



# **Beyond Response Times: Structuring Systems for the Future**

Presented by Doug Wolfberg, Esq.



# Overview

- Why EMS Response Times?
- The Fallacy of EMS Response Times
- Response Time Reforms
- EMS System Design & Sustainability
- Health Equity in EMS System Design

# **Why are EMS Response Times the Primary Measurement of System Performance?**

# The biggest reason:

“because we’ve always done it this way.”

“  
The most dangerous phrase  
in the language is ‘we’ve always  
done it this way.’

- Grace Hopper



# The Second Biggest Reason...

- Response times are easy to measure...
- ...and, they are widely perceived as a proxy for EMS system quality



**Speed**  **Quality**

# Other Reasons

- Public perception
  - Citizens *believe* speed matters
  - Many in our profession perpetuate this myth
- Political accountability
  - Local elected officials equate response time with contractor performance
- Customer service
  - Meeting customer demand for prompt service

**Doug's  
Imagination  
Exercise #1**



**IMAGINE**



**Imagine for just a moment how public perceptions of EMS would change, *if...***



**Instead of responding with  
“public safety personnel” in  
“emergency vehicles” with  
lights and sirens...**



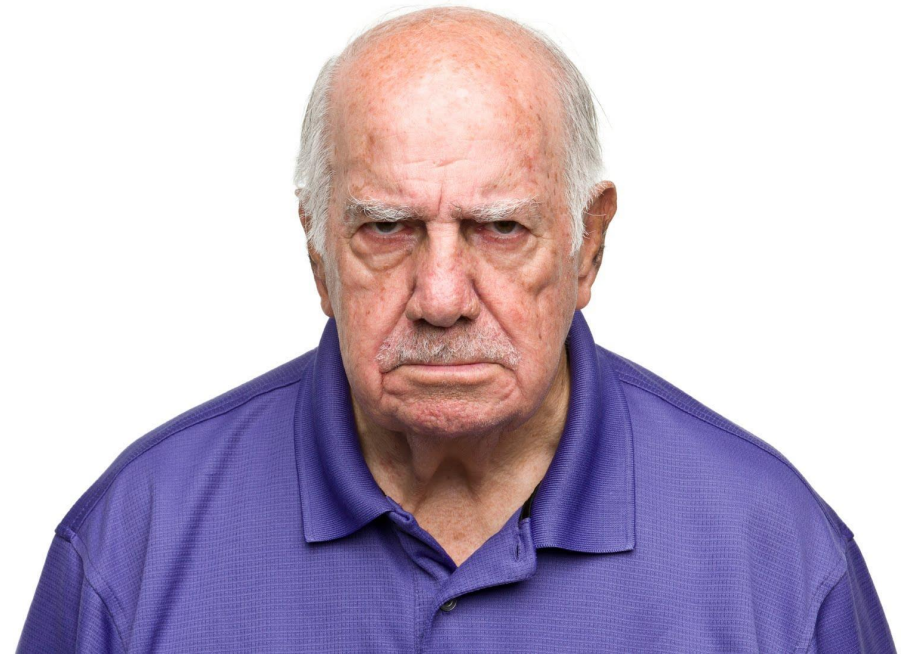
# We showed up looking like the *healthcare providers* we are...







**It took you 15  
minutes to get  
here, *what took  
you so long?***



**A *doctor* showed  
up at my door,  
and it only took  
45 minutes!**



# The Fallacy of EMS Response Times

# EMS Response Times

- Data clearly show that response times do not affect positive outcomes for the overwhelming majority of EMS calls
  - Response time compliance requires sufficient deployment of unit hours
  - Unit hours are the single most expensive component of an EMS system

# EMS Response Times

- The vast majority of conditions for which EMS is dispatched do not have a demonstrated correlation between response times and patient outcomes



**This does *not*  
mean that time  
doesn't  
matter...**



**It just means  
that the *EMS*  
*response time*  
isn't what  
*usually* matters**



# Where Time Matters

## Clinical Conditions

- Cardiac arrest
- STEMI
- Stroke
- Penetrating Trauma

# Where Time Matters

## Clinical Conditions

- Cardiac arrest
- STEMI
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## Other Determinative Factors

- Bystander CPR/defib
- Time to STEMI center
- Time to stroke center
- Time to trauma center

**EMS response times have a  
role in determining  
outcomes for some of these  
conditions, but not the role**

# Response Time Consequences

- High deployment costs to meet RT standards
- EMS clinician fatigue and burnout
- Excessive RLS use
- Ambulance crashes

# Let's Illustrate this Fallacy

# Example 1

- Patient suffers chest pain
- Calls 911
- PSAP dispatches an ALS ambulance
- Crew arrives on scene in 8 minutes
- But, fails to properly detect a STEMI
- Transports pt to community hospital ED



## Example 1 (cont'd)

- After offload delay and initial exam and EKG, local ED detects the STEMI
- Arranges for transport to STEMI center
- Pt taken to cath lab 94 minutes after initial 911 call

## Example 2

- Patient suffers chest pain
- Calls 911
- PSAP dispatches an ALS ambulance
- Crew arrives on scene in 18 minutes
- Applies 12 lead EKG and calls STEMI alert
- Transports pt to accredited STEMI center

## Example 2 (cont'd)

- Pt arrives at STEMI center 12 minutes later
- Pt is taken directly to the cath lab
- Total elapsed time is 34 minutes from time of 911 call to PCI (percutaneous coronary intervention)

**Which patient is statistically  
likely to have a better  
outcome?**

The patient with the 18-minute  
EMS response time

## Methods and Results

We analyzed 5243 patients with ST-segment–elevation myocardial infarction were treated at 20 tertiary hospitals capable of primary percutaneous coronary intervention in Korea. The association between O2D or D2B time with all-cause mortality at 1 year was evaluated. The median O2D time was 2.0 hours, and the median D2B time was 59 minutes. A total of 92.2% of the total population showed D2B time  $\leq 90$  minutes. In univariable analysis, 1-hour delay of D2B time was associated with a 55% increased 1-year mortality, whereas 1-hour delay of O2D time was associated with a 4% increased 1-year mortality. In multivariable analysis, D2B time showed an independent association with mortality (adjusted hazard ratio, 1.90; 95% CI, 1.51–2.39;  $P < 0.001$ ). Reducing D2B time within 45 minutes showed further decreased risk of mortality compared with D2B time  $> 90$  minutes (adjusted hazard ratio, 0.30; 95% CI, 0.19–0.42;  $P < 0.001$ ). Every reduction of D2B time by 30 minutes showed continuous reduction of 1-year mortality (90 to 60 minutes: absolute risk reduction, 2.4%; number needed to treat, 41.9; 60 to 30 minutes: absolute risk reduction, 2.0%; number needed to treat, 49.2).

# Response Time Reforms

# Stakeholder Education

- The political reality:
  - Leaders cannot instantly pivot their EMS systems from RT-centric to non-RT-centric
  - EMS system redesign must go hand in hand with stakeholder education

# Stakeholder Education

- EMS system leaders must consistently reinforce accurate messaging with local officials, citizens, healthcare leaders and others
- May be more “evolutionary” than “revolutionary”



# Liquidated Damages Reforms

- RT performance penalties should not be the primary economic driver of EMS system contracts
- RT performance penalties do not incentivize good care
- RT penalties increase pressure on EMS system sustainability

# Liquidated Damages Reforms

- Shouldn't our economic disincentives be focused on preventing poor care instead of promoting fast responses?

# Alternative Liquidated Damages

- “Never Events”
- Penalty “per occurrence”
- Examples:
  - Failure to identify STEMI/stroke patients and transport to accredited specialty centers
  - Medication administration or device errors with potential to cause serious harm or death

# Liquidated Damages Reforms

- Clinical Performance Standards
- Penalties for performance below established parameters
- Example:
  - Perform 12-lead EKG within 10 minutes for CC of chest pain/cardiac symptoms 92% of the time

# RT Measurement Reforms

- Start by separating the conditions for which there is a RT clinical correlations from the conditions that do not have a demonstrated relationship to improved outcomes

# Clinical vs. Non-Clinical RTs

## Clinical RTs

- Where RTs have a *clinical* correlation, they should be *clinical* performance standards

## Non-Clinical RTs

- All other response times are essentially related to *patient/public satisfaction*

# Other Approaches

- Incentives and disincentives should all point toward excellence in *clinical performance*
- For example, superior performance on clinical performance measures can offset/reduce RT penalties

**EMS**  
**is**  
**Healthcare**

**THIS**  
**JUST IN**



# EMS System Design and Sustainability

# EMS System Design

- The single biggest driver of sustainability is the EMS system's design
- This often lives at the intersection of public policy, politics, tradition and science

# Compare...

- An EMS system with an ALS ambulance and critical care practitioner every square mile would be ***highly desirable*** but ***utterly unaffordable***

# Compare...

- An EMS system with an ALS ambulance and critical care practitioner every square mile would be *highly desirable* but *utterly unaffordable*
- An EMS system with one BLS ambulance for every 250,000 people would be ***highly affordable*** but ***utterly undesirable***

# “EMS sustainability” strives to find that happy medium



**Doug's  
Imagination  
Exercise #2**



**IMAGINE**

# Patient:

*“Hi. I think I’d like some narcotic analgesics, a few benzodiazepines and some propofol.”*



# Pharmacist:

*“Excuse me, what?”*





**If you find this scenario preposterous, then why is hard to envision a system where EMS clinicians (per medical direction) determine which patients require EMS intervention and transport, and which don't?**



# Five Sustainability Questions

- Should everyone who calls for EMS get an EMS response?
- Should all EMS responses require ALS?
- Should everyone we assess get EMS care?
- Should everyone who wants it receive an EMS transport?
- Should every transport destination be an acute care hospital?

***“But Doug, I’m worried about our liability if we don’t respond to every 911 call with an EMS response and transport everyone who wants it.”***

# Doug Sez:

*Where do EMS standards of care say that we must provide interventions to people who don't need them?*

## Doug Sez:

*I'm worried about your liability if people with true emergencies are waiting for extended periods of time for response, transport and hospital care because our systems are overburdened with low-acuity calls.*

# Dispatch Clinical Decision Making

- Robust EMD and no-send protocols can safely determine which 911 EMS calls do not require a full EMS response
  - Community paramedicine
  - Primary care
  - Limited/non-transport EMS response

# ALS Deployment

- Less than 10% of all 911 calls require an ALS intervention
- Yet, some systems deploy 100% ALS as a political accommodation or contractual requirement
- More difficult to sustain the expense associated with this model of deployment

# EMS Interventions

- Assess without treatment
- Treatment in place
- Telehealth



# Transport and Destination Decision Making

- EMS non-transport determinations
- Transport to alternative destinations
  - More appropriate care?
  - More cost-effective care?
  - Avoidance of prolonged APOT in crowded Eds
  - These strategies can help maintain readiness for true emergencies in the community

# Transport and Destination Decision Making

- Transport to acute care hospital ED
  - Statistically, this should probably be the exception and not the norm

# Transport-Based Reimbursement

- Patient transport is only *one component* of what most EMS systems do
  - Treat/no transport
  - Patient refusals
  - Cancellations
  - No patient found
  - First response

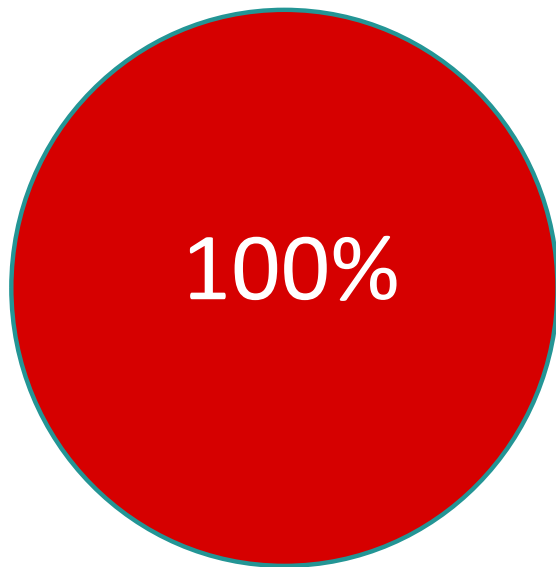
# Transport-Based Reimbursement

- To make matters more challenging, only a *subset* of transports are even eligible for reimbursement
  - Non-medically necessary transports
  - Uninsured patient transports
  - Transports paid then later recouped by the insurer

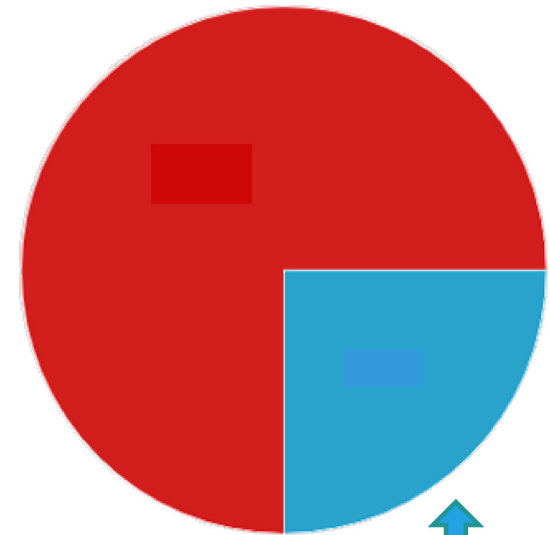
# Transport-Based Reimbursement

- In other words, EMS agencies must recover the costs from the wide array of services they provide from just a *subset* of *one line* of service

**This is What  
You Do:**



**...but...**



**This is What You  
Get Paid For**

# Economic Models

- We don't have to wait for Medicare to get the memo that reimbursement for non-transport EMS modalities makes good clinical and economic sense

# Economic Models

- EMS systems can:
  - Partner with payers to establish payer coverage agreements for non-transport services
  - Partner with facilities, clinics and others for alternative destination transport acceptance agreements



# Economic Models

- In some systems *cost avoidance* alone would enhance system sustainability
  - Extended APOT
  - Overtime
  - Non-coverage for uncompensated care and non-medically necessary transports

# Health Equity in EMS System Design

# Examples of What Studies Show

- Disparities in prehospital pain management by race
- Disparities in cardiac arrest care by income
- Disparities in EMS stroke recognition by race

# Health Equity Metrics

- EMS systems should assess disparities in care as part of routine QI program function
- Important to look at clinical performance overall, but also vital to compare clinical performance in vulnerable populations
  - Disparities can be disincentivized via liquidated damages or equity outcomes can be incentivized through credits to offset other penalties

# Workforce Diversity

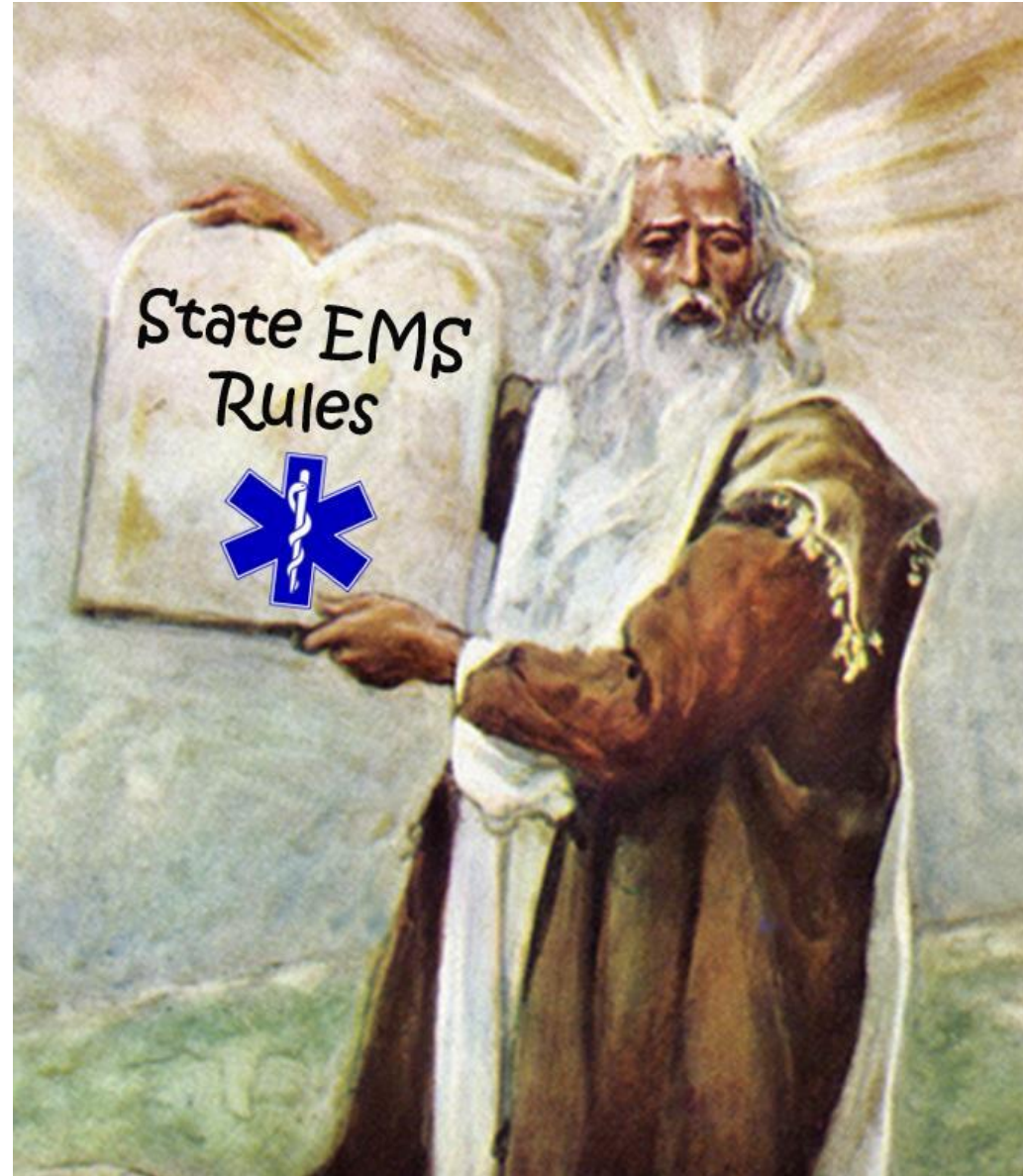
- Studies link greater health equity measures to healthcare workforce that is more reflective of populations served
- Systems should prioritize recruitment, education and retention of clinicians from communities served

# Implicit/Unconscious Bias

- Requires a multi-faceted approach that should be fostered and supported by EMS leaders
- Scenario-based training and education
- Self-awareness
- QA/QI integration
- Monitoring and measuring critical performance metrics

# Concluding Thoughts

**EMS has always followed the “Stone Tablet Model”**





# Past is Not Always Prologue...

- In the first generations of EMS systems, strong and prescriptive centralized control was a necessity
  - Relative lack of EMS-trained physicians for medical oversight
  - Less evidence-based practice

# Now...

- Flexibility and innovation are keys
  - Allow for ability to meet varying local needs
  - Allow for adaptive rather than fixed scope of practice
  - Facilitate collaboration with other health disciplines
  - Embrace alternative service models

# Questions and Discussion



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