

Missouri's Emergency Medical Care Time Critical Diagnosis System

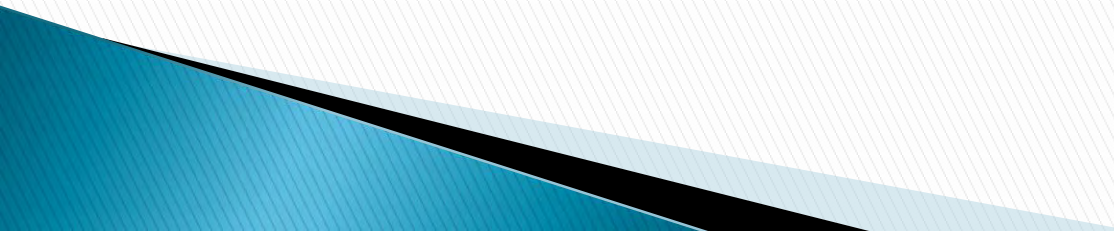
Past, Present, and Future

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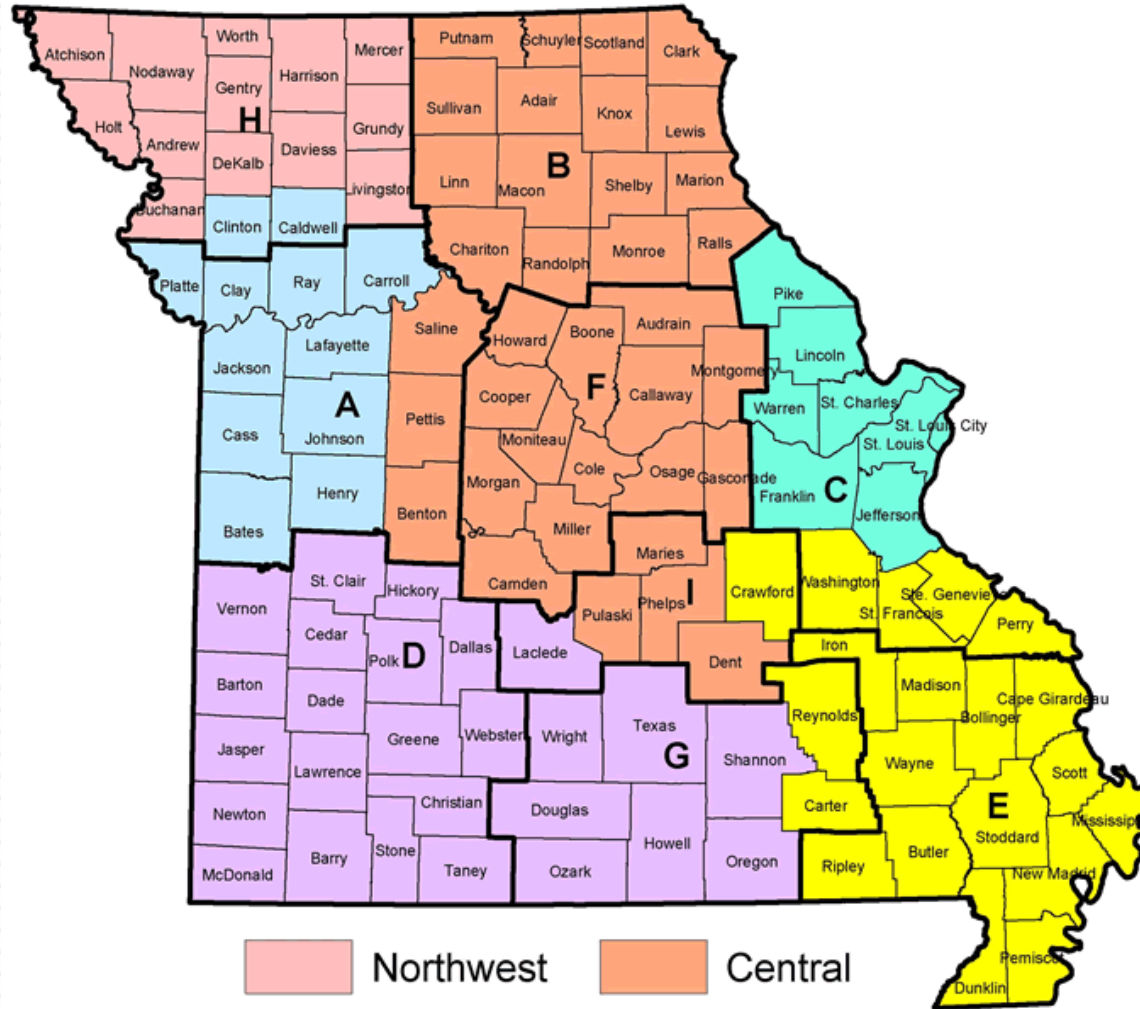
Missouri Department of Health and Senior Services

Objectives

- ▶ TCD Principles
 - The Public Health Model as a Foundation
 - ▶ The Need for TCD Approach in Missouri
 - ▶ Time Critical System Models
 - ▶ TCD History
 - ▶ Pre-Hospital TCD Elements
 - ▶ Trauma, Stroke, and STEMI Centers
 - ▶ Work Groups Underway
 - ▶ Next Steps
- 

TCD Principles

- »» The Public Health Model as a Foundation



- Northwest
- Central
- Kansas City
- East Central
- Southwest
- Southeast

TCD Principles: The Public Health Model

- ▶ Core Functions and Essential Services
 - Assessment
 - Monitor health status/Identify community health problems
 - Diagnose and Investigate health problems/hazards in the community

TCD Principles: The Public Health Model

- ▶ Core Functions and Essential Services
 - Policy Development
 - Inform, educate, and empower people about health issues
 - Mobilize community partnerships to identify and solve health problems
 - Develop health policies and plans to support individual and community health efforts

The Public Health Model as a Foundation

- ▶ Core Functions and Essential Services
 - Assurance
 - Evaluate effectiveness, accessibility, and quality of personal and population-based health services
 - Assure a competent public health and personal health care workforce
 - Link people to needed personal health services and assure the provision of health care when otherwise unavailable
 - Enforce laws and regulations that protect health and ensure safety

The Public Health Model as a Foundation

- ▶ Core Functions and Essential Services
 - Systems Management
 - Research for new insights and innovative solutions to health problems
 - Essential service that occurs throughout all three core functions

The Public Health Model as a Foundation

- ▶ Missouri's Plan for System Development
 - Use the 3 Core Functions and 10 Essential Services of Public Health
 - Use HRSA's Model Trauma System Planning and Evaluation to link public health and trauma in the long-term; and explore adaptation to stroke and STEMI
 - Consider recommendations from
 - American College of Surgeons Committee on Trauma
 - NHTSA's EMS Assessments
 - Healthy People

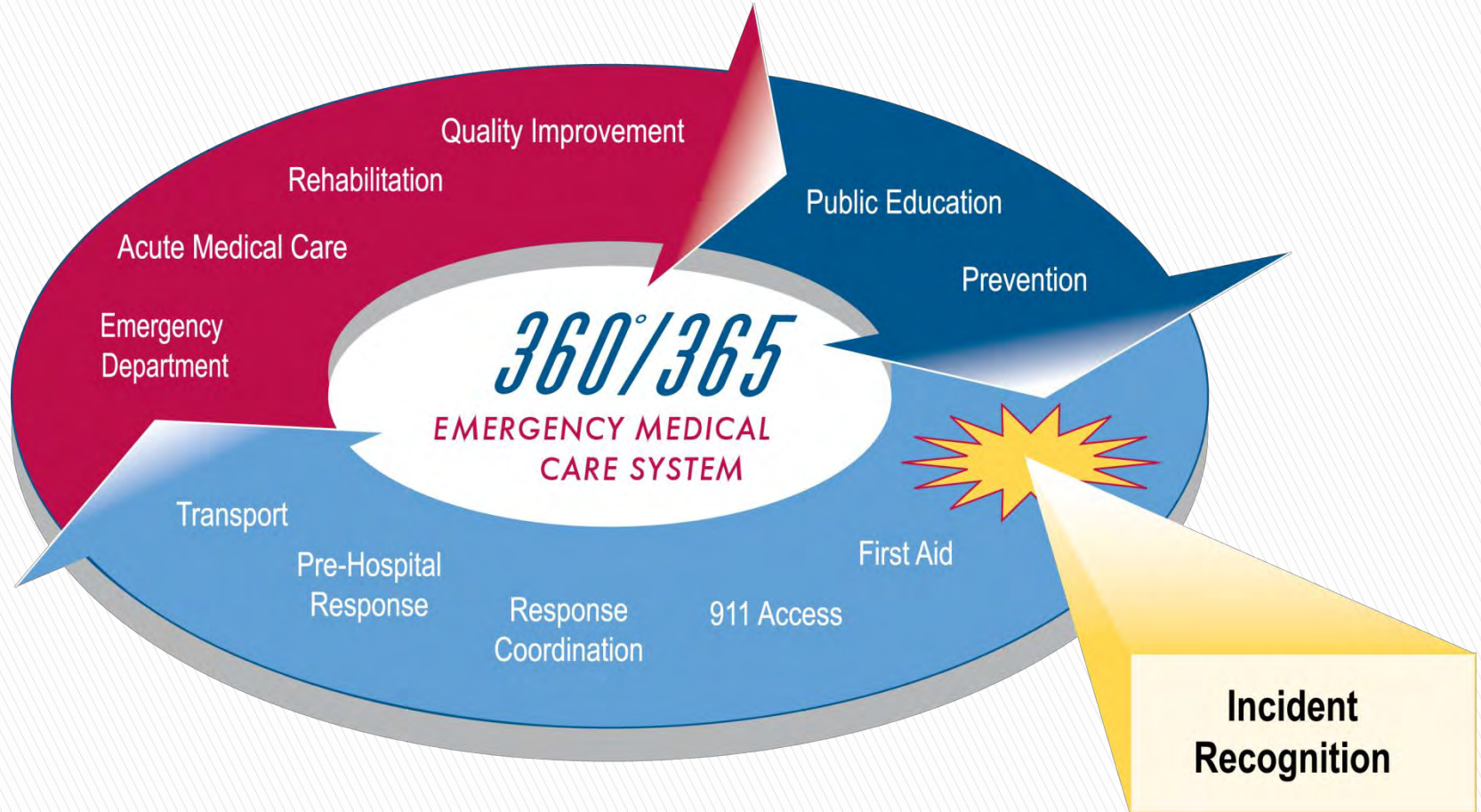
The Public Health Model as a Foundation

- ▶ Missouri's Goals:
 - Reduce incidence and severity of injury, stroke, and STEMI
 - Improve access into the system
 - Improve outcomes of those injured or suffering stroke and STEMI
 - Improve system evaluation and QA/QI/PI Processes

The Public Health Model as a Foundation

- ▶ Missouri's Key Guiding Principles
 - Patient centered care
 - Evidence-based system design
 - Population-based approach
 - Evaluation mechanism

The Circle



Why do We Need the TCD Approach in Missouri

- » Missouri's Trauma, Stroke, and STEMI Standings When We Began

Epidemiology in Missouri

Leading causes of death:

1st Heart Disease, including ST–Elevation Myocardial Infarction (STEMI)

3rd Stroke (4th currently in MO. and nationally)

1st/5th Unintentional Injury; Leading cause of YPLL

TRAUMA

- ▶ Unintentional Injury is the first or fifth leading cause of death in Missouri depending on group.
- ▶ Injuries and poisonings are the most frequent cause of visits to the emergency department, causing more than 2.7million ER visits between 2006 and 2010.
- ▶ Injuries and poisonings accounted for the second highest total for inpatient hospital charges – \$2.4 billion in 2010.
- ▶ Compared to the entire United States, Missouri has
 - lower rates of emergency department visits for all three major categories of injuries – unintentional, assault, and self-inflicted
 - Death rates that exceed the national rates for all unintentional injuries, falls, and motor vehicle injuries.
- ▶ Missouri's death rates for unintentional injuries have increased 23 percent between 1990 and 2010
- ▶ There are gaps, particularly in rural areas of Missouri, for timely access to a trauma center.

STROKE

- ▶ Stroke is now the fourth leading cause of death in MO. and nationally.
- ▶ In 2010, Missouri's stroke death rate was 12.5 percent higher than the national rate.
- ▶ Missouri has the 14th highest stroke mortality of all 50 states.
- ▶ Missouri ranked 4th in stroke prevalence in 2010.
- ▶ Only a small percent of ischemic stroke patients get definitive care within the 3 hour window recommended.

STEMI

- ▶ Heart disease, including STEMI, is the leading cause of death in this state.
- ▶ In 2010, Missouri's heart disease death rate was 12.7 percent higher than the national rate.
- ▶ Missouri has the 10th highest heart disease mortality of all 50 states in 2010.
- ▶ The prevalence of heart disease was higher than the national average
 - Missouri ranked 13th among the 50 states in heart disease prevalence in 2010.

Time Critical System Models

» Application to Stroke
and STEMI

The Trauma System as a Model for Time Critical Events

Trauma System:

- Improves Patient Outcomes and Saves Lives
 - 50% reduction in preventable death rate after implementation
 - Decrease in cases of sub-optimal care from 32% to 3%
- ▶ Improves Hospital Outcomes
 - Better outcomes compared to voluntary system
 - Cost Savings through more efficient use of resources
- ▶ Improves Regional Outcomes
 - Regional system accommodates regional and local variations

STROKE

Prompt treatment reduces death and disability.

STROKE

- ▶ t-PA Treatment within 180 minutes from symptom onset:
 - Better odds of improvement at 24 hours
 - Improved 3-month outcome
- ▶ Patients treated after 180 minutes
 - Poorer outcomes
 - More hemorrhages

STEMI

Prompt treatment reduces death and disability.

STEMI

- ▶ Shorter time from door-to-balloon (PCI) – lower risk of mortality
 - Moving towards first medical contact to balloon
- ▶ Symptom onset to treatment time greater than 4 hours independent predictor of one-year mortality
- ▶ Faster treatment and lower in-hospital mortality associated with hospital “specialization” and emphasis on PCI as principal mode of reperfusion

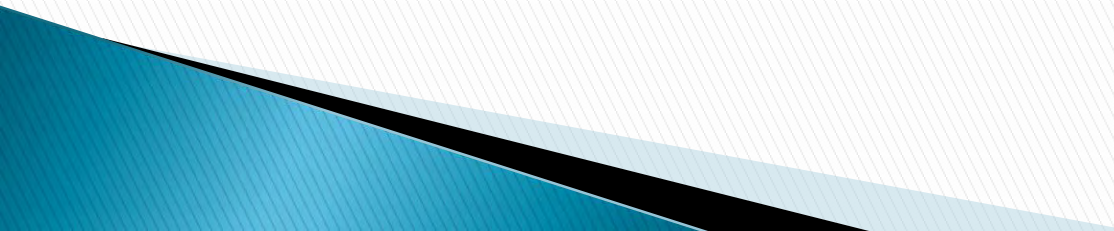
TCD History



TCD Project History

- 2003 Missouri Foundation for Health (MFH) identified the need for EMS/Trauma Reform
- 2005 Dr. Bill Jermyn accepts State EMS Medical Director Position
- 2006 Emergency Medical Care System planning
- '07-08 First Stroke/STEMI TCD Task Force
Trauma Gap Analysis
- 2008 TCD System Authorizing Legislation
- 2008+ Time Critical Diagnosis Trauma, Stroke and STEMI Task Force development and implementation teams
- 2009 ACS COT Review
- 2010 NHTSA Review
- 2010-11+ TCD Task Force Work Groups: Professional Education, Public Education, Quality Assurance, Stroke-STEMI-Resources and Recommendations, 9-1-1 Coordination, Rural-Urban Coordination
- 2012 Stroke/STEMI Rules filed; Trauma Rules in Internal Review

Leadership and Collaboration

- ▶ Department leadership support for emergency medical care in collaboration with Dr. Bill Jermyn
 - ▶ Support from the Missouri Foundation for Health, the CDC, and national EMS leaders
 - ▶ Interagency collaboration, including DSS, DOL, and DOI
 - ▶ Dedication and commitment of ad hoc Trauma, Stroke, and STEMI Task Forces, now roughly 700 people from across the state
 - ▶ External Leads
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Missouri Regulations

Legislative Synopsis:

2008: House Bill 1790 enabling reform passed unanimously by the Missouri General Assembly and signed into law

Section 190-100, RSMo Definitions

Section 190.200, RSMo Public Information & Education

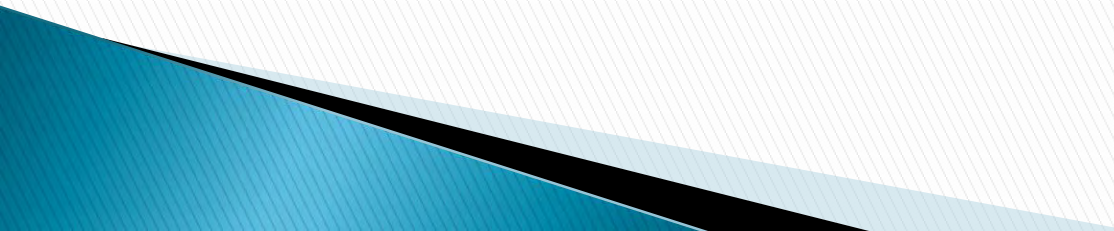
Section 190.241, RSMo Center Designation

Section 190.243, RSMo Transportation to Centers

Implementation: Progress and Goals

- ▶ Voluntary process
- ▶ Trauma, Stroke, STEMI program–24/7 (all levels)
 - Medical Director
 - Program Manager/Coordinator
- ▶ Staff meet and maintain core requirements to provide care
- ▶ Transport Protocols
- ▶ Injury Specific, Stroke/STEMI, and Helicopter Utilization Recommendations
- ▶ Transfer – network agreements

Implementation: Progress and Goals

- ▶ Data submission for statewide registry
 - ▶ Performance improvement and patient safety requirements
 - ▶ Professional Education Resources
 - ▶ Public education to promote prevention and signs and symptoms awareness
 - ▶ Coordination with 9-1-1 / PSAPs
 - ▶ Rural-Urban Coordination Steps
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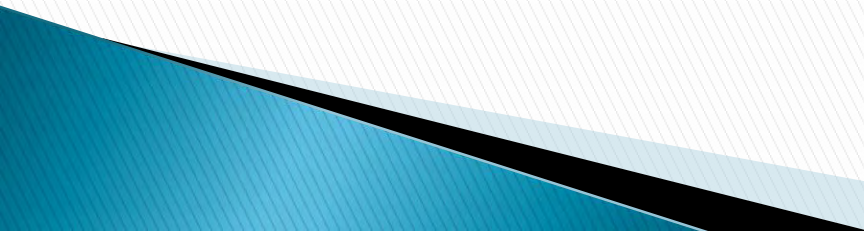
Pre-Hospital TCD Components



Linking Pre-Hospital and Hospital TCD Trauma, Stroke, and STEMI Care

- ▶ Current protocol – unlike trauma, which triages to a trauma center, ambulances triage to the nearest hospital for stroke or STEMI, not necessarily a facility equipped to deliver necessary level of care for stroke or STEMI
- ▶ Patients who self-transport may not have the knowledge to go to the right facility
- ▶ Rural populations face unique challenges in access to timely care

Pre-Hospital TCD Components

- ▶ Trauma Transport Protocol (Draft)
 - ▶ Trauma Classification and Injury Specific Recommendations
 - ▶ Stroke/STEMI Transport Protocols
 - ▶ Stroke/STEMI Classification, EMS, and Inter-facility Recommendations
 - ▶ Helicopter Utilization Recommendations
 - ▶ Community Plans
 - ▶ Integration of 9-1-1 / PSAPs
- 

Linking Pre-Hospital and Hospital TCD Care

- ▶ Speaking a common unifying language throughout the state:
 - Transport Protocol
 - linking the pre-hospital setting to the hospital setting
 - linking patient presentation to a level of care
 - Other Injury specific, stroke, and STEMI Resources
 - Helicopter Utilization Recommendations
- ▶ Resource Considerations
 - Common goals through the above, different approaches based on location

Linking Pre-Hospital and Hospital TCD Care

- ▶ Speaking a common unifying language throughout the state:
 - Recommendations for 9-1-1 Coordination
 - Pilot study/data element integration for QA/PI
 - PAI/EMD Recommendations
 - Recommendations for Rural-Urban Coordination, including:
 - Tool Kits
 - What to do with patients you can't move
 - Hand-offs
 - How to make process more efficient

Community or Regional Plans

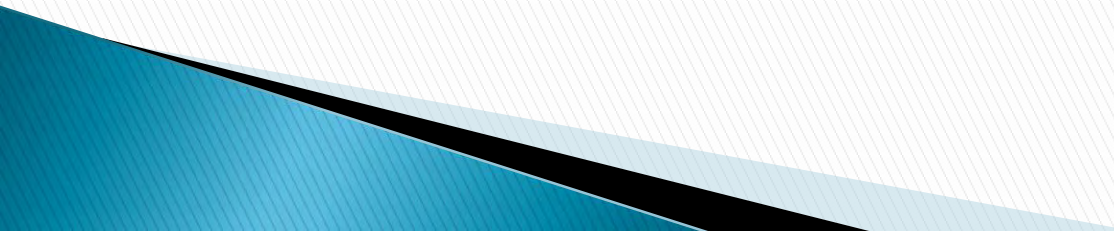
Regional or community based plans (section 190.200 RSMo) for transporting trauma, STEMI or stroke patients may be submitted to DHSS but it is not required to do so if using the state transport protocols

Hospital TCD Components: Trauma, Stroke, and STEMI Centers



Missouri Regulations Trauma, Stroke, & STEMI

Four Levels of Center Designation

- Level I Functions as resource center within region
 - Level II Provide care to high volumes of trauma, stroke, and STEMI patients
 - Level III Access into system in non-metropolitan areas, more limited resources and generally refer to higher level center
 - Level IV Access in rural areas, stabilize and prepare for rapid transfer to higher level of care
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Trauma

- ▶ Have updated existing regulations
 - Adult
 - Pediatric
- ▶ Adding new center designation
 - Level IV
- ▶ Greater Alignment with Green Book through consensus process
 - Though no volume criteria
 - Will move to a 3 year review cycle
- ▶ Currently in Internal Review Process

STEMI

Level I	Level II
Require cardiac catheterization laboratory	
■ At least 400 Elective PCIs/year recommended	■ At least 200 Elective PCIs/year recommended
■ At least 49 Primary PCIs/year recommended	■ At least 36 Primary PCIs/yr recommended
■ On-site cardiac surgical services	■ On-site cardiac surgical services or expedited transfer agreement/ process ■ Alternate Pathway

STEMI

Level I	Level II
Interventional Cardiologist	
Cardiac/thoracic surgeon	Cardiac/thoracic surgeon or agreement for expedited surgery
Conduct research	Not required

STEMI

Level III	Level IV
Lytic Center some PCI capability	“Drip and Ship”
Internal Medicine	Emergency Department Physician
Emergency Department Physician	

Stroke

Level I	Level II
<p>Align with BAC and Comprehensive Stroke Center standards</p> <ul style="list-style-type: none">•Includes recommendation for recent recommendations for volume of cases and procedures	<ul style="list-style-type: none">•Align with BAC and Primary Stroke Center standards
<ul style="list-style-type: none">•On-site neurosurgery	<ul style="list-style-type: none">•On-site or expedited transfer agreement to perform neurosurgery
<p>Specialties: Neuro-interventionalist, emergency medicine</p>	<ul style="list-style-type: none">•Neuro-inter. not required•Emergency medicine
<ul style="list-style-type: none">•Conduct Research	<ul style="list-style-type: none">•Not required

Stroke

Level III	Level IV
“Drip and Ship”	Rapid Entry into the System
Internal Medicine	Emergency Department Physician
Emergency Department Physician	
Diagnostic Radiology	


Work Groups



Rural and Urban System Coordination Work Group

- ❑ **Work Group:**
 - ❑ Rural and Critical Access partners
 - ❑ Urban partners
 - ❑ Pre-hospital and Hospital partners
- ❑ **Discuss:**
 - ❑ Shared Processes
 - ❑ Rural/Urban Coordination
- ❑ **Develop Shared Recommendations**

Workgroup Goals

- ❑ Develop Rural/Urban understanding, collaboration, and coordination
 - ❑ Develop recommendations for Trauma, Stroke and STEMI process in rural areas
 - ❑ Pre-hospital
 - ❑ Hospital
 - ❑ Develop recommendations for coordination of interaction between rural and urban hospitals
 - ❑ Develop recommendations for coordination of interaction between rural/urban pre-hospital
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911 Coordination System Work Group

Work Group:

- 911 Partners
- Pre-hospital EMS Partners
- Hospital EMS Partners

Discuss:

- Shared Processes
- TCD System Coordination


Develop Shared Recommendations



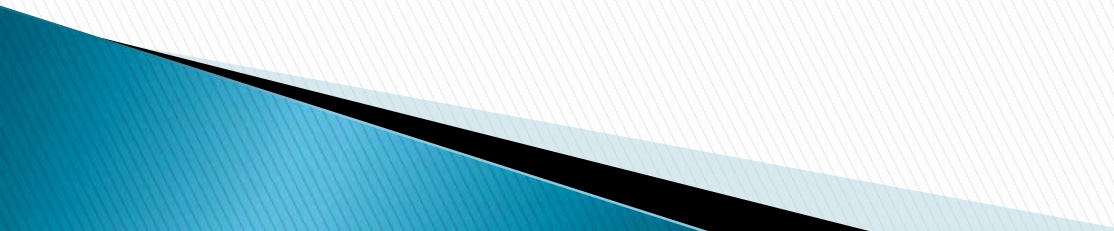
Workgroup Goals

- ▶ An understanding of system operations, requirements, demands, and constraints for 911/PSAP partners
- ▶ An understanding of how the 9-1-1/PSAP's, pre-hospital EMS, and hospital EMS can build on existing coordination, collaboration, and integration with one another
- ▶ Consensus and recommendations around PAI and EMD for TCD patients
- ▶ Identification of key data elements for 9-1-1/PSAP for inclusion in the TCD registry
- ▶ Identification and/or development of key education messages and resources for 9-1-1/PSAP's for trauma, stroke, and STEMI patients

Workgroup Goals

- ▶ Identification of resource gaps and needs for time critical patient processes
 - ▶ Recommendations for dispatch, time window goals, and options to strive towards meeting those goals as identified in state or community plan for time critical patients
 - ▶ Identification of potentially shared resources, for example, educational resources
 - ▶ Recommendations for incorporating 9-1-1 / PSAP's into quality assurance functions that should be done on local, regional, and state level
 - ▶ Recommendations for specific training and supports
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Additional Work Groups to Date

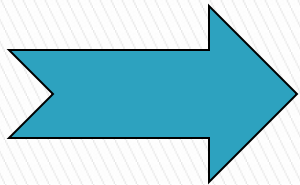
- ▶ Public Education
 - ▶ Professional Education
 - ▶ Quality Assurance
 - ▶ Trauma/Stroke/STEMI Task Force Resources and Recommendation group
- 

Next Steps



Missouri Regulations

1. Law authorizes DHSS to promulgate regulations
2. Inclusive process for drafting regulations
3. DHSS submits as “Proposed Rules”
 - Missouri Secretary of State’s Office and
 - Joint Committee on Administrative Rules
4. Public Comment Period
5. Final Rules



Phases of Development

- ▶ **Phase I (complete)**
 - start-up
 - stakeholder engagement
 - stroke/STEMI recommendations
 - trauma system gap analysis
 - legislation passage

Phases of Development

- ▶ **Phase II–Development and Initial Implementation of system components (currently wrapping up)**
 - Public Education
 - Professional Education
 - 9–1–1 Integration and recommendations
 - Rural–Urban Coordination and recommendations
 - Pre–hospital standards and recommendations
 - Hospital standards and recommendations
 - QA/PI recommendations and registry development, including trauma enhancements

Phases of Development

▶ Phase III

- Continued Implementation (hosp. designation, local–regional planning, etc)
- surveillance and refinement
- review and updating of developed resources
- day–to–day running

Phases of Development: Phase III

- ▶ Additional System work includes
 - Phase III of public education and prevention (phase I deployed; phase II in process to be launched)
 - Continued Professional education
 - 9-1-1 pilot program
 - Coordination with rehabilitation centers
 - Local and Regional approaches to rural-urban coordination
 - Telemedicine uses for trauma, stroke, and STEMI
 - Exploration of cooling centers, sepsis processes
 - System Surveillance/data analysis and reporting

Phases of Development

- ▶ Transitions
 - MFH to DHSS
 - EMS Medical Director

The End Goal:

360/365 Emergency Medical Care System

Time Critical Diagnosis–

Right care. Right Place. Right Time

Trauma

Stroke

STEMI

Better outcomes for Missourians

Questions?

Thank You

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