Organization and Management for Hospitals and EMS Agencies for the Greater Kansas City Metropolitan Area

A Community Plan for Emergency Department High-Volume and Saturation

v. 2024

Reviewed and Revised: January 2024
Accepted: March 15, 2024

Review schedule and summary of revisions

This plan shall be reviewed and accepted by the Regional Diversion Work Group of the Kansas City Metropolitan Healthcare Council on an annual basis. Additional review is permitted if the regional situation warrants and both approving parties agree.

Initial approval	March 27, 2002	
Initial implementation	May 1, 2002	
Revised	January 27, 2004	
Revised	February 14, 2005	
Revised	March 29, 2005	Addition of Saint Luke's East - Lee's Summit Campus to catchment areas
Revised	June 1, 2005	Addition of new Trauma Only status
Revised	March 13, 2007	Addition of Centerpoint Medical Center to catchment areas and pending removal of Independence Regional Medical Center and Medical Center of Independence due to expected closure in late spring 2007. Removal of Baptist Lutheran Medical Center (now Research Medical Center Brookside Campus) due to limited inpatient capabilities.
Revised	March 30, 2007	Addition of Olathe Medical Center to Menorah Medical Center catchment area

Revised	February 13, 2008	Clarification of protocols and time frames for each EMResource status category, removal of Independence Regional Medical Center and Medical Center of Independence due to opening of Centerpoint Medical Center, plus notation of ED at Lee's Summit Medical Center – Summit Ridge Campus.
Revised	May 21, 2009	Add EMS trauma routing criteria language
Revised	November 16, 2009	Add provision to temporarily suspend "Closed to Ambulance" during region saturation
Revised	March 24, 2011	Add new STEMI and Stoke Center diversion categories; change all references from EMSystem® to EMResource® (May 2, 2011, implementation date)
Revised	March 13, 2013	Updated hub and catchment areas with hospital name changes as well as the footnotes to include Children's Mercy South.
Reviewed and Approved	August 14, 2014	
Revised	August 18, 2015	Updated reference on page one to the Medical Society of Johnson/Wyandotte County EMS Physicians Advisory Committee.
Revised and Approved	August 11, 2016	Minor edits and changes to Trauma Center references, plus two significant policy modifications to 1) permit patient requests: and 2) change the definition of "Closed to Ambulances" which will automatically return closed EDs to "Open" status following one hour of elapsed time.
Reviewed and Approved	September 12, 2017	Agreed to evaluate and modify EMResource® definitions for ED and TCD Diversions prior to next annual review.

Revised and Approved	October 30, 2018	Plan edits to modify language to reflect actual practice. Diversion terminology was replaced with status changes when hospitals experience high volume, addition of micro hospitals and standalone emergency rooms.
Reviewed and Approved	December 18, 2019	
Reviewed and Updated	November 6, 2020	Clarifying edits to catchment areas and hospital nomenclature.
Review and Updated	November 19, 2021	Clarifying edits and language in EMResource. Addition of NEDOCS® scoring and process. Addition of attachment B related to hospitals excluded from regional saturation status changes.
Plan approved	February 18, 2022	Approved by MARCER
Revision and review	January 2024	Plan edits to remove use of catchment areas as recommended by RHSCC Hospital Committee. Plan sections referring to Time Critical Diagnoses (TCD) removed from this plan and moved, when deemed appropriate, to TCD plan.
Plan approval	March 15, 2024	MARCER approval

COMMUNITY PLAN FOR AMBULANCE ROUTING DURING HOSPITAL HIGH-VOLUME AND REGIONAL SATURATION FOR THE GREATER KANSAS CITY METROPOLITAN AREA

BACKGROUND

The Diversion Work Group of the Kansas City Metropolitan Healthcare Council and Mid-America Regional Council Emergency Rescue (MARCER) Committee have adopted ambulance routing guidelines for the greater Kansas City metropolitan area.

Each metropolitan EMS agency has a set of protocols and policies approved by their medical director and/or medical control board. These include ambulance routing protocols. The specific protocols utilize the hospital emergency department high-volume status while acknowledging TCD diversion information supplied by a region wide, real-time tracking system and help the paramedic on the street make routing decisions with or without radio contact with a medical control physician. The ambulance routing protocols of the largest metropolitan EMS systems (Kansas City, Missouri EMS System with its Emergency Physicians Advisory Board, the Kansas City, Kansas EMS System and Kansas City Medical Society, Johnson County MedAct), while similar, are not the same. In addition, there are multiple smaller EMS agencies with their own protocols.

In 2018, the Kansas City Region moved away from general emergency department (ED) diversion. In lieu of diversion, Kansas City Region hospitals instead utilize advisory messages within EMResource® for situational awareness. These advisory messages, as denoted below, provide information related to ED volume and saturation which may be used to assist in routing decisions and/or load-balancing in times of regional saturation.

Note, this plan does not address or affect any facility's ability to accept or divert patients with Time Critical Diagnoses (TCD) nor does it address or affect the EMS routing of such patients. For guidance related to TCD, please refer to facility specific plans, state regulations, and the MARCER and Missouri Kansas City EMS Region Time Critical Diagnosis Plan.

In 2021, in response to regional challenges associated with the COVID-19 pandemic, additional strategies were explored to increase standardization and communication of hospital high-volume throughout the region, including the use of the National Emergency Department Overcrowding Score (NEDOCS®).

In 2023, the Hospital Committee of the MARC Region Health Care Coalition recommended discontinuing use of multiple catchment areas in the region. This effort will reduce alarm fatigue for end-users in emergency departments. The continued utilization of ED status updates, as described and defined in this plan, in combination with timely, appropriate use of NEDOCS® as an objective measurement of emergency department over-crowding continue to be important to maintain regional situational awareness.

EMResource®

MARCER, with the endorsement and cooperation of multiple agencies, organizations, and hospitals, has implemented EMResource® across the Kansas City metropolitan region. EMResource® is a Web-based program providing real-time information on hospital emergency department status, hospital patient capacity, availability of staffed beds and available specialized treatment capabilities. EMResource® is used to coordinate "routine" and emergency medical operations (e.g., mass casualty incidents or MCIs) throughout the region.

The EMResource® is an information system. With EMResource®, the definition of hospital status is standardized across the entire Kansas City metropolitan area. Emergency medical providers and/or emergency medical systems should continue to follow their local policies and procedures regarding the determination of hospital destinations. It is up to each EMS agency to determine what they will do with the status information on and further communicate their operational plans to their respective hospitals of interest. EMResource® provides standardized information to facilitate patient routing decisions.

NEDOCS®

Saturation Scores allow hospitals to calculate the degree of saturation or overcrowding in their Emergency Departments (EDs) so the facility can accurately communicate its availability and, potentially, reduce overcrowding.

NEDOCS® is a saturation scoring tool that takes a variety of factors into account, including the number of ED patients, beds, and admissions. It also measures ED throughput—the time it takes from the moment the patient entered the ED to admission or discharge. This tool is widely used and validated in its ability to predict and report ED overcrowding. Standard, timely updates of NEDOCS® is essential to maintain regional situational awareness.

Scoring and calculation information can be found in Appendix A.

POLICY

1. Patient care and safety should be the central consideration in all ED status change decisions. EMS should consider alternative destinations for patient routing when hospitals experience high volume.

2. The decision to communicate a change in status should be based on the immediate capabilities and capacities of the emergency department and institution to care for patients.

3. Patients who are in cardiac arrest will be taken to the closest appropriate hospital unless the hospital is listed "out of service." Patients who are "unstable" may still be taken to the closest appropriate hospital unless it is listed "out of service".

A. For specific guidance related to the transport of patients with a Time-Critical Diagnosis (TCD), please refer to the *MARCER and Missouri Kansas City EMS Region Time Critical Diagnosis Plan.*

4. Patients should be transported to the facility of their choice. Based on local protocols and applicable state regulations, the transporting agency will determine if the patient's desired facility is appropriate and shall consider department guidelines when determining transport destination.

   A. If a patient requests transport to a facility that is experiencing high-volume and is informed of this status, then the medic may take the patient to the hospital of their choice. EMS agencies shall follow their local policies regarding appropriate documentation of such patient requests.

5. No facility can close to patients on the basis of ability to pay.

6. Hospitals changing their status must do so prior to being notified of an ambulance's impending arrival (i.e., hospitals will not advise "High Volume-OPEN to an ambulance in route to their facility). During mass or multi-casualty incidents (MCI) the EMS agency may distribute patients to multiple facilities in order to optimize utilization of resources.

7. Hospitals shall consider the standardizing effect of NEDOCS® scoring when developing policies and procedures related to emergency department status changes.

   A. Standard, timely updates of NEDOCS® is essential to maintain regional situational awareness and may inform real-time EMS transport decisions.

      1 The regional threshold for consideration of "High Volume-Open" is 181 or higher.

      2 Facility conditions may dictate the need to indicate "high volume-open" at scores of less than 181. In these cases, facilities are asked to indicate these extenuating circumstances in comments.

      3 Facilities may have scores greater than 181 but choose to remain in OPEN-Normal Operations status. This is a facility-led decision.

8. Status notifications should be made to all EMS providers, hospitals and EMCCs (Emergency Medical Coordination Centers) through EMResource®.

   A. In the event of a local problem with EMResource® updates may be made via the following:

i the EMResource® mobile application,

ii contacting the MARC HCC Duty Officer to make changes on the facility's behalf,

iii the appropriate EMCC can be contacted by phone or FAX and enter the notification into EMResource® on the facility's behalf.

9. In the event hospital EDs across the region become saturated, as defined by '*any time one half of the metropolitan area facilities not otherwise excluded as described in Appendix B*,' are indicating "high volume-open" or during a large-scale mass casualty incident occurrence, the region will implement Regional Saturation protocol.

   A. The suspension of "high volume-open" will be in effect for an eight (8) hour consecutive period and then re-evaluated. During this time, all facilities indicating "high-volume-open" will be placed in "REGIONAL SATURATION-OPEN" status.

   B. During the 8-hour suspension, any facility may elect to return to "OPEN" status if over-crowding conditions improve.

   C. During the 8-hour suspension, any facility not previously placed in "REGIONAL SATURATION-OPEN" status, that experiences deteriorating conditions or increased overcrowding, may elect to place their facility in "REGIONAL SATURATION-OPEN" status.

   D. The temporary suspension does not affect other EMResource® categories related to TCD or out of service conditions.

   E. Regional facilities excluded from this provision are outlined in Appendix B.

10. This plan makes a clear distinction between emergency transport of patients who require emergency care and individual hospital policies regarding the transportation and receiving of patients for direct admission to the hospital. Specific examples include but are not limited to patients who require hospital admission from a primary care physician's office, recently discharged surgical patients, or patient transport from a nursing home to a hospital for non-life-threatening conditions. Hospitals whose emergency departments become overwhelmed and are experiencing "high volume-open" may continue to accept such patients by ambulance for direct admission to the hospital. Since direct admission policy and procedures may vary from one hospital to another, EMS agencies and hospitals are encouraged to work closely together to coordinate direct admissions to avoid additional congestion in the ED.

11. MARCER and the Kansas City Metropolitan Healthcare Council have jointly developed a process to track hospital statuses, to monitor trends, to monitor compliance with protocols and to produce appropriate reports for routine review.

DEFINITIONS

ED Status Categories and Definitions:
Note: All hospitals must update their ED STATUS and NEDOCS score status at least two times a day at 0800 and 2000.

OPEN-Normal Operations – The hospital ED is open to all ambulance traffic.

HIGH VOLUME-OPEN – The hospital ED is experiencing high volumes. When appropriate, alternate destinations should be evaluated for patient routing. The decision for this status change has been reviewed and approved by appropriate organizational leadership with the understanding that it is a solution of last resort to mitigate high volumes.

REGIONAL SATURATION-OPEN: More than half of designated regional facilities are indicating "high volume-open" resulting in an 8-hour suspension of this status.

OUT OF SERVICE** – The emergency department has suffered structural damage, loss of power, an exposure threat or other conditions that preclude the admission and care of any new patients.
Note: EMResource® must be updated each hour (at one-hour intervals) when on "OUT OF SERVICE" status.

***Because EMResource® is monitored by the Missouri Department of Health and Senior Services Emergency Response Center for broad health infrastructure situational awareness, failure to provide detailed information regarding this status change will result in follow up communication from state public health staff.*

PROCEDURES

1. The decision to initiate or terminate a status change rests with the individual hospital according to their internal policies and/or protocols.

2. NEDOCS criteria–can be used to determine the necessity of implementing an emergency department status.

3. The status change is initiated or terminated using EMResource® according to the EMResource® Protocols and Policies.

4. For participating Missouri hospitals in the Kansas City region, the EMResource® will automatically notify the Missouri Department of Health and Senior Services (DHSS) of a change in hospital status via their EMResource® view. In the event that EMResource® is not operational at the time of the status change, participating Missouri hospitals will send DHSS a fax notification or, by other electronic means, report the commencement of status change.

5. The appropriate EMCC and/or EMS dispatch center assures that ambulance crews in the field are informed of hospital status, and NEDOCS score if applicable, on a "real-time" basis through their own written policies, protocols or standard operating procedures.

6. The ambulance crews in the field use all appropriate information to make the destination determination. In some systems this may also include on-line contact with a medical control physician.

7. Within eight (8) hours of termination of the status change, participating Missouri hospitals in the Kansas City region will report the following information to the Missouri DHSS via EMResource® or by other electronic means:

    A. time of status change initiation
    B. name of individual who made the decision to implement the status change
    C. reason for the change of status
    D. time the status change was terminated
    E. name of the individual who made the decision to terminate the change of status

REFERENCES

1. American College of Emergency Physicians Policy Education Resource Paper: *Guidelines for Ambulance Diversion*; AEM 36:4 376-377

2. *East Metro Ambulance Diversion Policy*; East Metro Hospital, St. Paul, MN, June 30, 2000

3. *Emergency Department Diversion Guidelines of the St. Louis Emergency Physicians Association*; St. Louis, MO August 2000.

5. Missouri Code of State Regulations. Department of Health and Senior Services, Division 30 – Division of Regulation and Licensure. 19 CSR 30-20.092 Diversion. https://www.sos.mo.gov/cmsimages/adrules/csr/current/19csr/19c30-20.pdf

6. *National Association of Emergency Medical Services Physicians Position Paper: Ambulance Diversion*; approved by the NAEMSP Board of Directors, July 26, 1995.

7. Weiss, S., Derlet, R., Arndahl, J., Ernst, A., Richard, J., et al. *Estimating the Degree of Emergency Department Overcrowding in Academic Medical Centers: Results of the National ED Overcrowding Study (NEDOCS).* Academic Emergency Medicine, vol 11(1; p. 38-50). Published January 8, 2008.

APPENDIX A: NEDOCS Fields and Calculation

EMResource uses the following formula and the data in the form's fields to calculate NEDOCS.

NEDOCS = 85.8(C/A) + 600(F/B) + 13.4(D) + 0.93(E) + 5.64(G) – 20

You need to determine the following values for entry into the NEDOCS form.

Field	Definition	Description
A	Number of ED Beds	Total number of ED beds available or staffed, including hallways and chairs
B	Number of Inpatient Beds	Total number of inpatient beds (excluding PEDS and OB)
C	Number of ED Patients	Total number of ED patients, including hallways, chairs, admissions, and waiting room
D	Number of Critical Care Patients (in ED)	Total number of critical care patients in the ED (1:1 ratio, ventilators, psych, or ICU patients)
E	Longest ED Admit (in hours)	Longest admission time waiting in the ED; 15-minute increments; example: enter 2.25 for 2 1/4 hours
F	Number of ED Admits	Total number of ED admissions waiting in the ED (that is, waiting for an inpatient bed)
G	Last Door-to-bed Time (in hours)	Door-to-bed time for the last ED patient to get an ED bed; 15-minute increments; example: enter 2.25 for 2 1/4 hours

The following table shows the scale for NEDOCS. By default, these ranges have already been color-coded in EMResource to aid users in quickly detecting the current level of overcrowding. The calculated score appears in the color specified for that score.

Scale	Definition	Default Color	Default Label
00-20	ED is not busy	Green	Normal
21-60	ED is busy	Blue	21-50 Normal 51-60 Busy
61-100	ED is extremely busy but not overcrowded	Yellow	Busy
101-140	ED is overcrowded	Purple	Overcrowded
141-180	ED is severely overcrowded	Red	Severe
181 and higher	ED is dangerously overcrowded	Black	Disaster

APPENDIX B: Facilities Excluded from "Regional Saturation-OPEN"

Due to the specific challenges associated with critical access rural facilities, the following hospitals are excluded from status changes related to Kansas City Metro area hospital saturation.

Missouri Region A: Northern District	Carroll County Memorial Hospital
	Fitzgibbon Hospital
	Ray County Memorial Hospital
	Lafayette Regional Medical Center
Missouri Region A: Southern District	Bothwell Regional Health Center
	Golden Valley Memorial Healthcare
	Western Missouri Medical Center
	Bates County Memorial

Additionally, the following hospitals are not included in "Regional Saturation-OPEN" for the reasons identified.

Hospital	**Reason for Exclusion**
Children's Mercy Kansas City - Adele Hall Children's Mercy Kansas	Special population: Pediatric capability
Veteran's Administration Hospitals, Kansas City and Leavenworth	Special population
Research Medical Center-Brookside Campus	Limited inpatient capabilities
Overland Park Regional of Olathe Overland Park Regional of Shawnee Overland Park Regional Pediatric ER-Overland Park Saint Luke's Community Hospital at Leawood Saint Luke's Community Hospital at Legends Saint Luke's Community Hospital at Roeland Park AdventHealth Lenexa AdventHealth College Blvd.	Micro hospital or standalone ER: Limited inpatient capacity