchronize to a standardized time system (e.g., UTC - coordinated universal time⁴⁷)
- b) There were two notable exceptions: wrist watches that may be used by medical personnel to manually write down event times; and ambulance and MFR defibrillators that were recently serviced.

Recommendations

- 1) Consider implementation of a universal patient identifier system to enable integration of data from disparate sources (i.e., primary PSAP dispatch, ambulance dispatch, MFR data, ambulance data, MedCom data, online medical control physician data, emergency department data and hospital data) into a single record or data view that would allow analysis of complete episodes of care – individually or in aggregate.
 - a) The EMS system in Orange County, FL has had this type of system in place for several years. It uses a bar coded wristband that is applied by the field provider (MFR or ambulance) that makes the initial patient contact. Wake County, NC also has a similar system.
- 2) Consider implementation of a software system to automate the feedback process to EMS from the hospitals. A potential solution may be available from Axial Exchange with their EMS Alerts product (<http://www.axialexchange.com/products/axial-ems-alerts.html>).
- 3) Consider building or purchasing utilities that would allow the EMS tablet computers to electronically transfer data into the hospital electronic medical record. The preferred method would be field by field data transfer so that the information can be searched, manipulated and reported on. If not possible or too expensive, a compromise may be an electronic import of an image file of the EMS data that gets attached to the hospital's electronic medical record.
 - a) Life EMS and Spectrum Health have been successful in building an 'in-house' tool for the EMS to hospital data exchange. It is unknown how well this will work with other ambulance services and other hospitals.
 - b) The EMS Alerts product may offer a commercial solution that is compatible with each of the ambulance services and hospitals (<http://www.axialexchange.com/products/axial-ems-alerts.html>).

⁴⁷ <http://www.timeanddate.com/time/aboututc.html> (last accessed 20Oct11)

10 EVALUATION AND QUALITY MANAGEMENT

Findings

- 1) A process or policy for a periodic comprehensive review of the overall EMS system by a third party with appropriate expertise is lacking.
- 2) Formal quality management programs are in place with each of the ambulance services.
- 3) Formal quality management programs are lacking in the MFRs.
- 4) Hospitals seem to be well versed in contemporary quality management methods and have training and resources in place to support formal improvement projects.
- 5) Ambulance service quality management programs vary widely in approach. This severely limits the ability to aggregate results to look at issues from a system perspective.
- 6) Formal training in quality management is very limited for ambulance service and MFR managers.
- 7) There isn't a common quality management framework that the ambulance services and MFRs are working from. It does not seem that the hospitals have a common framework either, beyond their commonalities in trying to conform to the same or similar regulations and accreditation standards.
- 8) Processes are lacking to measure performance of the entire system across jurisdictional and institutional boundaries.
 - a) No processes are in place to effectively examine an entire episode of care from the initial 9-1-1 public safety answering point (PSAP) call taking and transfer action; to emergency medical dispatch (EMD); through MFR services; through ambulance services; through emergency department (ED) services; and through any acute specialty care services (e.g., cardiac catheterization; stroke; major trauma) to hospital discharge – so that system performance can be measured and assessed.
 - b) Projects are in early states of development to improve processes as a system (e.g., a cross-organizational performance improvement team is in very early stages of measuring performance for heart attacks and cardiac arrests)
- 9) Processes are lacking for coordinated measurement of patient and stakeholder satisfaction in a system with multi-organizational prehospital service delivery (9-1-1 call taking / emergency medical dispatch, MFR services, ambulance services)
- 10) Processes are in place create performance standards for emergency medical dispatch, MFRs, and ambulance provider organizations. However, processes are lacking to monitor, verify, and enforce those standards.
 - a) KCMCA has no enforcement authority at a provider organization level short of asking for State intervention to remove provider organization licensure.

Recommendations

- 1) In consultation with the ambulances and MFRs, choose a process improvement framework(s). This is intended to provide a proven structure with rich sets of support resources, tools and training. It is also intended to provide a level of consistency in the methods used by provider organizations so that joint initiatives, including process improvement training, are easier to plan and manage. Employees from all of the provider organizations will be able to work better on cross-organizational process improvement teams if they are trained and have experience using the same process improvement framework(s).
 - a) Suggested process improvement frameworks – six sigma, lean
- 2) Seek out opportunities with local hospitals and businesses for ambulance and MFR staff to participate in their quality management training programs. Opportunities for experiential

FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011

training/observation in organizations with mature quality management systems would also be very worthwhile.

- 3) Ambulance and MFR managers who will be leading their internal quality management programs would benefit from participation in the local chapter of the American Society for Quality.
- 4) A broader organizational performance improvement framework would also be beneficial for adoption as an EMS system.
 - a) It is recommended that the ambulance and MFR organizations initially work to comply with industry accreditation standards. For ambulances, this would be accreditation from the Commission on Accreditation of Ambulance Services.⁴⁸ For fire departments, it would be the Commission on Fire Service Accreditation International (<http://publicsafetyexcellence.org/agency-accreditation/about-accreditation-cfai.aspx>)
 - b) Once accreditation criteria have been met, an open-ended assessment tool should be considered, such as the Baldrige Criteria for Healthcare Performance Excellence (see below).
- 5) A comprehensive third party review of the overall EMS system using a standardized set of assessment criteria would be beneficial. It would help get an objective view of system strengths and weaknesses relative to the assessment criteria and provide a useful mechanism for gauging progress over time.
 - a) This is different from a site review in an accreditation process. Accreditation site reviews are useful up to the point that the accreditation criteria are passed. After that point, they do not measure progress beyond the pass/fail threshold. A more open-ended set of criteria are desired.
 - b) One option is to contrast the EMS system with the goals outlined in the EMS Agendas for the Future^{49,50,51,52,53} or the Institute of Medicine's 'EMS at the Crossroads' document.⁵⁴ These have the advantage of being very EMS specific. Their disadvantage are they are not specifically designed as criteria for EMS system assessments.
 - c) Another option is to utilize the Baldrige Criteria for Healthcare Excellence.⁵⁵ The principal advantage is that this is intended for use as an assessment tool with associated scoring processes that allows progress to be tracked over time. While it is specific to healthcare, it is not specific to EMS.
 - d) Over time, it may be useful to alternate use of the Baldrige Criteria with the applicable portions of the EMS Agendas.

⁴⁸ Commission of Accreditation of Ambulance Services - www.caas.org (last accessed 11Oct11)

⁴⁹ General EMS Agenda - www.nhtsa.gov/people/injury/ems/agenda/emsman.html (last accessed 11Oct11)

⁵⁰ EMS Education Agenda - www.nhtsa.gov/people/injury/ems/EdAgenda/final/ (last accessed 11Oct11)

⁵¹ EMS Workforce Agenda - www.ems.gov/pdf/2011/EMS_Workforce_Agenda_052011.pdf (last accessed 11Oct11)

⁵² Rural and Frontier EMS Agenda - <ftp://ftp.hrsa.gov/ruralhealth/ServiceChiefsGuide.pdf> (last accessed 11Oct11)

⁵³ EMS Research Agenda - www.nhtsa.gov/people/.../ems/ems-agenda/EMSResearchAgenda.pdf (last accessed 11Oct11)

⁵⁴ EMS at the Crossroads - <http://iom.edu/Reports/2006/Emergency-Medical-Services-At-the-Crossroads.aspx> (last accessed 11 Oct11)

⁵⁵ Baldrige Criteria for Healthcare - http://www.nist.gov/baldrige/enter/health_care.cfm (last accessed 11Oct11)

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- 1) Develop processes to measure performance of the entire system across jurisdictional and institutional boundaries - from the initial 9-1-1 public safety answering point (PSAP) call taking and transfer action; to emergency medical dispatch (EMD); through MFR services; through ambulance services; through emergency department (ED) services; and through any acute specialty care services (e.g., cardiac catheterization; stroke; major trauma) to hospital discharge – so that system performance can be measured and assessed.
- 2) In collaboration with the PSAPs, MFRs and ambulance services, try to choose a single EMS customer satisfaction survey tool or vendor. With the chosen tool/vendor, try to get feedback on the PSAP/EMD, MFR, and ambulance phases of their prehospital care.
- 3) Re-visit any existing performance standards for emergency medical dispatch, MFRs, and ambulance provider organizations in context of current science and best practices.
 - a) Develop processes to regularly collect performance data that allows for review on individual cases, an organization or aggregate to a system level.
 - b) Develop a system for regular reporting of performance results
 - c) Develop processes to verify data submitted by provider organizations
 - d) Develop processes to enforce organizational performance standards at an organizational level.
- 4) Coordinate system-wide quality management efforts via KCMCA that build upon QI data and improvement initiatives within the various EMD centers, MFRs, ambulances and hospitals.
- 5) Work with hospitals to develop processes that automate the provision of outcome feedback to EMS on specified case types (cardiac arrest, ACS, stroke, major trauma). Consider developing ordinances to support this goal if hospital are unable or unwilling to come to consensus and cooperate in a timely manner.
 - a) The City of Tucson may provide a useful example for such an ordinance. They have had an ordinance requiring local hospitals to provide patient outcome feedback to EMS on cardiac arrest cases for decades. This has been a significant factor in their ability to become a world-recognized research center for EMS resuscitation research.

11 SUMMARY

For the sake of brevity, the findings in this report have intentionally focused on shortcomings and opportunities for improvement. This keeps the focus on where the community and the system needs to take action. It is therefore important to point out that Kent County, overall, has a good EMS system. People's lives are positively impacted by the EMS system in Kent County every day. It is not in any acute distress requiring immediate interventions to protect patients, prevent operational collapse, or rescue it from any financial insolvency.

While there is almost always some level of conflict between stakeholders in any EMS system, it is at a very manageable level in Kent County. Parties may disagree on issues, but there is a refreshing level of civility in how the individual and organizational stakeholders here interact. This is an extremely important positive finding that is difficult to fully appreciate until one has had the opportunity to spend time closely examining other EMS systems. This aspect of the EMS system's 'culture' in Kent County is one of its most valuable assets.

Unfortunately, there is little objective evidence at a system-level to speak to the system's clinical efficacy or economic efficiency. Part of the problem is that most other systems also lack credible information on their clinical efficacy or economic efficiency, making objective comparisons very difficult at best. One of the few system-level measures being monitored by multiple systems across the United States is the cardiac arrest survival rate. The results from the first year of tracking in Kent County is very respectable in comparison to other EMS systems.

It is possible to have a good system in spite of a weak system design if you have great people. The success of the system to date is a credit to the great managers and front line staff who work hard every day to make it all happen. However, the limitations of the system design are getting in the way of better performance.

The best news is that there are several controllable factors in the system design that can be changed to help facilitate better performance. One of the biggest and most difficult to overcome in making the system dramatically better is that the system is not 'broken.' The quote below from Jim Collins speaks to the problem of making a *good* EMS system better.

Good is the enemy of great. And that is one of the reasons that we have so little that becomes great. We don't have great schools, principally because we have good schools. We don't have great government, principally because we have good government. Few people attain great lives, precisely because it is easy to settle for a good life. The vast majority of companies never become great precisely because they become quite good. - and that is their main problem.

– Jim Collins in "Good to Great: Why Some Companies Make the Leap... and Others Don't."

Kent County has a *good* EMS system. It clearly has the potential to be far better. A great EMS system takes the available dollars and other resources and uses them effectively and efficiently to yield high levels of clinical and operational performance along with high levels of citizen, patient, and field provider satisfaction. The elected and senior appointed officials of the municipalities in Kent County have an extraordinary, but time limited, opportunity to catalyze significant improvements in their EMS system that raise the level of EMS service in their communities without the need to raise taxes. The resources and talent are already here.

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

It is not an issue of cost, it is an issue of leadership and political will. A suggested course of action has been outlined in the various recommendations of this report and in the recently adopted Strategic Plan for the KCMCA, which is included in Appendix 1.

12 APPENDIX

1. KCEMS Strategic Plan (Adopted 13Sep11)
2. Findings and Recommendations to the Kent County EMS Medical Control Authority, November 2010

APPENDIX 1 – KENT COUNTY EMS STRATEGIC PLAN (ADOPTED 13SEP11)

Mission Statement⁵⁶

Improve EMS system performance in the communities we serve

Vision Statements⁵⁷

1. Regularly provides reports on clinical and operational performance of the overall EMS system based on data aggregated from PSAPs, MFRs, ambulances, and hospitals, to include their emergency departments and emergency specialty care services
2. Leads system-level improvement initiatives
3. Supports provider organization improvement initiatives
4. Establishes, monitors and reports on compliance with clinical and operational performance standards established in collaboration with the cities, townships and counties in its service area
5. Has an organizational structure free of real or perceived conflicts of interest
6. Has an organizational structure with clearly described roles and responsibilities in governance and operations
7. Supports individual professional development in EMS
8. Frequently and regularly communicates in a wide variety of formats convenient to stakeholders
9. Catalyzes development of activities and services that attract high caliber professionals to work in Kent County
10. Regularly contributes to the academic knowledge base through publications and presentations
11. Has consolidated, virtually and/or legally, with other MCAs by leveraging KCEMS' resources for mutual benefit

⁵⁶ The mission statement describes the reason / purpose / need that KCEMS exists for. The mission, in most circumstances, remains relatively constant over time.

⁵⁷ Vision statements describe the attributes, products, services, activities, or performance that KCEMS envisions to achieve in order to fulfill its mission. Achievement should be determined by reaching an objectively measured target or being in position where independent observers would be likely to conclude that the item from the vision statement item has been achieved. As an organization approaches achievement of a vision statement, new ones should be developed to keep the organization striving to improve.

Strategy⁵⁸

The items below are tied to specific proposed vision statements.

1. RE: “Regularly provides reports on clinical and operational performance of the overall EMS system based on data aggregated from PSAPs, MFRs, ambulances, and hospitals, to include their emergency departments and emergency specialty care services”
 - 1.1. Develop system-level clinical and operational performance indicators
 - 1.2. Develop provider organization-level performance indicators that can roll-up to system-level performance indicators
 - 1.3. Assist provider organizations in implementing and reporting their clinical and operational performance indicators
 - 1.4. Develop and implement processes to aggregate performance data from field and provider organizations and hospitals into system performance data
 - 1.5. Develop system level reports – report cards and trend reports
 - 1.6. Develop, purchase or contract for a business intelligence / dashboard / scorecard solution that can also be accessed by provider organizations
 - 1.7. Design system level performance dashboards and trend reports
 - 1.8. Design standardized provider agency performance dashboards and trend reports
 - 1.9. Establish external accountabilities
 - 1.9.1. Share system-level performance reports with provider organizations, government leaders and media, as well as making them accessible to the general public
 - 1.9.2. Issue an annual report outlining system performance, progress and challenges
2. RE: “Leads system-level improvement initiatives”
 - 2.1. Create process for proposing system level improvement initiatives
 - 2.2. Establish a system-level performance council to review, approve, oversee and support system-level performance improvement initiatives
 - 2.3. Lead system-level improvement projects
3. RE: Supports provider organization improvement initiatives”
 - 3.1. Provide or facilitate access to performance improvement training to provider staff members
 - 3.2. Provide an overall performance improvement program template for internal use by ambulance services and MFRs
 - 3.3. Provide quality assurance templates for specific processes to ambulance services and MFRs
 - 3.4. Create a process for provider organizations to notify the MCA of clinical performance improvement initiatives as a way to avoid unproductive duplication, identify potential synergies and opine from a medical oversight and system perspective
4. RE: “Establishes, monitors and reports on compliance with clinical and operational performance standards established in collaboration with the cities, townships and counties in its service area”
 - 4.1. Work with cities, townships and the County to establish clinical and operational standards.
 - 4.2. Develop processes to generate and disseminate reports on performance against the clinical and operational standards to the cities, townships and the County
 - 4.3. Develop reports on key performance measures limited to the area covered by each city, township and the unincorporated areas of the County on key performance measures not related to clinical or operational standards (e.g., cardiac arrest survival rate; rate of bystander

⁵⁸ The strategy statements express the ways that KCEMS will try to fulfill its vision.

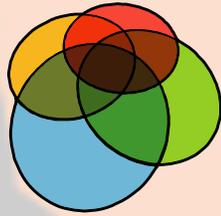
**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

- and AED utilization – neither of which would likely be specified in performance or operational standards)
5. RE: “Has an organizational structure free of real or perceived conflicts of interest”
 - 5.1. Develop a set of options for changes in the organizational and/or decision-making structure of KCEMS to resolve or minimize real or perceived conflicts of interest
 - 5.1.1. Work with cities, townships, the County and the KCEMS Governing Board to choose and implement an option
 6. RE: “Has an organizational structure with clearly described roles and responsibilities in governance and operations”
 - 6.1. Develop a set of guidelines and job descriptions that define and differentiate the roles and responsibilities between the Governing Board, Executive Board, Board President, Medical Director and Executive Director
 - 6.2. Review and update KCEMS articles of incorporation and bylaws to reflect changes in KCEMS
 7. RE: “Supports individual professional development in EMS”
 - 7.1. Offer elective CME content
 - 7.1.1. YUCKS conferences / Clinical lecture series
 - 7.1.2. Clinical video blog
 - 7.1.3. Clinical journal club
 - 7.1.4. Clinical directed readings group
 - 7.1.5. Clinical education resource page (with links to external resources)
 - 7.1.6. Seek permissions for EMS personnel to attend specific physician residency program activities
 - 7.1.7. Seek permissions that would allow local EMS providers to audit specific medical, nursing and allied health courses or lectures therein
 - 7.2. Offer EMS management education / continuing education services
 - 7.2.1. Offer a management oriented paramedic fellowship program
 - 7.2.2. Offer management oriented continuing education programs
 - 7.2.2.1. EMS Management Lecture Series
 - 7.2.2.2. EMS Management Video Blog
 - 7.2.2.3. EMS Management Journal Club
 - 7.2.2.4. EMS Management Directed Readings Group
 - 7.2.2.5. EMS Management Education Resources Links
 - 7.2.2.6. EMS Management Academy
 - 7.2.3. Seek permissions for EMS personnel to audit specific MBA / MHA / MPH/ MPA courses or lectures therein
 - 7.3. Work with provider agencies and academic partners to establish bridge programs that allow participants to work in EMS while attending school
 - 7.3.1. Paramedic to MBA / MPH / MPA
 - 7.3.2. Paramedic to PA
 - 7.3.3. Paramedic to MD/DO
 8. RE: “Frequently and regularly communicates in a wide variety of formats convenient to stakeholders”
 - 8.1. Hold regularly scheduled town hall meetings w/ Medical Director and KCEMS staff
 - 8.2. Develop robust website
 - 8.2.1. Tablet and mobile device compatible
 - 8.3. Publish a monthly e-newsletter
 - 8.4. Tweet MCA and system announcements and news blasts
 - 8.5. Create a system wiki for reference information, frequently asked questions, and to archive institutional/system knowledge

**FINDINGS AND RECOMMENDATIONS ON EMS
IN KENT COUNTY – NOVEMBER, 2011**

9. RE: “Catalyzes development of activities and services that attract high caliber professionals to work in Kent County”
 - 9.1. See 6.4 (Work with provider agencies and academic partners to establish and paramedic bridge programs that allow participant to work while attending school)
 - 9.2. Work with medical school and hospitals to develop an EMS Physician Fellowship program
 - 9.3. Work with local EMS providers and colleges to develop an EMS management fellowship program
 - 9.4. Work with local EMS providers and colleges to develop advanced track CME program
 - 9.5. Work with public health department, hospitals, payers and local EMS providers to develop community paramedicine program
10. RE: “Regularly contributes to the academic knowledge base through publications and presentations”
 - 10.1. Include publication and presentation activity in MCA performance metrics
 - 10.2. (See EMS Physician and EMS Management fellowship program items)
 - 10.3. Conduct an EMS journal club to develop academic medicine skills among field providers
11. RE: “Has consolidated, virtually and/or legally, with other MCAs by leveraging KCEMS’ resources for mutual benefit”
 - 11.1. Resolve local organizational issues (e.g., governance conflicts of interest) before reaching out to other MCAs
 - 11.2. Develop scalable infrastructure
 - 11.2.1. Transition to cloud-based document storage and applications platforms
 - 11.2.2. Build self-serve resources where possible and practical (e.g., ID card services)
 - 11.3. Develop documents, policies, etc. in formats that lend themselves to being used as templates for others to use/adapt
 - 11.4. Develop organization model, in consultation with legal counsel, for an MCA structure that covers multiple counties

**APPENDIX 2 – FINDINGS AND RECOMMENDATIONS TO THE
KENT COUNTY EMS MEDICAL CONTROL AUTHORITY
(NOVEMBER 2010)**



IPSS

**FINDINGS AND
RECOMMENDATIONS TO THE
KENT COUNTY EMS MEDICAL
CONTROL AUTHORITY**

NOVEMBER 2010

Mid-Atlantic / Main Office:
5544 Whisper Creek Ln.
Wilmington, NC 28409
919-656-5700

Southeast Office:
PO Box 2128
Lakeland, FL 33806
863-838-3295



FINDINGS AND RECOMMENDATIONS TO THE
KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

TABLE OF CONTENTS

I. Challenges	3
II. Findings and Recommendations	3
A. Mission and Vision	3
B. Services	6
C. Governance / Management Structure.....	8
D. Funding	10
E. Staff.....	11
F. Medical Oversight.....	12
G. Quality Management	14
H. Continuing Medical Education.....	17
I. EMS Systems.....	18
III. Implementation Plan.....	20



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

I. CHALLENGES

During the course of this project, IPS reviewed a wide array of documents; held various stakeholder group and one-on-one meetings; made visits to hospitals; had impromptu conversations with ED staff and field crew members; and visited ambulance service provider offices. These activities took place on three separate site visits. These activities led IPS to identify the following major challenges now confronting the KCEMS MCA*:

1. Lack of definition of the MCA’s mission, vision, and the value it provides to EMS providers, receiving hospitals, and the community at large
2. As the lead agency of the EMS ‘system’ as defined by its MCA service area, a lack of definition of a vision for what the EMS system should aspire to become by some defined point in the future
3. Lack of accountability for demonstrable progress toward agreed upon goals
4. Lack of accountability for performance as an MCA
5. Lack of clarity on the specific services that the MCA provides
6. Lack of communication between the MCA and the various EMS and healthcare stakeholder groups
7. Lack of clarity on the types of knowledge, skills and qualifications that will be needed for new and/or redesigned MCA staff positions to support its own vision and goals
8. Concerns about the readiness of the MCA to become a regional MCA
9. Potential instability in MCA funding based on voluntary payments of assessments by hospitals, ambulance services and medical first responders
10. Potential conflicts of interest in MCA board decisions where the interests of hospitals, ambulance providers, medical first responders may not coincide with the interests of the EMS system and the communities it serves.
11. Need for strong leadership to drive the system towards fulfilling its vision for becoming a model of EMS system excellence – and recognized as such – locally, regionally, nationally, and throughout the EMS, healthcare and public safety communities.

II. FINDINGS AND RECOMMENDATIONS

A. MISSION AND VISION

1. FINDINGS

- A text file named “KCEMS Visioning Doc.pdf” is titled “Kent County EMS Short Term Strategic Plan” within the text of that document. The Board suggested that this document still reflected its general thoughts for elements in KCEMS mission and vision statements.

Although KCEMS is the abbreviation used to refer to the MCA, abbreviation ‘MCA’ will be used to refer specifically to the MCA while ‘KCEMS’ will refer to the EMS system that is overseen by the MCA.



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- The Kent County EMS Short Term Strategic Plan states the MCA’s mission as follows:
“To provide for optimal care for the ill or injured patient through continued development of an emergency medical services system in the Kent County Medical Control Region which will include plans for the implementation and provision of:
 - *A coordinated emergency medical services system*
 - *The dispatch of emergency medical services resources*
 - *The treatment and transportation of persons in need of pre-hospital medical care in the most prompt and efficient manner possible*
 - *A coordinated medical response to mass casualty and disaster situations*
 - *Educational programs necessary to maintain the expected level of patient care*
 - *Liaison with governmental agencies*
 - *Other activities as dictated by the KCEMS Governing Body or the Michigan Department of Community Health”*
- For a vision, the Kent County EMS Short Term Strategic Plan states, “...be the national model of EMS System excellence.”
- The goals section of the Kent County EMS Short Term Strategic Plan gets into more detail regarding a strategy for achieving of the vision, although many items listed are at a more tactical than strategic level. The broader goals of a more strategic nature include:
 - “Identify our statutory responsibilities and evaluate our performance”
 - “Yearly report to the community on the performance of the system”
 - “Provide a comprehensive assessment on how KCEMS is addressing the attributes identified in the EMS Agenda for the Future”
 - “Regional MCA - How to position KCEMS so as to be in the best position to be a regional MCA should the State integrate MCAs into the 8 Regional planning districts that are consistent with the proposed Regional Trauma Networks.”
 - “Implementation of the QI plan” but the plan to which it refers is not clear.
 - Reference is made to cardiac arrest survival rates and response times. It specifies, “Identify where we are, where we want to be, and how to get there.”
 - “Identify what processes need to be in place in order to be involved in EMS research”
- There is no evidence of a specific plan that outlines how to get from the current state to the desired future state on any of the items.
- The individual vision statement items are not associated with things that can be objectively assessed as to see what demonstrable progress the organization is making to fulfill the vision.

2. RECOMMENDATIONS

- Based on the conversations with KCEMS Board members; conversations with people who work within the KCEMS system; and the various mission, vision and strategic planning related documents that have been generated by KCEMS over the past several years – the sentiment and intent is clear. It might be concisely summarized as “Building and leading EMS systems of demonstrable excellence”
- Consistent with the above mission statement and sentiments expressed the Kent County EMS Short Term Strategic Plan, the following broad vision statement goals and associated measurable parameters and timeframes are suggested:



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- GOAL: Measure, improve, and report on the performance of the KCEMS MCA
 - Within 1 year, develop and implement performance indicators specific to the MCA
 - Within 1 year, conduct a baseline assessment of the MCA using the Baldrige Criteria for Performance Excellence (Michigan or the national version)
 - Within 3 months, begin self-assessment using the various 'getting started' tools provided on the Self-Assessment page at the Baldrige site (<http://www.nist.gov/baldrige/enter/self.cfm>)
 - Within 1 year, give the first annual report to the EMS providers and receiving hospitals on KCEMS MCA performance; Include the media and governmental entities in future reports.
 - Within 3 years, show a net positive trend in a composite score that includes all of the process specific MCA performance indicator metrics.
 - Within 5 years, show net positive trends in the 7 sections and the overall Baldrige score for the MCA
- GOAL: Measure, continuously improve, and report on the aggregate performance of patient and community services delivered by the KCEMS 'system'
 - Within 1 year, develop a comprehensive array of EMS performance indicators and/or performance criteria that cover all 14 areas outlined in the EMS Agenda for the Future and/or the IOM EMS at the Crossroads report
 - Within 2 years, complete implementation of the EMS performance indicators and criteria that cover all 14 areas outlined in the EMS Agenda for the Future and/or the IOM EMS at the Crossroads report
 - Within 5 years, show net positive trends for 75% or more all EMS performance indicators that cover all 14 areas outlined in the EMS Agenda for the Future and/or the IOM EMS at the Crossroads report
 - Within 5 years, show net positive trends in survival rates from cardiac arrest
 - Within 5 years, show net positive trends in response interval performance to AMPDS Echo-level calls
 - Within 5 years, show net positive trends in preventable injury performance indicators
- GOAL: Become a center for EMS research and innovation
 - Within 5 years, produce scientific publications and/or presentations on EMS research, performance improvement, or other types of innovation projects for national/international journals and/or conferences at a pace of at least 4/yr.
 - Within 3 months, identify and launch at least one specific clinical performance improvement project. The might include some specific aspect of resuscitation (e.g., measure and reduce chest compression interruptions) or STEMI care (e.g., measure and increase the % of chest pain cases of suspected cardiac origin cases that get 12 lead ECGs and/or aspirin in the field; measure and reduce the % of cases that get supplemental oxygen when the pulse ox value is greater than or equal to 94%)
 - Within 6 months, complete at least one of the performance improvement projects and submit it for presentation at a national



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- conference and/or submit it as an article for publication in a national trade magazine or scientific journal.
- Within 1 year, complete and publish or present on at least one more project (total of 2)
- Within 2 years, have a total of least 4 projects completed and published/presented.
- Within 3 years, have a total of least 8 projects completed and published/presented.
- Within 4 years, have a total of least 12 projects completed and published/presented.
- GOAL: Integrate the MCAs within the region into a single MCA -or- form a functionally consolidated MCA network united by collaboration and infrastructure that is centrally managed and operated by the KCEMS MCA
 - Within 6 months, identify the elements of MCA operations that can be done on a remote basis versus those that need to be done locally.
 - Within 1 year, develop a plan for KCEMS to begin offering services to other MCAs that can be done remotely.
 - Within 1 year, develop a re-branding strategy that accommodates a broader area than Kent County and have it implemented within 18 months
 - Within 2 years, begin offering some services to other MCA in the region
 - Within 5 years, complete regional consolidation into a single MCA based out of the KCEMS MCA -or- have 50% or more of the MCAs in the region functionally consolidated into the KCEMS MCA.

B. SERVICES

1. FINDINGS

- Among members of the MCA Board, there wasn't a clear impression of exactly what services and value that the MCA provides. Similarly, various members of the EMS community were unclear on what services and value that the MCA provides.
- Based on the information that was provided and inferred from conversations, the following list attempts to cover the range of services now provided by the KCEMS MCA:
 - Protocol development / revisions
 - State protocol waiver applications
 - System credentialing
 - System activity statistics (limited)
 - Clinical outcome data collection (very limited)
 - Hospital notification services (MEDCOM)
 - Drug bag program
 - EMS compliant management (limited)
 - Medical Director visits with ambulance services
 - Medical Director visits with MFRs (very limited)
 - Practical skills assessments
 - Protocol testing (for initial credentialing)
 - Medical Response Corps grant program support



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- AED program services for non-EMS entities
- Run report form services
- Special project management (e.g., CPAP program development)(limited)
- EMS rotation program for EM residents
- KCEMS website (limited)
- There does not appear to be much of any accountability or measurement of how well or how efficiently any of these services are provided.

2. RECOMMENDATIONS

- The Board's general goal of becoming a "national model of EMS system excellence" is achievable, but will require strong strategic and tactical leadership, resources, focus and commitment – along with very disciplined efforts in close collaboration with local EMS providers, hospitals, academic centers, local businesses, and local government entities.
- The basic ingredients are all here in good measure – a legislative mandate for MCAs; robust local medical and academic resources; local hospital support; local EMS provider support; funding; very little existing infrastructure to change (most of it is already gone), and a general acknowledgement from most everyone involved that the MCA needs to significantly change.
- Given the above paragraph and based on the general themes and intent of the mission and vision section of this document, the following services are suggested for consideration (some, but not all, of the items from the services listed in the 'Findings' section are carried over to this list):
 - State Protocol waiver applications
 - Derived from QI and research project initiatives
 - Derived from enhancements / improvements that can be made on the State format
 - EMS orientation program for ED staff
 - Online medical control training for ED physicians
 - QI process for online medical control
 - System credentialing of field providers
 - System activity statistics based on aggregated data from all levels of providers and citizen interventions
 - Clinical outcome data collection
 - Hospital notification services (MEDCOM)
 - Drug bag program
 - EMS compliant management / Professional Standards Review Organization activities
 - Medical Director 'town hall meetings' with ambulance service and MFR field personnel
 - Medical Director 'roundtable sessions' with ambulance service and MFR managers
 - Practical skills labs
 - Protocol testing for initial credentialing
 - 'Diagnostic' didactic testing to drive QI and education priorities
 - Medical Reserve Corps program support
 - AED program services for non-EMS entities
 - Run report form services
 - Robust EMS rotation program for EM residents



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- Establish and actively update a listing of discrete short time frame research projects suited to be completed by EM residents, with MCA staff supervision, during their EMS rotation
- Special project management (e.g., CPAP program development)
- MCA to EMS provider communications services
 - Robust website
 - Electronic newsletter on MCA and KCEMS activities, performance, and educational content
 - Social media
 - MCA Twitter handle and hash tag for KCEMS
 - Facebook page for KCEMS
 - Podcasts (audio) and v-casts (video), Twitter feeds, and Facebook entries derived from electronic newsletter content, MCA and ‘system’ announcements, event dates, performance / activity stats

C. GOVERNANCE / MANAGEMENT STRUCTURE

1. FINDINGS

- The State legislation for MCAs places primary responsibility on the local hospitals for creation of the MCAs. Given the situation and level of system evolution decades ago when this legislation was enacted, that approach that was fitting with the then-popular paradigm of trying to offer hospital emergency room services via the ambulances. This may still seem reasonable, but it is important to recognize the potential for conflicts of interest when hospitals are empowered to develop and enforce EMS system policies. When hospitals are empowered to make EMS system policy, they are susceptible to favor the interests of hospitals over the interests of the EMS system and the overall community (e.g., hospital destination and bypass policies). Since the KCEMS Board grants representation and voting rights to ambulance services, a similar dynamic is in place that may also lead to conflicts of interest regarding ambulance services (e.g., deciding if a new ambulance provider will be allowed to enter the local ambulance market).
 - Instances of such conflict in the MCA have *not* been brought to the consultant’s attention. The MCA may simply have been fortunate enough to have good people and well intentioned organizations involved up to this point.
- There is a problem in the MCA governance process design where the MCA’s are “supervising and coordinating the local EMS system” but the local government entities that can pass “ordinances regulating ambulance operations, nontransport prehospital life support operations, or medical first response services” are not involved in the MCA – through Board seats or advisory council representation.
 - The MSCH website (http://www.michigan.gov/mdch/0,1607,7-132-2946_5093_28508-132260--,00.html) states “A Medical Control Authority (MCA) is an organization designated by the department for the purpose of **supervising and coordinating an emergency medical services (EMS) system**, as prescribed, adopted, and enforced through department-approved protocols for a particular geographic region.”



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- Michigan’s Public Health Code, section 333.2948, sub-section (3) states, “A local governmental unit may enact an **ordinance regulating ambulance operations, nontransport prehospital life support operations, or medical first response services**. The standards and procedures established under the ordinance shall not be in conflict with or less stringent than those required under this part or the rules promulgated under this part.”
- Attendance at monthly Board meetings is very inconsistent.
 - There are no consequences, per se, for failure to attend or participate
- Momentum on activities and decisions made at the MCA Board meetings seems to rapidly dissipate afterwards.
 - Little evidence of substantive activities being conducted by the board remotely (e.g., via email or conference call) between monthly meetings

2. **RECOMMENDATIONS**

- It would be far better to resolve the potential conflict of interest issues and thereby prevent problems rather than have to react to them during or after the fact.
 - The MCA and the local community has limited ability to catalyze change at the State level in the short to medium term on this issue. Therefore, the MCA should lead by example and consider ways to work around the State language for MCA governance to prevent and/or mitigate any real or perceived conflicts of interest.
 - Consider placing a level of separation between the MCA and the body responsible for actual policy development and enforcement.
 - This could take the form of a separate Professional Services Office (working title) that would carry out most of the MCA’s responsibilities behalf of the Board. Because the MCA Board would still exist and oversee the PSO, State requirements under MCL 333-20918 - Paragraphs 1-4 would still be met. When PSO action on items with the potential for conflict of interest from the Board are involved and the requirements for ‘permitted’ PSO actions are met, the Board approval would be ‘automatic’ or the decision is simply delegated to the PSO – to mitigate real or perceived interference from the Board.
 - Instead of a PSO, the functional responsibilities of the MCA could be placed into an academic institution, such as the local medical school’s emergency medicine program. This is a common arrangement throughout the United States and Canada. Locally, it is the arrangement between the Kalamazoo MCA and their local medical school.
 - The relationships between the local medical school and particular local hospital(s) could also create a perceived or real conflicts of interest in a competitive hospital market. Therefore, the PSO approach may be preferable.
- Consideration should be given to some form of formal representation from governmental entities on the MCA Board or with some type of advisory / liaison representation.
 - This may also relate to this issue of governmental funding of MCAs, which is discussed in more detail in the ‘Funding’ section of this report.



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- Consider MCA Board policies that would prompt notification to the CEO and/or Boards of Directors of institutional representatives when their representative fails to meet some criteria for minimum attendance / participation expectations.
- Use technology for remote discussion and voting to help sustain Board engagement between monthly meetings (e.g., email, conference calls, multi-media virtual meeting platforms [e.g. WebEx, GoToMeeting, etc.]

D. FUNDING

1. FINDINGS

- Funding for KCEMS primarily comes from ‘assessment’ fees charged to the entities that are regulated by KCEMS – i.e., local hospitals and EMS provider organizations. Payment of these assessment fees is voluntary. The consequences of making decisions in the best interests of the overall community can be in conflict with the preferences of the regulated entities. This can create a dynamic in which KCEMS decisions and policies are tempered by inappropriate consideration of the potential reactions of a voluntary payer. This ties into the potential conflicts of interest addressed in the prior report section on Governance.
- There appears to be a balance of \$500,000 or more that the MCA now holds in its reserve fund that significantly exceeds the target of an amount equal to 25% of the annual budget (\approx \$125,000) in reserves. Given the amount now held in excess of the target, the Board will need to determine how to manage it.

2. RECOMMENDATIONS

- Funding for KCEMS should not be subject to the uncertainties or potentially inappropriate influences of voluntary payments from the entities that the MCA is supposed to be regulating. The voluntary nature of KCEMS funding could be addressed by any or a combination of several alternatives:
 - Given its quasi-governmental role that serves the interests of all citizens in the entire catchment area covered by KCEMS, consider development of tax-funded support of MCA operations via the local governments. However, given the current economic climate, creating a new tax or drawing on the general funds for MCA services in all of the covered communities is unlikely to gain much support.
 - Consider an arrangement with local cities and counties where they work together, or separately, to allocate EMS market rights and collect fees from receiving hospitals and/or EMS providers. These funds would be passed-through to KCEMS to fund its operations.
 - As an example of this, the City of Kalamazoo has allocated market rights through a performance contract that mandates the contractor to pay its share of fees to support the local MCA.
 - This would be a long term and politically complicated process. Therefore, this is not recommended for the short to medium term.
 - Consider long-term automatically renewing contracts between KCEMS and the entities that now pay voluntary assessments. These contracts would include financial



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

obligations that would be less susceptible to inappropriate influences, versus the current voluntary assessment payment process.

- Options for use of excess reserve funds
 - Adjust the amount of funds to be kept in reserves. The Board should discuss what the reserve amount needs to be based on the intended purpose of the reserves and then set the reserve target accordingly. The current target is an amount equal to 25% of the annual budget (based on Board discussions at the September meeting)
 - Fund any one-time transition costs to facilitate desired changes to the MCA. This should be considered after the findings and recommendations of this report have been fully reviewed by the Board and a strategy for moving forward has been chosen.
 - Create a research / QI project endowment (utilize earnings on the principal for funding projects without depleting the endowment's principal)
 - The most politically popular and expedient approach would be to roll back assessments to allow reserves to deplete to a specified level over a specified period of time. This is not recommended as it would squander a unique opportunity to do something extraordinary to advance the MCA and KCEMS with the funds.

E. STAFF

1. FINDINGS

- MCA office staffing is now at a minimal level – in anticipation of a new plan of action in follow-up to this report.
- Current staffing and salaries
 - Medical Director – 14 hrs/wk (≈\$96K)
 - Deputy Medical Director – 6 hrs/wk (≈\$42K)
 - Quality Assurance Coordinator – 1 FTE (≈\$70K with benefits)
 - Executive Director - VACANT (≈\$84K with benefits)
 - Total ≈\$208K (≈288K with Exec. Dir. position)

2. RECOMMENDATIONS

- Staffing suggestions listed below are derived from the vision > strategy > products and services proposed to be offered. They represent a starting point. The staffing needs should be reevaluated in 6 months and at 12 months in light of progress made with these initial resources and the capacity of the MCA to appropriately use more resources or to consider reducing resources with a smaller and more manageable scope of services. Salary/benefits package amounts are also suggested for initial budgeting purposes:
 - Medical Director – 20 hrs /wk total ('10-99' or institutional contract positions; Hours to be divided between the Medical Director and Deputy Medical Director as needed)
 - \$135/hr x 20 hrs x 52 wks = 140.4K total cost
 - The intent reflected by this modest amount of physician time is to focus their efforts on activities that are best handled exclusively by physicians



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- rather than appropriately qualified and managed non-physician staff members
- Executive Director – 90K/yr plus benefits
 - Using 30% of salary as a benefits factor = \$27K
 - 90K salary + 27K benefits = 117K total cost
 - This higher salary level is suggested to attract and retain someone who can lead the MCA on a day to day basis and be capable of doing many of the ‘heavy lifting’ tasks associated with the scope of services envisioned for the MCA. This salary level probably too low for what is expected, but can be where the Board begins. Increases should be very strongly considered to help retain someone who demonstrates a high level of demonstrable performance in the position.
 - Office Coordinator / Project Coordinator – 35K/yr plus benefits
 - Using 30% of salary as a benefits factor = \$10.5K
 - 35K salary + 10.5K benefits = 45.5K total cost
 - Service Inquiry Manager / Education Coordinator – (0.5 FTE) – 25K/yr plus benefits
 - Using 30% of salary as a benefits factor = \$7.5K
 - 25K salary + 7.5 K benefits = 32.5K total cost
 - The amount of time allocated to this position could be increased as the whole education strategy evolves – and with demonstrable performance to justify more staff time. Consideration should be given to making the education services component able to generate revenue to help offset costs.
 - Performance Improvement Analyst (‘10-99’ position; 0.5 FTE) – 25K/yr
 - This can be contracted in many different ways to several different local advanced degree students and independent quality management professionals – or to just one person
 - Professional Services Contracts (‘10-99’ personnel for computer programming, specialized statistical services, IT support, web, video, new media and other services)
 - 50K/yr
 - Total = 410.4K/yr

F. MEDICAL OVERSIGHT

1. FINDINGS

- The newly standardized State protocols reduce a significant responsibility of the Medical Director.
- There will be a need for local/regional MCAs to request waivers for some types of research, quality improvement projects, local policy items, and format modifications.
 - As the art and science of EMS changes, the official State protocols will need to be updated. Local MCAs will likely have a desire to implement some of those changes well in advance of any ‘official’ changes.
 - There will be an on-going need to make improvements in protocol formats and ancillary support materials.
 - Those locally generated protocol change items will need to be submitted to the State in the form of waivers.



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- Direct medical control (clinical consultations between field providers and physicians) is provided by the receiving ED physicians via radio.
- Very few of the field to hospital communications involve physician consultations.
- Of the field provider to physician communications, many of them are reported to be for purposes of verifying that certain criteria are met and capturing that verification in an audio recording (e.g., terminations of resuscitation; some types of refusals of care)
- There is only one level of clinical privileges for paramedics, regardless of demonstrated knowledge, skills, experience or other merit. Therefore, the thresholds for requiring contact to online medical control are the same for all paramedics – which thwarts an opportunity to promote clinical excellence.
- The receiving ED physicians do not receive any formal training / orientation to the local EMS system and its protocols, policies and procedures.
- There is no quality management process for direct medical control activities.
- Direct medical control communications and hospital notification of incoming ambulance patients are facilitated by paramedics working at MEDCOM, which is housed at the air medical dispatch facility.
- Currently, most MEDCOM activities are of a more perfunctory / mechanical nature.

2. **RECOMMENDATIONS**

- Develop and implement performance indicators that reflect on the quality/performance of the direct medical control and hospital notification process.
- Consideration should be given to contracting / eliminating or expanding the scope of activities and services provided by the MEDCOM process
 - *Reduce / Eliminate Option:*
 - The perfunctory / mechanical processes could probably be automated or performed by some other means at significantly less cost.
 - *Expand Option:*
 - Significantly more value could be gained from having appropriately trained and qualified paramedics in the MEDCOM positions – beyond their performance of simple perfunctory / mechanical processes.
 - The MEDCOM paramedic positions could be redesigned to provide a concurrent data collection process for sentinel events and selected sets of cases with detailed data collection needs for purposes of research or quality improvement. The MEDCOM staff person would look up or call in to get information from the 9-1-1 CAD, ambulance CAD, MFR CAD, and call the crew and ED staff shortly after the call with field crews and the receiving ED staff to get specific information. Specific case types for data gathering by MEDCOM might include:
 - Cardiac arrest
 - Chest pain of suspected cardiac origin
 - Suspected stroke
 - Instances where ventilatory support and/or an airway adjunct was used
- Develop and implement a concise training module for emergency department staff members that describes the EMS system, the MCA, protocol highlights, and other key topics.



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- Make the module flexible so that it may be given at a staff meeting or viewed online.
- Consider establishing different levels of authorization that recognize different knowledge /skill / experience / continuing education /professional development levels among paramedics. Those with higher levels of authorizations may have:
 - Different thresholds for when medical control must be sought
 - Different drugs or equipment authorizations, particularly with items new to the system (e.g., may be used / evaluated initially by the higher level clinicians before release to all)
- Develop testing processes to address three different issues:
 - Does the individual meet minimum knowledge and skill levels to obtain 'basic' clinical privileges for their state certification level
 - Does the individual exceed minimum knowledge and skill levels to an extent that they may qualify for higher levels of clinical privileges (a decision that should also consider other factors)
 - As an entirely separate testing process, develop a 'diagnostic' test that determines a person's relative strengths and weaknesses from a didactic standpoint. That information can be used to help formulate a personalized didactic CME 'prescription'

G. QUALITY MANAGEMENT

1. FINDINGS

- The MCA performs rudimentary performance analysis on a very limited set of system data. The analysis is now limited to very basic descriptive measures.
- There does not appear to be a process for aggregating data from ambulance companies, MFRs, and 9-1-1 centers for system performance analysis.
 - There are significant limitations in processes now used to gather 'system' performance data in electronic formats directly from the providers.
 - Some very simple descriptive system data collection is performed for the MCA via the staff at MEDCOM.
- All EMS providers are supposedly participating in the State of Michigan data collection system (built on an ImageTrend system specifically for the State of Michigan)
- There appears to be significant problems in data quality for what is collected electronically and uploaded to the State system - and then made available for access by the MCA.
- The incumbent quality improvement coordinator and medical director do not have any substantive quality management training. Their proficiency level in quality / performance improvement methodologies is very limited, which has severely limited productivity.
 - The incumbent medical director does have some research experience, which is directly pertinent to the design and management of quality/performance improvement projects – and goes beyond what any physician would have from their undergraduate and medical school training in the scientific method.
- There is little evidence of any demonstrable performance improvements that have been made through formal quality management projects by the MCA.
- There does not appear to be a formal process for quality management in place at the MCA.



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- Some chart reviews for quality assurance and individual field staff member feedback purposes are provided by the Medical Director and Deputy Medical Director.
- On an as requested basis, the Medical Director and Deputy Medical Director will ‘manually’ obtain clinical outcome information from the local hospitals with whom they have clinical staff appointments.
 - Cardiac arrest data, including outcomes, is being tracked using the CDC-sponsored CARES program. The local hospitals are participating by entering hospital data into the CARES database via web interfaces by their own staff members.
 - There does not appear to be any ‘hardwired’ feedback loops between EMS and local hospitals on the performance of STEMI, stroke, or major trauma
- The overwhelming majority of EMS quality management activities are performed by the ambulance companies.
- The level of impact and sophistication of the quality management programs at the ambulance companies varies significantly. One service is severely hampered by their lack of electronic PCR data access. Another has one FTE assigned to QA activities along with other duties, but that incumbent has not had any formal training in quality management. The remaining program is moderately evolved, but has quite way to go before getting to a level where it provides demonstrable cause and effect impacts on dependent variables of clinical or operational performance.
 - The chart review processes at the various ambulance companies seem to be more subjective than objective.
- The ambulance companies now perform emergency medical dispatch functions using Medical Priority Dispatch System (MPDS)TM tools with associated MPDS case review processes and medical oversight from the MCA.
 - The emergency medical dispatch function is in the process of being transferred to the responsibility of the two 9-1-1 PSAPs that will be remaining after the current project to consolidate PSAP services are completed.
 - There is some uncertainty about the MCA being allowed to provide oversight of EMD from a medical perspective in the two consolidated PSAPs.

2. RECOMMENDATIONS

- The MCA should position itself to support and augment local ambulance provider quality management efforts rather than replace them.
 - Leverage resources from local hospital, colleges, and industry to provide quality management training and continuing education / professional development for ambulance company and MFR FD quality managers
 - Provide appropriate levels of quality management training for other ambulance company and MFR FD managers
- Provide training modules for front-line staff members at ambulance companies and MFRs on KCEMS’s overall quality management strategy. The modules may be delivered by the training staffs at the ambulance companies and MFRs.
- Develop quality management project templates for use by the ambulance companies and MFR departments. These templates would include:
 - Clinical and operational performance indicator tools
 - Data collection tools
 - Data analysis tools



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- The quality / performance improvement programs throughout KCEMS should place an emphasis on measuring and improving PROCESS performance and de-emphasize individual performance – a more effective strategy for enduring improvement.
 - Individual performance accountability should be maintained, but it should seldom come into consideration unless there are risk management considerations.
- Develop and implement, in an incremental manner, a library of clinical and operational performance indicators for use throughout KCEMS
 - Begin with adaptations from solid existing performance indicator models
 - National EMS Performance Indicator Project
www.nasemsd.org/Projects/PerformanceMeasures/
 - Evidence-Based Performance Measures for EMS Systems
<http://informahealthcare.com/doi/pdfplus/10.1080/10903120801903793>
 - Joint Commission / CMS Core Measures
www.jointcommission.org/PerformanceMeasurement/PerformanceMeasurement/
- Work with local hospitals to develop automated or streamlined processes for obtaining EMS patient outcome data. For example, interfaces or data exports could be built that provide outcome data via the performance management system vendors that local hospitals use for meeting the Joint Commission / CMS Core Measures program requirements.
- Aggregate data provided by the ambulance companies, MFRs, MEDCOM, and receiving hospitals to measure overall system performance on key processes
- To facilitate better case reviews, consider adding fields in patient care reports that will provide a more objective and consistent review process
 - Add a field that explicitly states the ‘field diagnosis’ or equivalent that drove protocol selection
 - Add a field that explicitly states which protocols were utilized
- Based on the field diagnosis stated on the chart, develop a formal process to determine:
 - if the history and physical supported it
 - if the appropriate protocols were used
- Based on what protocols were stated to have been used, develop a formal process to determine:
 - if the protocols were complied with
 - if not, determine if the deviations were appropriate
- Use the case review results to drive improvements a process level rather than at an individual level (with the exception of a significant risk management issue)
- Adopt a formal processes for *process* improvement (e.g., Six Sigma, lean, error-proofing)
- Consider adopting a formal framework for a quality / performance improvement strategy (e.g., Baldrige Criteria for Healthcare Performance Excellence)
- Lead process improvement project teams that encompass the entire EMS system
- Directly address issues in emergency medical dispatch protocols, dispatch QA/QI, and clinical privileges / authorization processes for emergency medical dispatchers. Refer to position papers from NAEMSP regarding medical oversight of dispatch¹ to justify medical

¹ National Association of Emergency Medical Services Physicians: Position Paper: Emergency Medical Dispatching. Prehospital and Disaster Medicine October-December 1989 Vol. 4, No. 2.
<http://www.emergencydispatch.org/articles/positionpaper1.htm>



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

oversight into dispatch processes. The National Academy of Emergency Dispatch can provide a wealth of information to support the justification for medical oversight – regardless if their dispatch protocols or others are used.

- Work with the ambulance companies, MFRs, and receiving hospitals to evaluate the overall EMS system using applicable accreditation criteria, national standards and the Baldrige criteria.
 - Use the findings of these system assessments to engage stakeholder in planning efforts that set strategic and operational priorities and goals

H. CONTINUING MEDICAL EDUCATION

1. FINDINGS

- CME for field staff is delivered by each individual provider organization, presumably in accordance with State and national standards – but otherwise outside the control / influence of the MCA
- No evidence of different levels or types of CME based on level of professional development (e.g. a 15 year veteran paramedic with strong didactic knowledge, practical skills and clinical judgment gets same the STEMI class as a brand new paramedic)
- No evidence of ‘elective’ CME opportunities for intrinsically motivated staff interested in accelerating their clinical / professional growth
- No evidence of coordination of CME efforts between providers
- The clinical ‘rules’ for what EMS students are and are not allowed to do at various points in their training and under what circumstances does not appear to be explicitly addressed in system protocols or policies. This would include preparation and designation of student preceptors. This has significant risk management implications.
- Some field staff members may have low call volume as a root cause for knowledge and skills deficits. There does not appear to be any mechanism to address this issue.

2. RECOMMENDATIONS

- Conceptualize on-going medical education programs in several categories
 - New employee orientation programs for ambulance companies, MFRs and local hospital ED staff members
 - Recertification education – needed for state/national recertification
 - Advanced recertification education – meets requirements for state / national recertification, but tailored towards those interested in professional growth at an advanced level
 - Elective education – Education that goes beyond the minimum requirements for recertification
 - Remedial education – Education that addresses specific educational needs at an individual or small group level
 - Primary education support programs
 - Clinical rotations for students in primary training programs at the MFR, EMT and paramedic levels
 - Elective EMS rotation program for nursing and allied health students



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- EMS rotation program for emergency medicine residents
- The MCA should position itself to support and augment the new employee orientation and recertification education programs of local ambulance services and MFR FDs
 - Provide editorial oversight of recertification education program content
 - Facilitate coordination / sharing of recertification education content and testing procedures between provider organizations, particularly with regard to protocol, equipment and policy changes that impact the entire system
- Provide new employee education program (or content modules to be used by hospitals) for new emergency department staff members
- Leverage resources from local hospitals, colleges and businesses to provide advanced and elective education opportunities
- Facilitate and provide editorial oversight of remedial education efforts by ambulance companies and MFRs
 - For individuals or small groups that remediation to address a specific educational gap (knowledge and/or skills)
- Consider facilitating a program for inter-agency rotations to allow providers in low-volume stations to work on higher volume units. Look for these types of program models in other systems via Michigan MCA group, NAMESP, NEMSMA or other professional networks.
- Develop testing processes to address three different issues:
 - Does the individual meet minimum knowledge and skill levels to obtain 'basic' clinical privileges for their state certification level
 - Does the individual exceed minimum knowledge and skill levels to an extent that they may qualify for higher levels of clinical privileges (a decision that should also consider other factors)
 - As an entirely separate testing process, develop a 'diagnostic' test that determines a person's relative strengths and weaknesses from a didactic standpoint. That information can be used to help formulate a personalized didactic CME 'prescription'
- Develop annual CME objectives based on system educational needs as identified by the QA/QI program and results from the 'diagnostic' testing process.
- For instances where a 'systemic' issue is identified in QA/QI that may have an educational deficit as a root cause, develop a mechanism by which corrective educational action may be taken across the entire system in a fast and efficient manner (e.g., have all of the providers set aside a specific block of time in monthly CME programs for QA/QI driven content)

I. EMS SYSTEMS

1. FINDINGS

- Given all of the healthcare and academic resources in Grand Rapids, the MCA and KCEMS has access to the kinds of people and organizations to build a truly world-class operation – clinically and operationally. There is a strong sense that people know this – which heightens their disappointment that the KCEMS 'system' is so far away from that status.
- This MCA, along with all other MCAs, are designated as entities responsible for forging local 'systems' of prehospital emergency medical care.



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- In a presentation about MCAs made by Robin Shively, Section Manager, State of Michigan EMS & Trauma Systems Section in 2009, her slide said (*emphasis added*) “A Medical Control Authority is an organization designated by the department *for the purpose of supervising and coordinating an emergency medical services system*, as prescribed, adopted, and enforced through department-approved protocols for a particular geographic region.” This language is from the State of Michigan website pertaining to EMS (http://www.michigan.gov/mdch/0,1607,7-132-2946_5093_28508-132260--,00.html).
- Public Health Code Act of 1978, Section 333.2019, paragraph 6 states (*emphasis added*), “Each life support agency and individual licensed under this part is *accountable to the medical control authority in the provision of emergency medical services*, as defined in protocols developed by the medical control authority and approved by the department under this part.”
- A vision document developed by KCEMS states the mission of KCEMS is (*emphasis added*) “to provide for optimal care for the ill or injured patient through continued *development of an emergency medical services system* in the Kent County Medical Control Region which will include plans for the implementation and provision of: a coordinated emergency medical services system” and continues with other bullet points.
- Another planning document from KCEMS states (*emphasis added*), “Kent County Emergency Medical Services is s State-mandated Medical Control Authority that *ensures an excellent system of pre-hospital care* by facilitating collaboration and communication with all health care providers.”
- ‘System’ design has not been explicitly conceived, planned or managed, in the KCEMS service area. This has left many issues unaddressed at a community-wide level that spans the various municipalities and townships and unincorporated areas. Examples include:
 - Response interval performance standards
 - Policies for closest unit response for extremely time sensitive emergencies
 - Process for appropriate allocation of EMS / medical transportation market rights in collaboration with local municipalities
 - Measurement of patient satisfaction with multi-organizational service delivery by emergency medical dispatch centers, ambulances and MFRs
- There appears to be state-wide interest in consolidating the many local MCAs into regional MCAs. Given the role that the Grand Rapids area plays as a regional healthcare resource center, to include tertiary referral facilities and all levels of healthcare education, the KCEMS MCA would be a logical choice for becoming the regional MCA should such changes be catalyzed by the State.
- The MCA does not provide services that aggregate data from multiple providers on the same incident / response so that a ‘system’ view of performance and improvement may be made possible.

2. **RECOMMENDATIONS**

- MCA should fully embrace responsibility for EMS system design as a core component of its responsibilities and value proposition to stakeholders.
- Develop ‘system’ performance standards and mechanisms for improving performance of the entire system over time.



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- Target response intervals and targets for levels of compliance
- Policies and supporting mechanisms for ‘closest unit response’ to extremely time sensitive emergencies (i.e., cardiac arrest)
- Development and implementation of system-wide performance measures
- System-wide quality management efforts that build upon QI data and improvement initiatives within the various EMS provider organizations and hospitals
- Lead system-level strategic planning and implementation support
- Continue with the existing efforts and initiatives for system-level planning and implementation support for larger scale events and incidents, to include disaster response
- Evaluate community needs and work towards developing corresponding legislation, policies, training, quality systems, and processes of care for the large percentage of patients that call 9-1-1 for urgencies and non-emergencies. This may involve integration of services from other entities, such as health departments, social services, referral networks, managed care systems and networks, etc.

III. IMPLEMENTATION PLAN

The following plan sets forth a timeline for when specific objectives might be reasonably expected to be completed. Obviously, such timelines are connected to assumptions regarding funding, getting an effective and appropriately qualified executive director, reconfiguring the staff, and having sufficient ‘political will’ within the EMS and hospital community to move in the general direction described in these recommendations.

The scope of the items in the timeline is intentionally broad - and intentionally ambitious. The KCEMS MCA needs to act boldly to help overcome the situation is now finds itself in.

- Continuation of Existing Services
 - Hospital notification services (MEDCOM)
 - System credentialing of field providers
 - Drug bag program
 - EMS compliant management
 - Professional Standards Review Organization activities
 - Protocol testing for initial credentialing
 - Medical Reserve Corps program support
 - AED program services for non-EMS entities
 - Run report form services
 - Special project management (e.g., CPAP program development)
 - Medical Director meetings with ambulance service managers (until the roundtable sessions begin within 3 months)
- Within 1 month of final report delivery, the KCEMS MCA Board needs to:
 - Review / confirm / modify the proposed mission, vision and strategic plan outline
 - Decide between:
 - Immediately seeking a new executive director while keeping the MCA in a holding pattern during a search and hiring process
 - Promptly engage a firm or individual on an interim basis to execute on a ‘turn-around’ strategy to get the MCA well into the implementation plan while



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

looking for a permanent executive director in the background (perhaps with an option to negotiate a permanent executive director contract after the interim's performance has been evaluated during the 'turnaround' period)

- The individual or firm should begin service ASAP - ideally before the end of November
- Within 1 month (of Executive Director [or interim] start date)
 - Approve a budget based on the adopted mission, vision and strategic plan to the Board for review, adjustment and approval
 - Make adjustments to responsibilities of the incumbent staff
 - Incumbent QI Coordinator – Work with incumbent to make the transition in their scope of responsibilities and hours away from QI with the remaining time under a 0.5 FTE re-focused on the service inquiries, education coordination, certification processes, and assigned projects
 - Medical Director and Deputy Medical Director – consider potential adjustments in work hours between them, while fitting within the total allocation of 20 physician hours; Focus their time on specific strategic and operational priorities.
 - Bring in new staff
 - Office / Project Coordinator
 - '10-99' contractors for QI, IT, etc.
 - Create a project team that includes ranking hospital executives and their chief quality officers (or equivalent) to design a formal process for clinical outcome data collection / sharing between the MCA and hospital QI programs
 - Resolve questions regarding the role that the MCA should play in the emergency medical dispatch process for the two newly consolidated 9-1-1 PSAPs
- Within 3 months
 - Working directly with KCEMS MCA Board of Directors, conduct a 'Getting Started' self-assessment of the MCA using the online tools at <http://www.nist.gov/baldrige/enter/self.cfm>
 - Complete development of a clinical outcomes database
 - Begin the clinical outcome data collection process
 - Begin the Medical Director 'town hall meetings' with ambulance service and MFR field personnel
 - Begin the Medical Director 'roundtable sessions' with ambulance service and MFR managers
 - Launch MCA to EMS provider communications services
 - Redesign the KCEMS website to include:
 - Electronic newsletter on MCA and KCEMS activities, performance, and educational content
 - Social media components
 - MCA Twitter handle and hash tag for KCEMS
 - Facebook page for KCEMS
 - Podcasts (audio) and v-casts (video), Twitter feeds, and Facebook entries derived from electronic newsletter content, MCA and 'system' announcements, event dates, performance / activity stats
 - Provide editorial oversight on remediation plans for individuals or small groups
 - Create a project team to develop and implement system-level performance measures



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- Include 9-1-1 PSAP, ambulance, fire, hospital, and public health representatives
 - Launch at least one clinical performance improvement project
 - Decide what course of action to take with regard to MEDCOM (reduce / eliminate -or- expand / enhance)
- Within 6 months
 - Begin to report system activity statistics based on aggregated data from all levels of providers and citizen interventions
 - Reinstitute practical skills labs
 - Expand/enhance the initial certification testing process to determine:
 - Does the individual meet minimum knowledge and skill levels to obtain 'basic' clinical privileges for their state certification level
 - Does the individual exceed minimum knowledge and skill levels to an extent that they may qualify for higher levels of clinical privileges (a decision that should also consider other factors)
 - Provide editorial oversight of recertification education program content
 - Support and augment the new employee orientation and recertification education programs of local ambulance services and MFR FDs
 - Submit the results of at least one clinical performance improvement project to be considered for publication and/or presentation at a national level
 - Begin at least one more performance improvement project (minimum total of 2, including the first one started in the first three months)
 - Delineate MCA services that can be provided remotely by the KCEMS MCA to other MCAs
- Within 1 yr
 - Facilitate and/or directly provide performance management training to the ambulance services and MFRs
 - Develop and implement performance indicators specifically for the MCA
 - Develop quality management project templates for use by the ambulance companies and MFR departments. These templates would include:
 - Clinical and operational performance indicator tools
 - Data collection tools
 - Data analysis tools
 - Conduct a baseline assessment of the MCA using the Baldrige criteria (Michigan version)
 - Develop a set of performance indicators for KCEMS – as a system – that align with the challenges in the EMS Agenda for the Future and the IOM's EMS at the Crossroads reports.
 - Submit State protocol waiver applications
 - Derived from QI and research project initiatives
 - Derived from enhancements / improvements that can be made on the State format
 - Develop process to facilitate coordination / sharing of recertification education content and testing procedures between provider organizations, particularly with regard to protocol, equipment and policy changes that impact the entire system
 - For instances where a 'systemic' issue is identified in QA/QI that may have an educational deficit as a root cause, develop a mechanism by which corrective educational action may be taken across the entire system in a fast and efficient



FINDINGS AND RECOMMENDATIONS TO THE KENT COUNTY EMS MEDICAL CONTROL AUTHORITY

- manner (e.g., have all of the providers set aside a specific block of time in monthly CME programs for QA/QI driven content)
- Create a project team to undertake a EMS system design project that address the challenges in the EMS Agenda for the Future and the IOM EMS at the Crossroads reports
 - Launch an EMS orientation program for ED staff
 - Launch an online medical control training program for ED physicians
 - Launch a QI process for online medical control
 - Redesign the EMS rotation program for EM residents that should include:
 - Capability to accept EM residents from any program in the US or Canada
 - Listing of discrete short time frame research projects suited to be completed by EM residents, with MCA staff supervision, during their EMS rotation
 - Deliver the first annual report on the MCA and the status of the overall KCEMS system
 - Have a plan ready for implementation that offers services from the KCEMS MCA to other MCAs
 - Have a plan ready to implement for re-branding of the KCEMS MCA
 - Within 2 yrs
 - Develop a ‘diagnostic’ didactic testing program to drive QI and education priorities
 - Develop annual CME objectives based on system educational needs as identified by the QA/QI program and results from the ‘diagnostic’ testing process.
 - Leverage resources from local hospitals, colleges and businesses to provide advanced recertification and elective education opportunities
 - Provide support to primary EMS and related education programs
 - Clinical rotations for students in primary training programs at the MFR, EMT and paramedic levels
 - Delineate protocols for what students are and are not allowed to do and under what circumstances
 - Provide an elective EMS rotation program for nursing and allied health students
 - Create a project team to address target response intervals and targets for levels of compliance for the entire system
 - Create project team to address policies and supporting mechanisms for ‘closest unit response’ to extremely time sensitive emergencies (i.e., cardiac arrest)
 - Have at cumulative total of at 4 least performance improvement projects underway or completed
 - Deliver the 2nd annual report on the MCA and the status of the overall KCEMS system
 - Begin offering services to other MCAs
 - Within 3 yrs
 - Design and facilitate a program for inter-agency rotations to allow providers in low-volume stations to work on higher volume units. Look for these types of program models in other systems via Michigan MCA group, NAMESP, NEMSMA or other professional networks.
 - Evaluate community needs and work towards developing corresponding legislation, policies, training, quality systems, and processes of care for the large percentage of



**FINDINGS AND RECOMMENDATIONS TO THE
KENT COUNTY EMS MEDICAL CONTROL AUTHORITY**

patients that call 9-1-1 for urgencies and non-emergencies. This may involve integration of services from other entities, such as health departments, social services, referral networks, managed care systems and networks, etc.

- Have at cumulative total of at 8 least performance improvement projects underway or completed
- Deliver the 3rd annual report on the MCA and the status of the overall KCEMS system
- Within 5 yrs
 - Have at cumulative total of at 16 least performance improvement projects underway or completed
 - Have at least 50% of the other MCAs in this region using services provided by the KCEMS MCA -or- be the consolidated MCA for this region