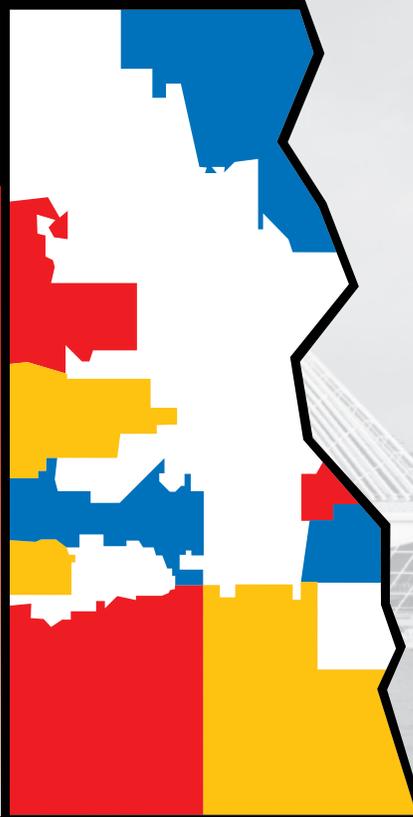


**MILWAUKEE  
COUNTY**



**EMERGENCY  
MEDICAL SERVICES**



Nationally Recognized, Locally Respected.

ANNUAL REPORT  
**2011-12**





## OVERVIEW

The Milwaukee County Emergency Medical Services (MC EMS) system is a countywide system. County tax levy and local municipal funds support the EMS system. Milwaukee County covers 241 square miles and serving approximately 952,532 people. It includes 19 separate municipalities that each provide their own BLS services (private and/or fire service). The MC EMS consists of 15 dedicated ALS units and 22 flexible ALS/ BLS fire service ambulances. The MC EMS system has grown to 378 municipal fire department paramedics who evaluated 36, 614 patients in 2011 and 40, 040 patients in 2012.; Thirty-seven active fire department rescue squads (BLS) and 56 engine companies function as first responder units in Milwaukee County.

Initial access to the system occurs via several enhanced 911 call-taking centers where dispatchers are able to see the phone number and address of the location from where the call is placed. For 911 calls from cellular phones, Milwaukee County Sheriff's Department dispatchers route the call to the dispatch center of the municipality where the caller is located. The appropriate EMS

units are dispatched in a tiered response according to protocol. An automatic defibrillator-equipped Basic Life Support unit (either a fire department rescue squad, fire truck, or private BLS ambulance) is sent as a first responder on every call and responds on average in 4 minutes. When necessary, a MED Unit will request a physician in EMS Medical communications center for assistance and additional orders.

The physician medical directors of the Milwaukee County EMS system provide medical 24/7 oversight for all Milwaukee County EMS system plan participants. This includes developing policy and procedure for all aspects of out-of-hospital care including appropriate dispatch, communications, medical treatment and destination.

This document will serve as the annual report and will include initiatives for both calendar years 2011 and 2012

**Mission Statement:** *The mission of Milwaukee County EMS is to provide performance excellence in pre-hospital care through education, communications, operations, health information and quality management, and scientific discovery.*



Nationally Recognized, Locally Respected.

## ADMINISTRATION

The administration of MC EMS manages the coordination of the day-to-day operations and strategic planning for the short term and long term future. Managers in the education, health information, quality assurance, communications and equipment/supply sections of MC EMS report to and collaborate with the program director to meet the mission and visions of the division.

### Working With Partners

One of the goals for MC EMS administration was to increase collaboration through two-way accountability through information exchange—defining roles and responsibilities and developing common goals. This was managed through a couple of initiatives in 2011 and 2012. EMS Administration worked to strengthen partnerships with other county departments including Behavioral Health to educate EMS providers on mental health issues and Information Management Services Division to assist EMS in launching video conferencing education to municipal EMS stations. The Village of Greendale Fire Department graduated their first two classes of paramedics and transitioned to providing 24/7 paramedic coverage to their community. The Village of Hales Corners Fire Department enrolled 21 students in the EMT/Intermediate Technician (IV Tech) and increased the level of services provided to local residents. The EMS Education Center took steps to strengthen the partnerships with area fire departments by developing a process where the fire department staff collaborate with faculty from the EMS Education Center to vet newly hired paramedics during their orientation process into the MC EMS system.

### Green Initiatives

EMS has taken a number of steps to decrease our carbon footprint and decrease use of paper. MC EMS system Standards of Care manual is only available electronically, decreasing the need to print thousands of pages of medical and system policies as well as practical skill instructions. Staff of EMS also attends state EMS office meetings via video conferencing. The EMS division also began holding meetings and EMS classes via video conferencing, decreasing the need for partners and students to travel to the offices for meetings and classes.

### Integration of Scientific Discovery & Practice

The Milwaukee County EMS system continues to follow our mission of using evidence based practices identified through scientific discovery (research) to help sculpt our medical policies and Standards of Care. Through our partnerships with the Medical College of Wisconsin and international research collaborative organizations such as the Resuscitation Outcome Consortium (ROC), the Neurological Emergency Treat Trials (NETT) and other pediatric research consortiums, we have been able to stay on the cutting edge of medical practices that have been proven to be effective and eliminate older practices that have been proven to not be as effective as once thought. Integration of current evidence based practices does not come easy. Many EMS stakeholders, agencies and providers within the Milwaukee County EMS system work very hard to conduct this research all in the name of medical progress and improvement of services offered.

### Staffing Changes

A constant goal for MC EMS was to ensure that proper staffing levels were present within the division in order to provide a high-quality EMS system. An hourly EMS instructor with EMS and nursing background was hired to further augment full-time faculty and support the Education Department by the utilization of flexible hourly staff. After twenty years as medical director, Dr. Ronald G. Pirralo stepped down from his position as a medical director for the MC EMS system. His leadership has been invaluable to in moving the EMS system ahead and providing high quality out-of-hospital care. As of January 1, 2013, MC EMS welcomes Dr. M. Riccardo Colella as the third medical director in the 39 year history of the EMS system.



## Technology Changes

MC EMS has a goal to use technologies to improve our services. MC EMS implemented an Internet-based database where we would be able to track staffing of the nine municipal fire department paramedic 37 units on a daily basis as well as federally-controlled medications and daily defibrillator system checks. This process significantly improves our efficiencies. MC EMS worked with computer programmers to develop an Internet based medical supply ordering system and will deploy the system in early 2013. Wireless access was created in the EMS classroom and conference room, making access to the Internet for educational and system planning easier.

## Keeping Pace With National Trends

MC EMS has taken a number of steps to keep pace with national trends. The EMS Education Center has revised their curriculums to meet state and national scope of practice changes outlined in the national EMS Educational Agenda for the Future. In addition, the EMS Education Center submitted an Initial Self Study Report to Committee on Accreditation of Educational Programs for the Emergency Medical Services Professions (CoAEMSP) to become an accredited paramedic education institution. The National Registry of EMTs, which is the national certification organization the state of Wisconsin uses to administer the state paramedic licensing exam has required candidates sitting for the paramedic exam to have graduated from an CoAEMSP accredited EMS school after 2013. MC EMS Education Center hopes to have our accreditation site visit in early 2013.

## Participation in State and National Collaborations

**EMS Education Center** continued to work with area EMS Education institutions to collaborate on curriculum development, student clinical experiences and patient simulation experiences.

**Quality Improvement** section collaborated with local health care systems to improve the quality of care provided to trauma, stroke and cardiac patients. Quality Improvement manager continues to work with the Wisconsin Center for Performance Excellence and gain valuable experiences creating quality initiatives.

**Health Information Management (HIM)** continued to work with area fire departments and their electronic patient care record vendors to refine the electronic databases. In addition, HIM continues to work with area health care systems to provide follow up feedback on patients transported by municipal fire department.

**Medical Communications Center** worked with local and state Department of Transportation agencies to develop mitigation travel and communication plans for EMS vehicles to travel to the Milwaukee Regional Medical Center grounds during the upcoming Zoo Interchange redesign.

**EMS Administration** along with the quality improvement section began collaborations with the American Heart Association in a Mission Life Line initiative aimed at improving the care provided to patients having heart attacks.

# QUALITY IMPROVEMENT



## Raising the Community Standard of Care

The Community Standard of Care was rewritten to incorporate a new level of EMS provider within Milwaukee County. The Hales Corners Fire Department upgraded provider licensure from EMT-Basic to EMT-Intermediate Technician. Intermediate Technicians are able to initiate IV, administer IV solutions and basic emergency medications prior to arrival of a neighboring paramedic unit. In cases where the patient does not require further treatment or monitoring, Hales Corners EMS is capable of transporting the patient to the appropriate emergency department for definitive care.

## Local Health Care System Partnerships

Milwaukee County EMS partners with all local health care systems to improve patient outcomes. Membership on Cardiac, Stroke, and

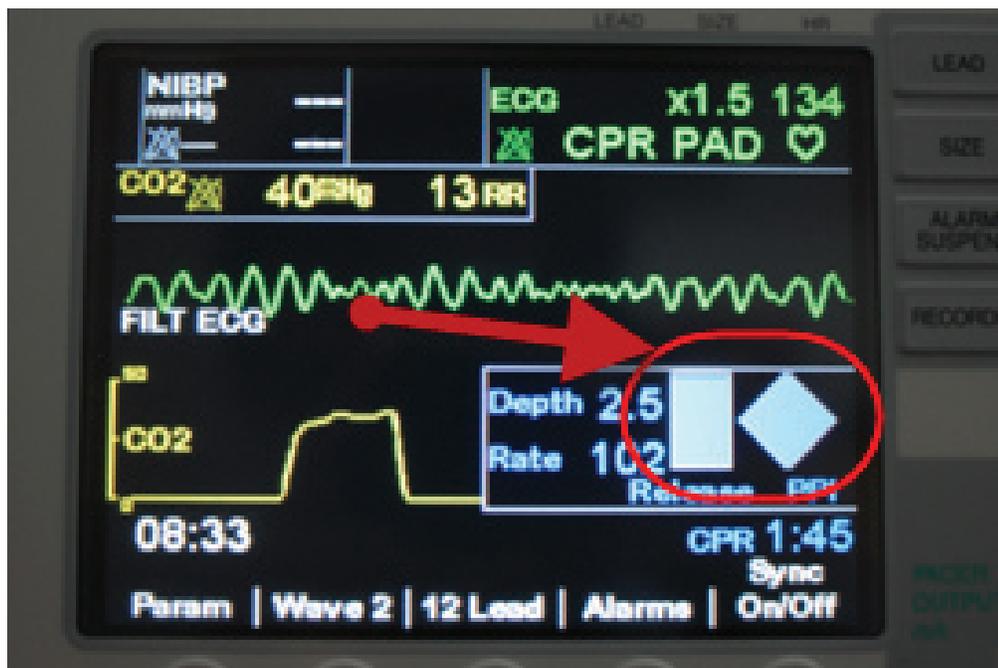
Trauma Committees maximizes the collaborative efforts of providers at all levels to ensure a patient receives consistent, standardized treatment and transport to an appropriate facility capable of providing the ongoing care needed. This optimizes the patient's chances of returning to the lifestyle prior to their potentially life-changing event.

## Improving Cardiac Arrest Outcomes

The Medical Director, Program Director and Quality Manager attended the Resuscitation Academy, a mini-fellowship program conducted by Seattle Medic One and King County EMS for EMS managers, EMS directors and EMS medical directors who want to improve survival rates in their own community. Academy participants learned how to:

- Define the cardiac arrest survival rate in the host community
- Understand the principles of uniform data reporting
- Develop a concrete plan of action to improve survival
- Measure the effect of the plan of action on cardiac arrest survival

The ECG monitor software was upgraded in 2012 to provide real-time monitoring and feedback on the quality of CPR provided. Screen indicators show when CPR chest compressions are provided at the appropriate rate and at the appropriate depth. This allows providers to make adjustments immediately as necessary.



# QUALITY IMPROVEMENT

## Improving Heart Attack Outcomes

The Medical Director, Program Director and Quality Manager attended the Mission: Lifeline Wisconsin Regional Task Force Meeting sponsored by the American Heart Association. The purpose of the meeting was to:

- Enhance healthcare professionals' knowledge and understanding of the diagnosis, treatment and management of cardiovascular emergencies within regional systems of care.
- Enhance the regional integrated system for reestablishing cardiac circulation, including EMS, emergency medicine and cardiology in medical centers capable (or not) of providing invasive cardiac procedures
- Employ optimal systems and strategies for diagnosis and management of STEMI (a specific type of heart attack), including destination and transfer protocols based on clinical trials evidence, practice guidelines, and quality of care standards

Not all patients having a heart attack present with the classic symptom of chest pain. Women especially present with less typical symptoms of weakness, fainting, difficulty breathing, etc. The system standard of care has been expanded to acquire 12-lead ECGs on these patients to rule out a possible cardiac event. The number of STEMI heart attacks identified since this change in standard has increased.

**Pre-hospital 12-leads Diagnostic of STEMI by Year**



A very important component of activating cardiac teams is the ability to transmit a copy of the patient's ECG to the receiving hospital. When the ECG is available to emergency and cardiac physicians prior to the patient's arrival, the patient can bypass the emergency department, going directly to the cardiac cath lab for definitive treatment. A new transmission process was implemented late in 2012. Early results indicate successful ECG transmission rates have improved significantly. Time is muscle!

**12-lead Transmission Success Rate**



## Improving Stroke Outcomes

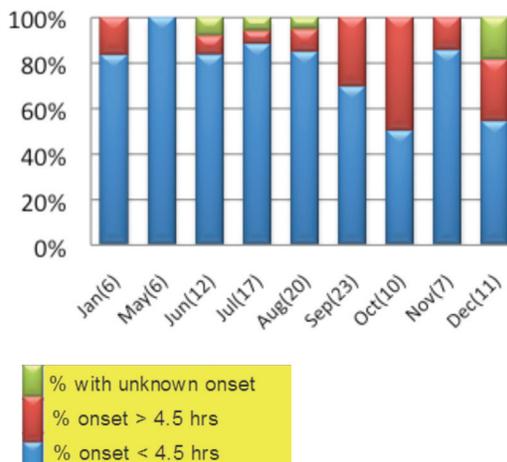
Milwaukee County EMS initiatives to support improved outcomes include continued collaboration with local receiving hospitals to improve alerts for stroke patients, as well as cardiac arrest, heart attack and major injuries.

Stroke treatment has made great advances. When detected early, a stroke can be stopped, often with good recovery outcomes for the patient. Establishment of symptom onset and patient assessment using a uniform diagnostic tool is standard of care by responders at all levels. When results are positive for stroke, the hospital is notified and the in-house stroke teams are activated according to the facilities' protocols.

As with cardiac arrest, major injury, or a heart attack, time to treatment is an important factor in stroke recovery.

**2012 ALS Stroke Transports (Sample Audit)**

**Patient Reported Symptom Onset**



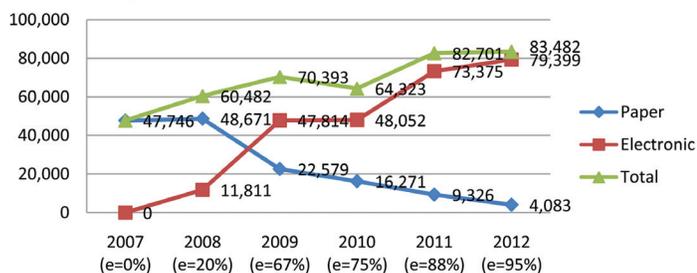
# HEALTH INFORMATION MANAGEMENT

The Health Information Management section of Milwaukee County EMS is responsible for the collection, computerization and management of all patient care information generated by our contracted municipal EMS providers in the Milwaukee County EMS system. The section also ensures compliance with state confidentiality laws and the federal Privacy and Security Rules (HIPAA) governing protected health information.

## Data Collection Process

In 2012, a real-time paperless data entry model was achieved by all transporting municipal EMS providers in the collection of patient care information from the field (at the patient's side). The system-wide transition from a custom designed paper-based patient care record to an electronic patient care record (ePCR) occurred over a 5 year time period.

### Patient Care Record Collection Paper vs Electronic - Conversion Rate



Each municipal EMS provider uses a contracted vendor software product that meets all National, State and Local EMS uniform data collection requirements as well as customizations to meet our system's operational needs. There are two types of software products being used, TripTix and ImageTrend. The ePCRs are uploaded via wireless Internet to the vendor's database upon record completion and then pushed out to the receiving hospital either by faxing or posting to a website dashboard for viewing and/or downloading. The vendor also exports the patient care data to both the Milwaukee County EMS patient care record database and the Wisconsin Ambulance Run Data System (WARDS).

## Patient Care Record Database

Milwaukee County EMS has an Oracle web-based relational database that was custom designed to accommodate the increasing data elements, system connectivity needs, and reporting obligations. The database supports our system's tiered response model with multiple responding units providing individually defined patient care documentation into one PCR. Both the BLS and ALS level care provided are documented in the same patient care record. Its web-based technology supports remote site access to the database via the Internet by all authorized EMS system participants. This provides opportunities to generate reports, run database queries and access the older paper record images for viewing or printing.

## Patient Care Record Components

1. **Patient Care report** – Complete record of care provided by the EMS Providers
2. **EMS Medical Command report** - EMS calls requesting medical direction are connected to physicians through our EMS Communications Center. The medical control physician documents all orders on a Medical Command form which is then linked to the EMS patient care record in the database.
3. **Electrocardiograph** – ECG wave form file captured from the ZOLL heart monitor and linked to the patient care report.

## HIM Section Newer Initiatives

In addition to the rigorous data integrity checks the HIM staff perform on a regular basis to help ensure data accuracy, the following newer processes were conducted in the HIM section:

- Data mining to identify and abstract data from patient care records with the provider's primary impression of STEMI (ST elevation myocardio-infarction). The data is provided to our Quality Manager for further patient follow-up from the receiving hospital. This outcome process is defined in the Quality section of this annual report.
- ECG transmission monitoring to ensure all EMS Provider ECG files are being uploaded and received at Milwaukee County EMS. Any missing ECG files are investigated and resolved.

## HIM Accomplishments:

- Three additional municipal EMS Providers completed the transition from paper to electronic PCRs in the collection of patient care information from the field (at the patient's side). All transporting EMS Providers now use ePCRs.
- Eliminated all patient care record data entry backlogs due to the reduction of paper records used by EMS Providers.
- Developed and posted several educational tutorials on electronic PCR documentation improvement practices for all EMS Providers on the distributive learning website.
- The Oracle database software was upgraded to 11G which supports the encryption of protected health information in compliance with the technical safeguards in the HIPAA security standards.

## System Information

**Population: 952,532 (2011 census)**

**Land Area: 241.40 square miles**

**Persons per square mile: 3,926**

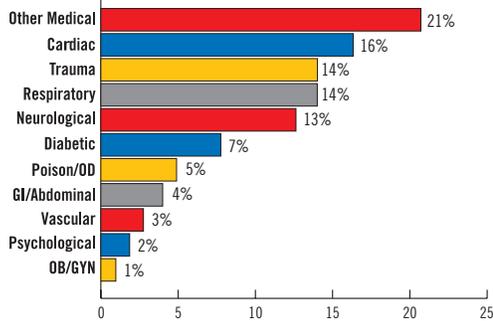
- **Population under 5 years – 7.4%**
- **Population under 18 years – 24.9%**
- **Population over 64 years – 11.4%**
- **Population over 18 and under 64 – 63.7%**

# HEALTH INFORMATION MANAGEMENT

## Statistics – Advanced Life Support (ALS) Units

Number of ALS (Paramedic) units = 37

	2012	% Change
• Notifications of Dispatch: (EMS Communications Center)	54,478	(+4.6%)
• Total Doctor Calls:	1,325	(+7.3%)
• Total ALS Patients Seen	39,788	+17.8%
• Total ALS Transports	25,181	+11.2%



### ALS Patient Demographics

- 90% Response Times are <= 9 min.
- Average Response Time = 4.7 min.
- Average Pt. Scene Duration\* = 20.2 min.
- Average Transport Time = 12.5 min.

\* At scene duties consist of assessing and stabilizing patient before transport to the hospital to prevent further injury.

### ALS Patient Demographics

- Male 48 %
- Female 52 %

### ETHNIC ORIGIN

- White 46 %
- African American 21 %
- Hispanic 2 %
- Asian 0.5 %
- Native American 0.2 %
- Unknown 30 %

### AGES

- <= 2 2 %
- 3-7 1 %
- 8-21 7 %
- 22-40 18 %
- 41-59 29 %
- 60-80 26 %
- > 80 17 %

## Milwaukee County Mitchell International Airport Fire Department Basic Life Support (BLS) Services

Total Patients Seen in 2012 = 427

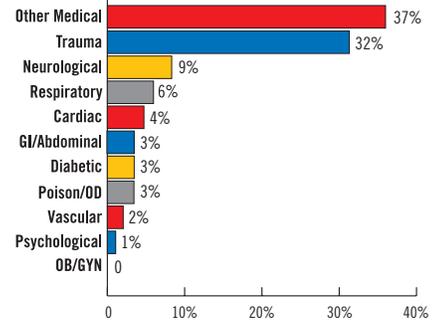
### Airport Fire Department Patient Conditions (See graph)

Cardiac Arrest Occurrences = 2  
Outcome: 2 expirations

### Patient Dispositions

Transported to hospital by:

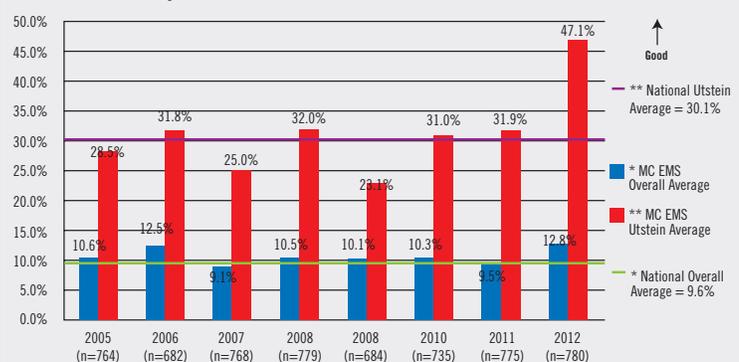
- ALS (Fire Department) = 43
- BLS (Private Ambulance) = 73
- Refused Transport = 297



### 2012 MS Transports by Receiving Hospital

ALL SAINTS ST MARY'S - RACINE	28
AURORA GRAFTON MEDICAL CTR	169
AURORA SINAI MEDICAL CENTER	1464
AURORA WOMEN'S PAVILION	3
CHILDREN'S HOSPITAL OF WI	1139
COLUMBIA ST MARY'S-MILWAUKEE	2567
COLUMBIA ST MARY'S-OZAUKEE	661
COMMUNITY MEMORIAL HOSPITAL	346
ELMBROOK MEM. HOSPITAL	90
FROEDTERT HOSPITAL	5576
MEDICAL EXAMINER	61
ST FRANCIS HOSPITAL	1352
ST JOSEPH REGIONAL MED. CENTER	3616
ST LUKE'S FRANKLIN HC CENTER	3
ST LUKE'S MEDICAL CENTER	4140
ST LUKE'S SOUTH SHORE	836
THE WISCONSIN HEART HOSPITAL	724
VA VETERANS HOSPITAL	194
WAUKESHA MEMORIAL HOSPITAL	18
WEST ALLIS MEM. HOSPITAL	1599
WHEATON FRANCISCAN HC-FRANKLIN	550
<b>TOTAL</b>	<b>25,136</b>

### Out of Hospital Adult Cardiac Arrest Survival Rates



\* All arrest ECG rhythm types, witnessed and unwitnessed arrests of cardiac origin. (National Average from CARES Registry surveillance report 2005-2010).  
\*\* Arrest ECG rhythm = ventricular fibrillation/VT, of cardiac origin, witnessed to collapse by a bystander. (National Utstein Average also from CARES Registry).  
n = Number of cardiac arrests per year of cardiac origin with attempted resuscitation by paramedics.

Potential explanations for jump in survival rates in 2012:

- Changes in American Heart Association CPR guidelines
- Improved quality of CPR
- Hospital based therapeutic hypothermia

# EMS EDUCATION

## Web Based Education

MC EMS Education Center Continued our distribution of education via an Internet web based method. The method that we have been using is called Distributive Learning (DL), we also expanded on this method to using a live video conferencing system to deliver lectures. This method allows us to be in one location and reach many other locations. MC EMS currently broadcasts our continuing education modules from our facility at MC EMS into all of the municipality fire houses.

## Initial Paramedic Class of 2012

In May of 2012 22 students from Franklin, North Shore, South Milwaukee, West Allis, and Milwaukee Fire Departments completed the paramedic program at MC EMS. 21 students were firefighters from the municipalities and 1 student was a MC EMS faculty that was incorporated into the class through an RN – Paramedic.

In 2012 MC EMS started two more initial paramedic classes – one class started in Aug of 2012 and will be attending the paramedic class at MC EMS on duty and is expected to finish 9/28/2013. The second class started in October of 2013 and this class will also be attending the paramedic class at MC EMS but they will be on a 40 hour week and is expected to finish 6/12/2013. These will be our 54th and 55th paramedic classes since the beginning of the program.

## MC EMS students continue to have an above average pass rate on the National Registry Exam

MC EMS currently has clinical affiliations with 8 sites and currently goes to 17 different sites for clinical rotations. The sites we are currently utilizing are Froedtert – cath lab, ED, OR and RESP dept; Aurora St. Luke's – cath lab, ED, and OR; Aurora Sinai ED; Aurora St Luke's South Shore; Columbia St. Mary's – ED and OR; Wheaton Franciscan St. Joes Hospital – OB; Children's Hospital of Wisconsin – ED and OR; Milwaukee County – psych crisis and medical examiner. MC EMS partners with Medical College of Wisconsin in order to attend preceptor ships and utilize their Star Center which is a High Fidelity Human Patient Simulation Lab.

At the end of the Didactic and clinical portion of the paramedic program MC EMS students go to the fire departments to finish off their education with field training.

## Continuing Education for Milwaukee County Paramedics

MC EMS provides 72 hours of continuing education hours for all Milwaukee County Paramedics in order for the paramedics to maintain their state and National Registry licenses.

In 2012 MC EMS in collaboration with the municipality fire departments completed all continuing education requirements for all EMT – Basics within our system.

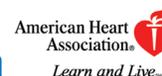
In 2012 MC EMS changed the delivery model for continuing education to incorporate the web based education. MC EMS also

is providing ACLS and PALS training in the fire houses for MC EMS paramedics.

## Transfer Paramedics

MC EMS and the fire departments have revised the transfer paramedic process, when a fire department hires a new employee that already is a paramedic they go through a MC EMS transfer paramedic process. This process incorporates using Fire house personnel to act as preceptors to the transfer paramedic and allows each department to have more flexibility in their orientation process.

## American Heart Association



MC EMS is a certified training center for the American Heart Association. MC EMS provides AHA classes at all levels for fire departments, county departments and community classes. MC EMS is certified to provide classes in Heart Saver CPR, Healthcare provider CPR, Advanced Cardiac Life Support (ACLS), Pediatric Advanced Life Support (PALS) and First Aid. MC EMS always is the training center for 19 other AHA sites.

In 2011 Milwaukee County EMS provided 93 AHA courses which educated a total of 819 people.

- 35 CPR classes, 5 ACLS classes, 23 PALS Classes

The training sites under Milwaukee County EMS as an AHA training center taught 185 classes which educated at total of 1198 people.

- 173 CPR classes, 6 ACLS classes, 6 PALS classes

In 2012 Milwaukee County EMS provided 76 AHA courses which educated a total of 474 people.

- 26 CPR classes, 48 ACLS classes, 2 PALS classes

The training sites under Milwaukee County EMS as an AHA training center taught 278 classes which educated a total of 2262 people.

- 258 CPR classes, 15 ACLS classes, 5 PALS classes

## EMT BASIC REFRESHER

In 2012 MC EMS, in collaboration with the municipality fire departments, completed all continuing education requirements for all EMT- Basics within our system.

EMT Basic refreshers require 48 hours of education – 42 hours are provided in house through fire department personnel, the last 6 hours and the testing portion is provided by MC EMS.

## State EMS Instructor II

All Full time Faculty for MC EMS attended the State EMS instructor II workshop and are now state licensed at the Instructor II level for EMS education.

## Intermediate Technician Course

In 2011 MC EMS trained 22 students from Hales Corners to raise their provider level from EMT Basic to an Intermediate level. This allows Hales Corners Fire department to provide a higher level of service and care for their community.

# EMS COMMUNICATION CENTER

## Hospital Paging System

In 2011 and 2012, Milwaukee County EMS Communications Center (EMS Com) continued to roll out its automated paging notification system to area hospitals. By the end of 2012, the EMS Communications Center was alerting 9 of the County's 11 emergency departments of incoming patients via its Oracle-based paging system. In the paging process, data gathered by the EMS communicators from transporting EMS providers is automatically forwarded in a digital page to health care teams at the receiving hospital, allowing for the uniform distribution of data to multiple health care providers prior to patient arrival. Trauma, cardiac catheterization and stroke management teams, along with emergency department staff, are all able to get the same information in a timely manner, eliminating multiple phone calls.

## Interoperable Communications

EMS Com is committed to sustaining and enhancing interoperable communications throughout the County, the South East Region, and greater State of Wisconsin. EMS Com leadership represents and advocates for the EMS community on the Milwaukee County Radio Advisory Council and the South Eastern Wisconsin Regional Interoperability Council which strives to ensure effective and coordinated radio and data communications between different municipalities and disciplines. Interoperable radio communications are essential for the management of mass casualty or large scale incidents when agencies from different municipalities must respond and work together. In an effort to enhance the interoperable capabilities of the paramedic rescue squads in Milwaukee County, MC-EMS has issued upgraded 'Dual Band' radios which are capable of communicating on both VHF and 800 Mhz frequency bands, doubling the number of radio systems they are able to communicate with. These radios were also configured on the Wisconsin Interoperable System for Communications (WISCOM) state wide trunking network, enabling the user to speak with any agency within the state.

## Zoo Interchange Project

In coordination with the members of the Milwaukee Regional Medical Center (MRMC) and the Wisconsin DOT, EMS Com is preparing to meet the operational challenges created by the Zoo Interchange Construction project scheduled to take place from 2013 through 2018 on the door step of our region's (two) Level 1 Trauma Center(s). Ensuring that ambulances transporting to the MRMC are able to quickly navigate through changing detours and traffic congestion is our top priority. In close collaboration between MRMC, WI-DOT, and the State Traffic Operations Center, EMS Com will provide real time traffic and construction information to ambulances, assisting them in finding the quickest and safest route to the hospital.

## 12-Lead ECG Transmission

A STEMI is a particular type of heart attack requiring prompt administration of specialized treatment. The key to effective treatment of STEMI patients is rapid diagnosis and transportation to a hospital with a catheterization team. Rapid diagnosis is dependent upon the EMS providers' ability to acquire and transmit a 12-Lead ECG, which is kind of like a picture of the heart, to the hospital where it can be reviewed by a physician. Once the 12-Lead arrives in the physician's hands, the hospital's cath team can be activated, ready and waiting to treat the patient upon arrival at the hospital. The process often hinges on the successful transmission of the 12-Lead. At the end of 2012, EMS Com upgraded its analog 12-Lead transmission infrastructure to a digital, cloud based system call RescueNet 12-Lead. The new system is more cost effective and has greatly increased our system's successful 12-Lead transmission rates. The increase in transmission rates translates into better outcomes for our patients.

## Statistics

<b>EMS Communications Center Activity</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Total Communication Events	67,508	71,694	72,908
Requested for Communication Frequency	49,448	54,217	57,632
Requests to Speak to a Medical Control Physician	1,443	1,325	1,368
<b>Froedtert Memorial Lutheran Hospital</b>			
Ambulance Triage Pages	13,025	13,771	13,870
Trauma Team Activation	3,140	3,331	3,390
Total Froedtert Pages	16,165	17,102	17,260
<b>Children's Hospital of Wisconsin</b>			
Ambulance Triage Pages	5,169	5,669	5,653
CHW Trauma Pages	397	438	450
Total CHW Pages	5,566	6,107	6,103

# OPERATIONS

## Bradley Center Activities

The BMO Harris Bradley Center continues to contract with Milwaukee County EMS to provide advanced level emergency medical care to the spectators and BMO Harris Bradley Center staff who attended one of the numerous Admirals hockey games, music concerts, motorcycle events, college graduations, corporate meetings, and gymnastic events. Over 1.6 million spectators attended events in 2012 at the Bradley Center.

### 2012 BMO Harris Bradley MC EMS Activity:

#### Patient Care Calls Received

Medical Assessments	97
Trauma Assessments	72
<b>Total</b>	<b>169</b>

#### EMS Transports

ALS Level Care Transports	18
BLS Level Care Transports	11
<b>Total</b>	<b>29</b>

#### Non-Transports

ALS Treatment-Patient Refused Transport	14
BLS Treatment-Patient Refused Transport	126
<b>Total</b>	<b>140</b>

#### BMO Harris Bradley Center EMS Transports by Receiving Hospital

Aurora Sinai Medical Center	13
Columbia St. Mary's-Milwaukee	7
Froedtert Hospital	3
St. Francis Hospital	1
St. Joseph Regional Med. Center	2
St. Luke's Medical Center	2
<b>TOTAL</b>	<b>28</b>



### MONTHLY SUMMARY

Month	Patient Calls	Medical	Trauma	Non-Transports	EMS Transports
January	14	9	5	10	4
February	21	12	9	19	2
March	31	20	11	27	4
April	16	9	7	16	0
May	10	4	6	10	0
June	0	0	0	0	0
July	14	9	5	11	3
August	2	1	1	2	0
September	4	1	3	3	1
October	18	12	6	15	3
November	16	5	11	9	7
December	23	15	8	18	5
<b>Total</b>	<b>169</b>	<b>97</b>	<b>72</b>	<b>140</b>	<b>29</b>

# MEDICAL SCIENCES RESEARCH

Milwaukee County Emergency Medical Services stands as a national model of an EMS Center of Excellence. Its participation in research further enhances the quality of care delivered, improves outcome for the citizens of Milwaukee, and establishes the standard of medical practice for the nation.

## Research

The Milwaukee County EMS system has had a long commitment to enhancing the quality of care provide to the sick and injured through the application of evidence based clinical practice. Our standards of care are based on data obtained through research studies conducted in Milwaukee County, throughout the United States and internationally.

## ROC Studies

In 2011 and 2012 Milwaukee County Emergency Medical Services (EMS) system continued our participation as one of the National Institutes of Health (NIH) ten centers for the Resuscitation Outcomes Consortium (ROC) to study the impact of promising clinical interventions on survival for patients with severe traumatic injury and cardiac arrest. As a ROC center, Milwaukee County EMS is an integral contributor to an epidemiological databank (Epistry) intended to help understand the burden of out-of-hospital cardiac arrest and life-threatening traumatic injury and to shed light on whether and how EMS process and geographic, socioeconomic and periodic variation may be associated with differences in outcome. Over the past two years, eight studies were conducted.

In 2011 & 2012 the following studies were conducted in the Milwaukee County EMS system;

## BLAST

(Biomarker Lactate for the Assessment of Shock in Trauma) The intent of this study was to compare prehospital lactate (P-LAC) levels to systolic blood pressure (SBP)  $\leq 90$  in predicting the need for resuscitative care (the administration of packed red blood cells (PRBCs), emergent intervention for hemorrhage control with thoracotomy, laparotomy, pelvic fixation or interventional radiologic control) or death prior to or within 6 hours of ED arrival in patients with  $70 < SBP \leq 100$  in the prehospital setting who have not received lactate ringers prior to lactate measurement. This study was completed at the end of 2012 and demonstrated that a prehospital Lactate reading is superior to using the systolic blood pressure as an indication of how severely injured a patient is. Presented at the American Heart Association Resuscitation Symposium, November 2012.

## PEDIATRIC INTRAVENOUS ACCESS

This study looked at the success rates of the paramedics to gaining intravenous access in pediatric patients.

## HYPOTENSIVE RESUS

The intent of this pilot study was to determine the feasibility and safety of hypotensive resuscitation for the early treatment of patients with traumatic shock compared to standard fluid resuscitation. In this study we looked at early administration in the field of intravenous (IV) fluids for trauma patients is an extension of clinical practice in the hospital for treatment of hemorrhagic shock. Currently, standard clinical practice is the rapid administration of IV fluid (IV bolus) for the patient with a systolic blood pressure (SBP) equal to 90 or less ( $SBP \leq 90$ ). This study will explore the feasibility and safety of using a lower threshold of  $SBP \leq 70$ .

## CCC (Continuous Chest Compressions)

Out-of-hospital cardiac arrest is common, life-threatening and debilitating. Greater blood pressure to the blood vessels feeding the heart muscle is associated with greater return of spontaneous. Interruptions in chest compression reduce this pressure. Previous studies in animal models of cardiac arrest show that a strategy of CCC is at least as efficacious as standard CPR. Observational studies in humans suggest that a strategy of CCC is efficacious compared to standard CPR. But each of these studies implemented multiple changes simultaneously, so it is difficult to assess the relative contribution of CCC versus other changes in CPR strategies to improve survival. Therefore a randomized trial of CCC versus standard CPR is being conducted to understand the role of pausing for ventilation during the circulatory phase of out-of-hospital cardiac arrests.

## NETT Network

The National Institutes of Health has also selected Milwaukee County EMS as a center for the Neurological Emergency Treatment Trials (NETT) Network. This consortium is responsible for implementing promising clinical interventions for patients with neurological emergencies such as stroke, uncontrolled seizures or meningitis.

## RAMPART: (Rapid Anticonvulsant Medication Prior to Arrival Trial)

The intent of this study was to determine the efficacy of intramuscular (IM) midazolam versus intravenous (IV) lorazepam in the pre-hospital treatment of status epilepticus. Efficacy will be assessed by the proportion of subjects with termination of clinically evident seizure determined at arrival in the Emergency Department (ED) after a single dose of study medication. Presented in the New England Journal of Medicine, February 2012.



Dr. Pirrallo (left)  
and Dr. Colella (right)

## MEDICAL DIRECTION

After twenty years of innovative leadership and commitment, Dr. Ronald G. Pirrallo retired as Director of Medical Services for Milwaukee County EMS. Under his tenure, MCEMS has developed as a nationally recognized EMS system. Dr. Pirrallo will remain clinically active in the Department of Emergency Medicine and engaged in various activities. He was bestowed the honorary title of Medical Director Emeritus.

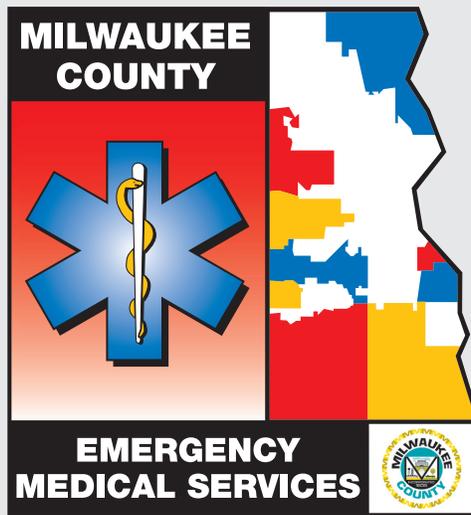
M. Riccardo Colella, DO, MPH, FACEP assumed the Director of Medical Services role and Chief of the Section of EMS and Disaster Medicine in the Department of Emergency Medicine at the Medical College of Wisconsin. Dr. Colella has almost 30 years of EMS related experience in various EMS roles and assignments and is “absolutely thrilled to be involved in such an incredible EMS agency.” Please visit the Milwaukee County EMS YouTube site to hear his introduction <http://www.youtube.com/watch?v=CcGVLp2gQJo>.

Medical Direction for MCEMS is supported by other faculty medical director associates in the Section of EMS and Disaster Medicine including Dr. Jason Liu (disaster and tactical), Dr. Charles Cady (State EMS Director), Dr. Lorin Brown (Pediatric EMS), Dr. Patrick Drayna (Pediatric EMS), Dr. Sean Marquis (EMS Fellow), Dr. Khalid Ateyyah (International EMS Fellow) and Dr. Brooke Lerner (EMS research).

On-Line Medical Direction serves as a vital resource connecting our EMS professionals to emergency medicine physicians who supplement and direct care to the citizens and visitors of Milwaukee County. MCW responded to over 1,325 medical direction requests in 2012.

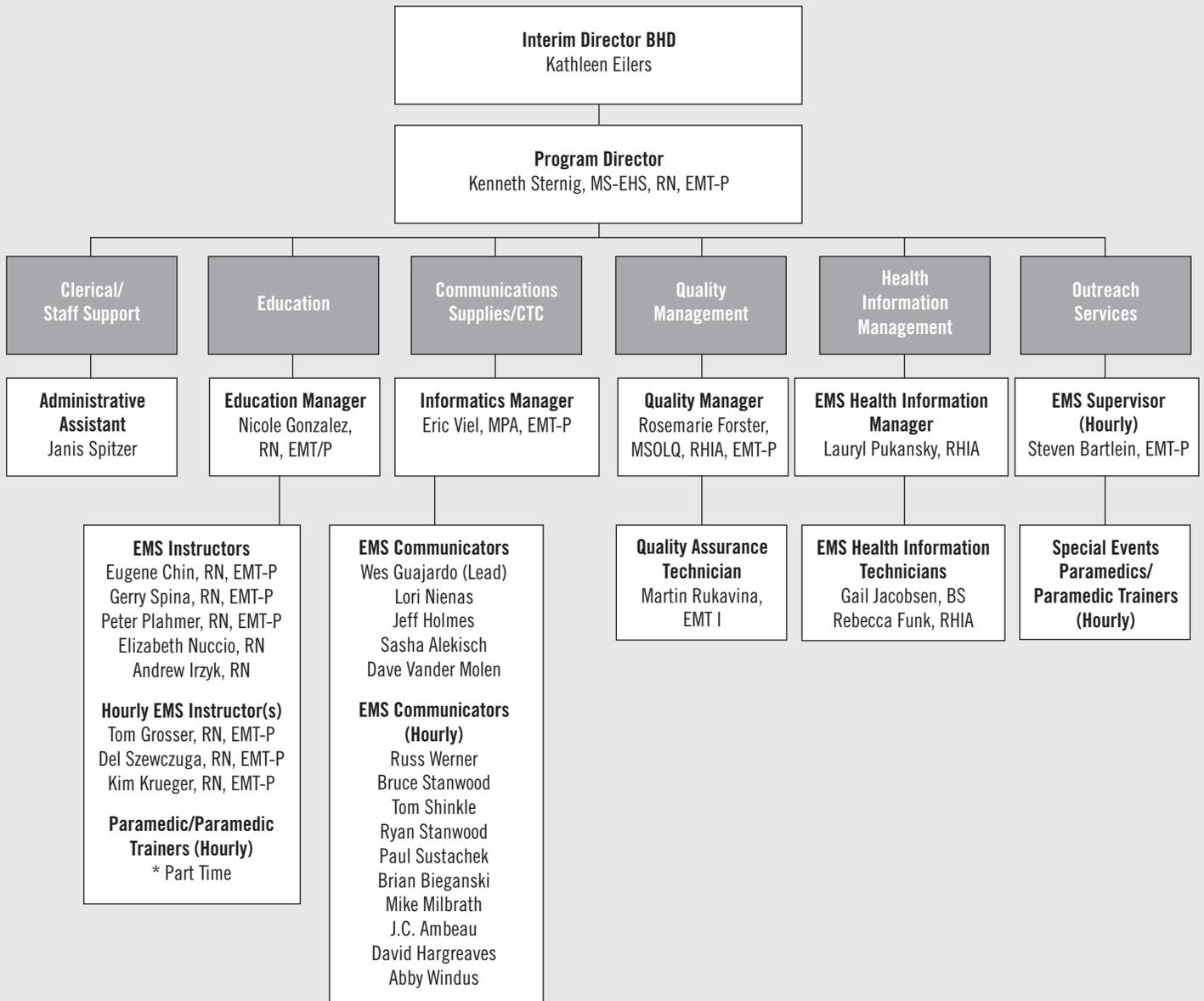
“EMS is a medical subspecialty that involves prehospital emergency patient care, including initial patient stabilization, treatment, and transport in specially equipped ambulances or helicopters to hospitals.” To that end, the subspecialty of EMS has been formally recognized by the American Board of Emergency Medicine. The Section of EMS and Disaster Medicine in the Department of Emergency Medicine at the Medical College of Wisconsin in conjunction with MCEMS continues the tradition of training future EMS leaders through various fellowship programs.

Physician leadership is a critical component to the success of our EMS system!



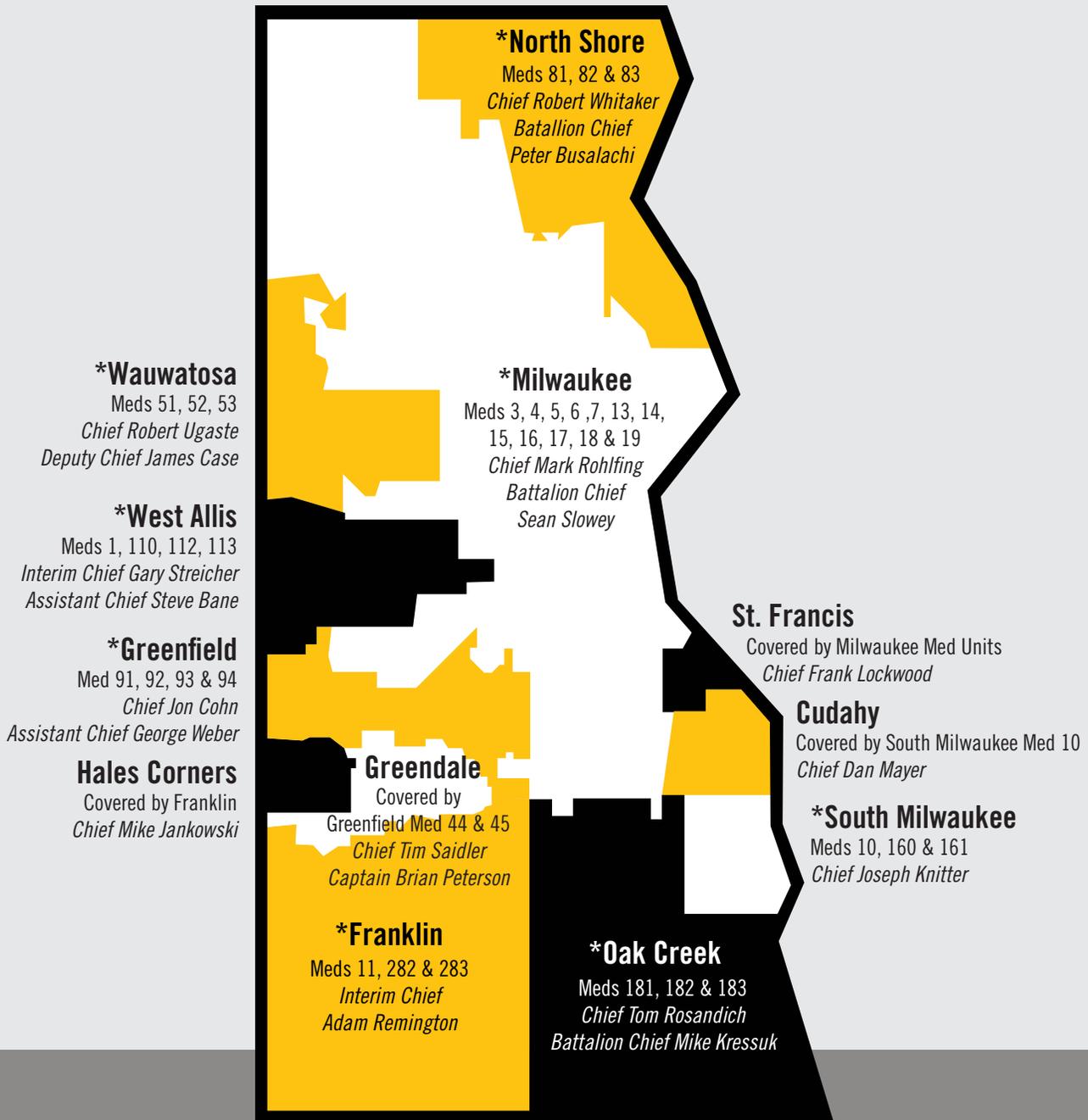
Nationally Recognized, Locally Respected.

# Milwaukee County Emergency Medical Services Organizational Chart



# PARAMEDIC UNIT LOCATIONS

Several municipalities who MC EMS contracts with to provide paramedic services\*, added paramedic transport units to their fire departments. As of the end of 2012 there are 37 fire department paramedic transport units within Milwaukee County.



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