Organization and Management for Hospitals and EMS Agencies

For the Greater Kansas City Metropolitan Area

A Community Plan for Diversion
v. 2021

Reviewed and Revised: November 19, 2021
Approved: Feb 18, 2022

Initial Approval Date: March 27, 2002
Initial Implementation Date: May 1, 2002

Review schedule and summary of revisions

This plan shall be reviewed and accepted by the Diversion Work Group of The Health Alliance of MidAmerica and the Mid-America Regional Council Emergency Rescue Committee no less frequent that on an annual basis. Additional review is permitted if the regional situation warrants and both approving parties agree.

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	Plan approved by MARCER
Plan approved	April 5, 2022	Plan approved by KCMHC Diversion Workgroup

COMMUNITY PLAN FOR AMBULANCE ROUTING FOR THE GREATER KANSAS CITY METROPOLITAN AREA

BACKGROUND

The Diversion Work Group of the Health Alliance of MidAmerica and Mid-America Regional Council Emergency Rescue (MARCER) Committee have adopted ambulance diversion 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 diversion status" 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), while similar, are not the same. In addition, there are multiple smaller EMS agencies with their own protocols.

In 2018, the Kansas City workgroup began managing ED Diversions through identification, coordination and communication of hospitals experiencing high volumes.

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®).

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 and inform real-time EMS transport decisions. The NEDOCS tool is not validated to be used in specialized hospitals that treat only pediatric patients.

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 your 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

POLICY

1. Patient care and safety should be the central consideration in all 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. (An exception is TCD diversion, in which availability of necessary equipment or trained staff may be temporary unavailable.)

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" or on "trauma diversion" (for "unstable" trauma patients only).

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 EMS providers 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. Designated trauma centers may close to ambulances carrying patients who meet EMS trauma routing criteria.

6. Designated trauma centers may remain open for EMS trauma routing while the ED is experiencing high volume.

7. Designated STEMI and/or stroke centers may close to ambulances that have patients that meet TCD routing criteria for STEMI and/or stroke.

8. Designated STEMI and/or stroke centers may remain open for patients meeting TCD routing criteria while the ED is experiencing high volume.

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

10. 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.

11. 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 inform real-time EMS transport decisions.

        i Regional threshold for consideration of "high volume-open" is 181 or higher.

        ii 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.

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

12. Status notifications should be made to all EMS providers, hospitals and EMCCs (Emergency Medical Coordination Centers) through EMResource®. (If there is a local problem with EMResource®, the appropriate EMCC can be contacted by phone or FAX and enter the notification into EMResource®.)

13. If all hospitals within a predefined catchment area are experiencing high volume, then all hospitals in the catchment area will have their status changed to "catchment area-open" and the patient will be taken to the closest appropriate hospital within the catchment area (with the exception of hospitals that are out of service).

    A. If all hospitals in a catchment area are indicating "high volume-open" and therefore all hospitals in the catchment area have their status changed to "catchment area-open" then ambulances transporting patients to these hospitals will be distributed in a fashion so to equalize as much as possible the number of patients going to these hospitals.

B. If a trauma, STEMI or stroke center is in a catchment area in which all hospitals are now experiencing high volume, and as such all hospitals in the catchment area have their status changed to "catchment area-open," it does not automatically mean that the trauma, STEMI or stroke center is open for trauma, STEMI or stroke patients. (There are specific criteria that must be met in order to be designated a trauma, STEMI or stroke center.) That decision is made by the involved trauma, STEMI or stroke center.

14. In the event hospital EDs across the region become saturated as defined by any time one half of the metropolitan area catchment hospitals are indicating "high volume-open", "catchment area-open", or during a large-scale mass casualty incident occurrence, the EMResource® Administrator or Healthcare Coalition leadership has the authority to temporarily suspend the "high volume-open" option of the community plan.

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" or "catchment area-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 of the community plan does not affect other EMResource® categories related to TCD or out of service conditions.

E. Missouri Region A facilities located in the Northern and Southern districts as outlined in Attachment B are excluded from this provision.

15. The Kansas City community plan for ambulance diversion 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.

16. MARCER and the Health Alliance of MidAmerica 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 at least two times a day at 0800 and 2000.

OPEN – 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.
Note: Following a status change to "HIGH VOLUME-OPEN" the hospital shall complete and post its NEDOCS as appropriate.

CATCHMENT AREA-OPEN-: All hospitals within their catchment area are indicating high-volume-open.
Note: Hospitals must remain open with this status for at least one (1) hour before changing their status back to "HIGH VOLUME-OPEN"

REGIONAL SATURATION-OPEN: More than half of designated regional facilities are indicating "high volume-open" or "catchment area-open", resulting in 8-hour suspension of those statuses.
Note: Regional Health Care Coalition Duty Officers and Staff are responsible for status suspension and indication of "REGIONAL SATURATION-OPEN" in EMResource® after coordination with the Regional Health Care Coalition Threat Assessment Team.

OUT OF SERVICE** – The emergency department has suffered structural damage, loss of power, an exposure threat or other conditions that precludes 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.*

Time Critical Diagnosis Status Categories:

Unstable – unable to establish or maintain an airway
unable to ventilate
unremitting shock
as otherwise defined in appropriate EMS agency protocols, (including as determined with medical control contact)

CLOSED TO TCD – The emergency department is functioning but cannot accept ambulance patients for TCD due to a temporary resource limitation.

(PLEASE SELECT APPROPRIATE TCD LIMITATION)
Note: EMResource® must be updated each hour (at one-hour intervals) when on "CLOSED TO TCD" status.

OPEN TO TRAUMA – Designated trauma center is open for EMS trauma routing criteria.

CLOSED TO TRAUMA – Designated trauma centers may close to ambulances carrying patients who meet EMS trauma routing criteria.
Note: EMResource® must be updated each hour (at one-hour intervals) when on "CLOSED TO TRAUMA" status.

OPEN TO STEMI – Designated STEMI center is open to ambulances that have patients that meet STEMI routing criteria.

CLOSED TO STEMI – Designated STEMI centers may close to ambulances that have patients that meet STEMI ROUTING CRITERIA.
Note: EMResource® must be updated each hour (at one-hour intervals) when on "CLOSED TO STEMI" status.

OPEN TO STROKE – Designated stroke center is open to ambulances that have patients that meet stroke routing criteria.

CLOSED TO STROKE – Designated stroke centers may close to ambulances that have patients that meet stroke routing criteria.
Note: EMResource® must be updated each hour (at one-hour intervals) when on "CLOSED TO STROKE" status.

Hub Hospital – The hub hospital is defined as the preferred location for emergency care. The preferred hospital location factors may include:

- transport for trauma care
- transport for specialty care

- patient choice
- direct admissions
- proximity
- children's hospital

Catchment Area – Catchment areas are comprised of one hub hospital and three or more hospitals that are related by multiple factors such as ground time, capabilities and traffic flow for routing purposes. A hospital may be part of more than one group. These catchment hospitals are to be defined and reviewed at least annually by MARCER. Attachment A contains a list of participating hospitals and their respective catchment designations.

PROCEDURES

1. The decision to initiate or terminate a status change rests with the individual hospital according to their written policies.

2. NEDOCS criteria may 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.

4) EMResource® Protocols and Policies; MARCER, June 2000.

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

6) 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.

Attachment A

Kansas City Metropolitan Region
REGIONAL CATCHMENT AREAS FOR AMBULANCE ROUTING

Hub Hospital	Catchment Area
AdventHealth Shawnee Mission	Overland Park Regional Medical Center Olathe Medical Center***** Saint Luke's South Hospital***** AdventHealth Shawnee Mission University of Kansas Health System
AdventHealth South Overland Park	Saint Luke's South Hospital Overland Park Regional Medical Center Menorah Medical Center Olathe Medical Center***** St Joseph Medical Center***** AdventHealth South Overland Park
Centerpoint Medical Center	Centerpoint Medical Center Lee's Summit Medical Center Saint Luke's East Hospital St. Mary's Medical Center University Health- Lakewood
Lee's Summit Medical Center	Centerpoint Medical Center Lee's Summit Medical Center Research Medical Center***** Saint Luke's East Hospital University Health- Lakewood
Liberty Hospital	Liberty Hospital North Kansas City Hospital***** Saint Luke's North Hospital – Barry Rd*****
Menorah Medical Center	Menorah Medical Center Olathe Medical Center Overland Park Regional Medical Center St. Joseph Medical Center Saint Luke's South Hospital AdventHealth South Overland Park

North Kansas City Hospital	Liberty Hospital***** North Kansas City Hospital Saint Luke's North Hospital – Barry Rd***** University Health-TMC
Olathe Medical Center	Menorah Medical Center***** Olathe Medical Center Overland Park Regional Medical Center Saint Luke's South Hospital***** St. Joseph Medical Center AdventHealth South Overland Park*
Overland Park Regional Medical Center	Menorah Medical Center Olathe Medical Center Overland Park Regional Medical Center St. Joseph Medical Center Saint Luke's South Hospital AdventHealth Shawnee Mission AdventHealth South Overland Park
Providence Medical Center	Overland Park Regional Medical Center***** Providence Medical Center AdventHealth Shawnee Mission***** University of Kansas Health System*****
Research Medical Center	Research Medical Center St. Joseph Medical Center Saint Luke's Hospital of Kansas City University Health-TMC
St. Joseph Medical Center	Menorah Medical Center Olathe Medical Center Overland Park Regional Medical Center Research Medical Center St. Joseph Medical Center AdventHealth South Overland Park*
St. Mary's Medical Center	Centerpoint Medical Center Lee's Summit Medical Center * Saint Luke's East Hospital * St. Mary's Medical Center University Health-Lakewood*****

Saint Luke's Hospital of Kansas City	Research Medical Center Saint Luke's Hospital of Kansas City University Health-TMC University of Kansas Health System
Saint Luke's East Hospital	Centerpoint Medical Center Lee's Summit Medical Center Saint Luke's East Hospital St. Mary's Medical Center* University Health- Lakewood
Saint Luke's North Hospital – Barry Road	Liberty Hospital***** North Kansas City Hospital***** Saint Luke's North Hospital – Barry Road
Saint Luke's South Hospital	Menorah Medical Center Olathe Medical Center* Overland Park Regional Medical Center St. Joseph Medical Center AdventHealth South Overland Park St. Luke's South
University Health- Lakewood	Centerpoint Medical Center Lee's Summit Medical Center Saint Luke's East Hospital St. Mary's Medical Center University Health- Lakewood
University Health-TMC	North Kansas City Hospital Research Medical Center Saint Luke's Hospital of Kansas City University Health-TMC University of Kansas Health System
University of Kansas Health System	Research Medical Center Saint Luke's Hospital of Kansas City AdventHealth Shawnee Mission University Health-TMC University of Kansas Health System

* Indicates a greater than 15-minute drive time.

The following hospitals are not included in the catchment area designations for identified reasons.

Hospital	Reason for Exclusion
Children's Mercy Kansas City - Adele Hall Children's Mercy Kansas	Special population: Pediatric capability
Veteran's Administration Hospitals	Special population
Bates County Memorial Hospital (Butler, Missouri) Belton Regional Medical Center (Belton, Missouri) Cass Regional Medical Center (Harrisonville, Missouri) Excelsior Springs Hospital (Excelsior Springs, Missouri) Lafayette Regional Health Center (Lexington, Missouri) Saint John Hospital (Leavenworth, Kansas)	Geographic distance to the metropolitan region
Research Medical Center Brookside Campus	Limited inpatient capabilities
Overland Park Regional of Olathe Overland Park Regional of Shawnee Saint Luke's Community Hospital at Leawood Saint Luke's Community Hospital at Legends Saint Luke's Community Hospital at Roeland Park Saint Luke's Community Hospital at Olathe Saint Luke's Community Hospital at Shawnee AdventHealth Lenexa AdventHealth South Overland Park AdventHealth College Blvd.	Micro hospital or standalone ER: Limited inpatient capacity

Attachment B

Facilities Excluded from "Catchment Area-Open" and "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