To FLY or to DRIVE?

Helicopter Transport of Trauma Patients

Jeffrey Lubin, MD, MPH
Division Chief, Transport Medicine
Penn State Hershey Medical Center
Life Lion EMS and Critical Care Transport
Hershey, PA

University Hospitals
Case Medical Center

To FLY or to DRIVE:
Helicopter Transport of Trauma Patients

Jeffrey Lubin, MD, MPH
Director, EMS and Critical Care Transport
University Hospitals Case Medical Center
Cleveland, OH

Matthew and the Terrible, Horrible, No Good, Very Bad Day


STOP


PENNSTATE HERSHEY
Life Lion

Questions that may be going through your head:

- Will this patient need to go to a trauma center?
- Does it need to be a pediatric trauma center?

The short answer…

ORC §4765.40 requires that EMS providers transport trauma patients directly to an adult or pediatric trauma center that is qualified to provide appropriate adult or pediatric trauma care, unless one or more of five specific exceptions occur.

The short answer…

ORC § 4765.01 defined “pediatric" as involving a patient who is less than ***sixteen*** years of age.

Do trauma centers make a difference ?

Yes… trauma patients cared for at designated trauma centers have a lower risk of death

MacKenzie E.J., Rivara F.P., Jurkovich G.J., et al: A national evaluation of the effect of trauma-center care on mortality. *N Engl J Med* 354. 366-378.2006.

Demetriades D., Martin M., Salim A., et al: Relationship between American College of Surgeons trauma center designation and mortality in patients with severe trauma (Injury Severity Score >15). *J Am Coll Surg* 202. 212-215.2006.

Demetriades D., Martin M., Salim A., et al: The effect of trauma center designation and trauma volume on outcome in specific severe injuries. *Ann Surg* 242. 512-517.2005.

Why are *pediatric* trauma centers unique?

PENNSTATE HERSHEY
Milton S. Hershey Medical Center
1855

Good People. Great Medicine.™
PennStateHershey.org

- Come in different ages and sizes
- Different physiologic and psychological responses to injury
- Dosing can be different in children than in adults

And does that *really* matter?

Pediatric trauma mortality is improved in a pediatric trauma center or in an adult center with pediatric trauma certification

Key factors:

- Certification in pediatric trauma
- Experience in the delivery of trauma care

The American Journal of Surgery (2011) 201, 445–449

Treatment outcomes of injured children at adult level 1 trauma centers: are there benefits from added specialized care?

Tolulope A. Oyetunji, M.D., M.P.H.[a,*], Adil H. Haider, M.D., M.P.H., F.A.C.S.[b], Stephanie R. Downing, M.D.[a], Oluwaseyi B. Bolorunduro, M.D., M.P.H.[a], David T. Efron, M.D., F.A.C.S.[b], Elliott R. Haut, M.D., F.A.C.S.[b], David C. Chang, M.P.H., M.B.A., Ph.D.[d], Edward E. Cornwell III, M.D., F.A.C.S.[a], Fizan Abdullah, M.D., Ph.D., F.A.C.S.[c], Suryanarayana M. Siram, M.D., F.A.C.S.[a]

53,702 children included, with overall mortality of 3.9%
Adjusted odds of mortality was 20% LOWER at ATC-AQ.

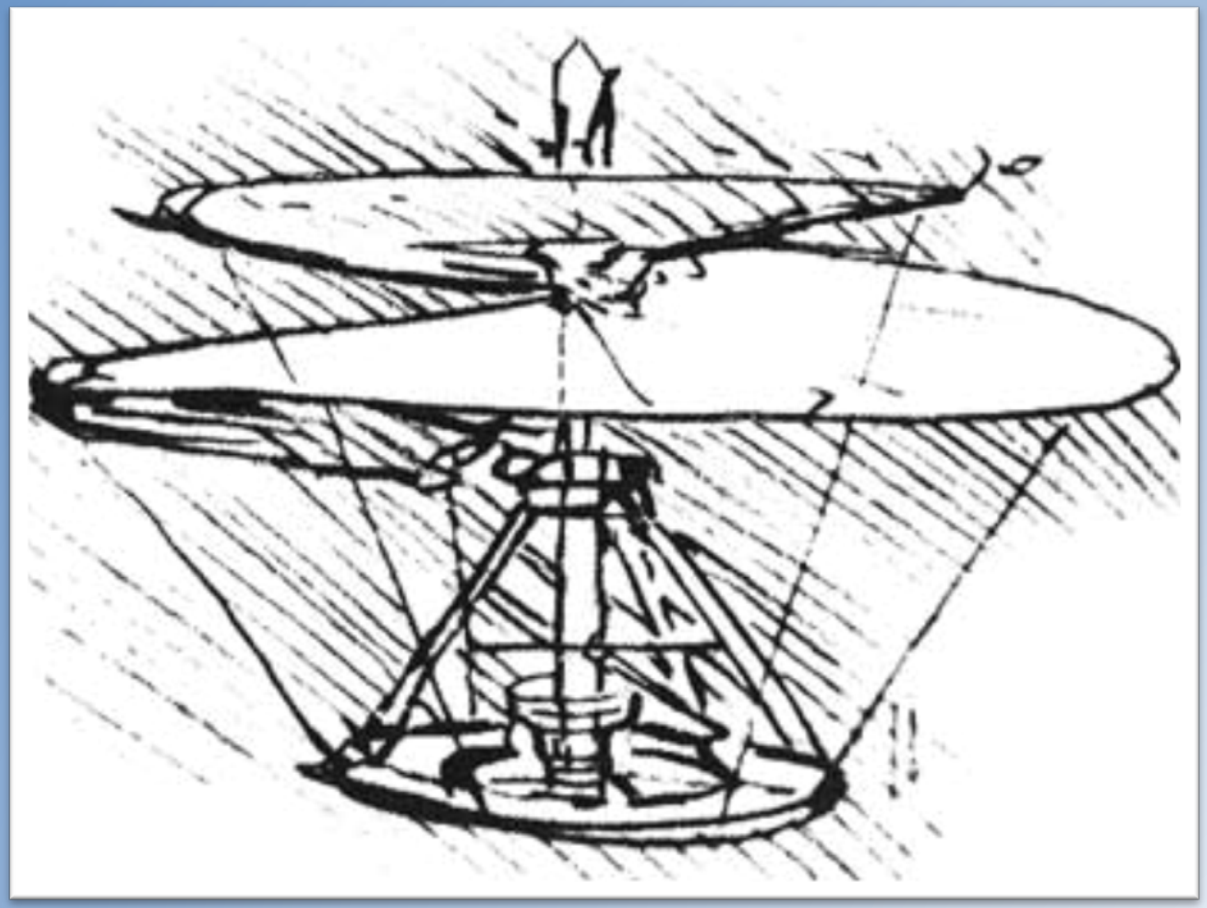

N896LL
Life Lion


4-K

OBJECTIVES

- Discuss importance of trauma centers and, in particular, pediatric trauma centers in emergency care
- Review the capabilities, risks, and limitations of HEMS
- Analyze medical literature involving patient outcomes in trauma patients transported by helicopter
- Create a strategy for EMS providers for when to activate HEMS to the scene, rendezvous at an alternative location, or drive to a trauma center

“A helicopter is an assembly of forty thousand loose pieces, flying more or less in formation"



First “practical” helicopter

"If you are in trouble anywhere in the world, an airplane can fly over and drop flowers… but a helicopter can land and save your life."

First true use of air ambulances began in the Korean War when many battlefield causalities were transported by Army Bell 47s to MASH units

Before Rapid Transport

World War I (1914-1918)

- Average time from injury to care was 12-18 hrs
- Death rate: 8.5%

Helicopters Introduced

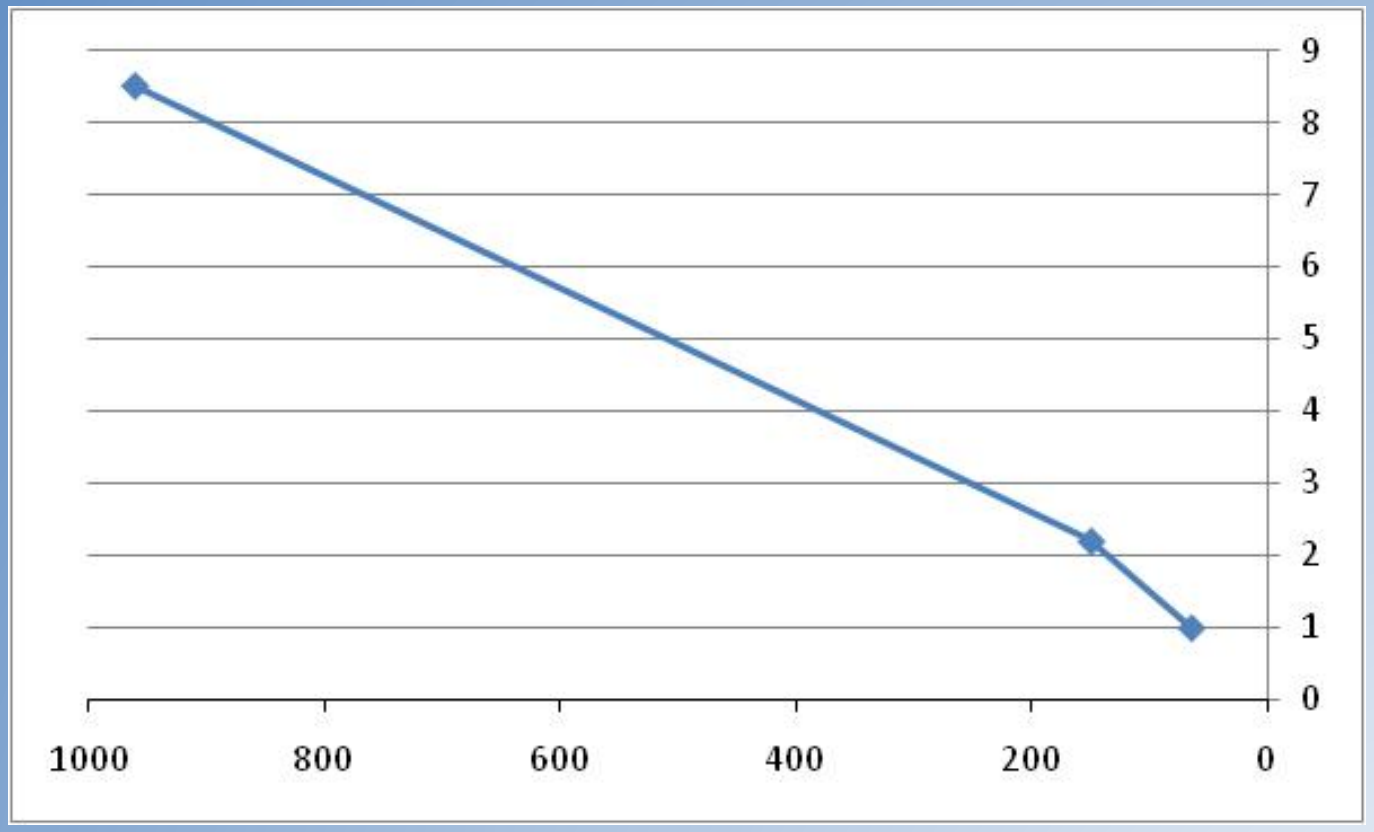
Korean War (1950-1953)

- Introduction of helicopters to transport injured
- Average time from injury to care was 2-3 hrs
- Death rate: 2.2%

Air Transport Becoming Routine

Vietnam War (1965-1973)

- Average time from injury to care was 65 min
- Death rate: 1%



Civilian Adaptation: 1966

- Publication of *Accidental Death and Disability: The Neglected Disease of Modern Society*
- The National Highway Safety Act establishes Department of Transportation, which provided EMS grants for EMS

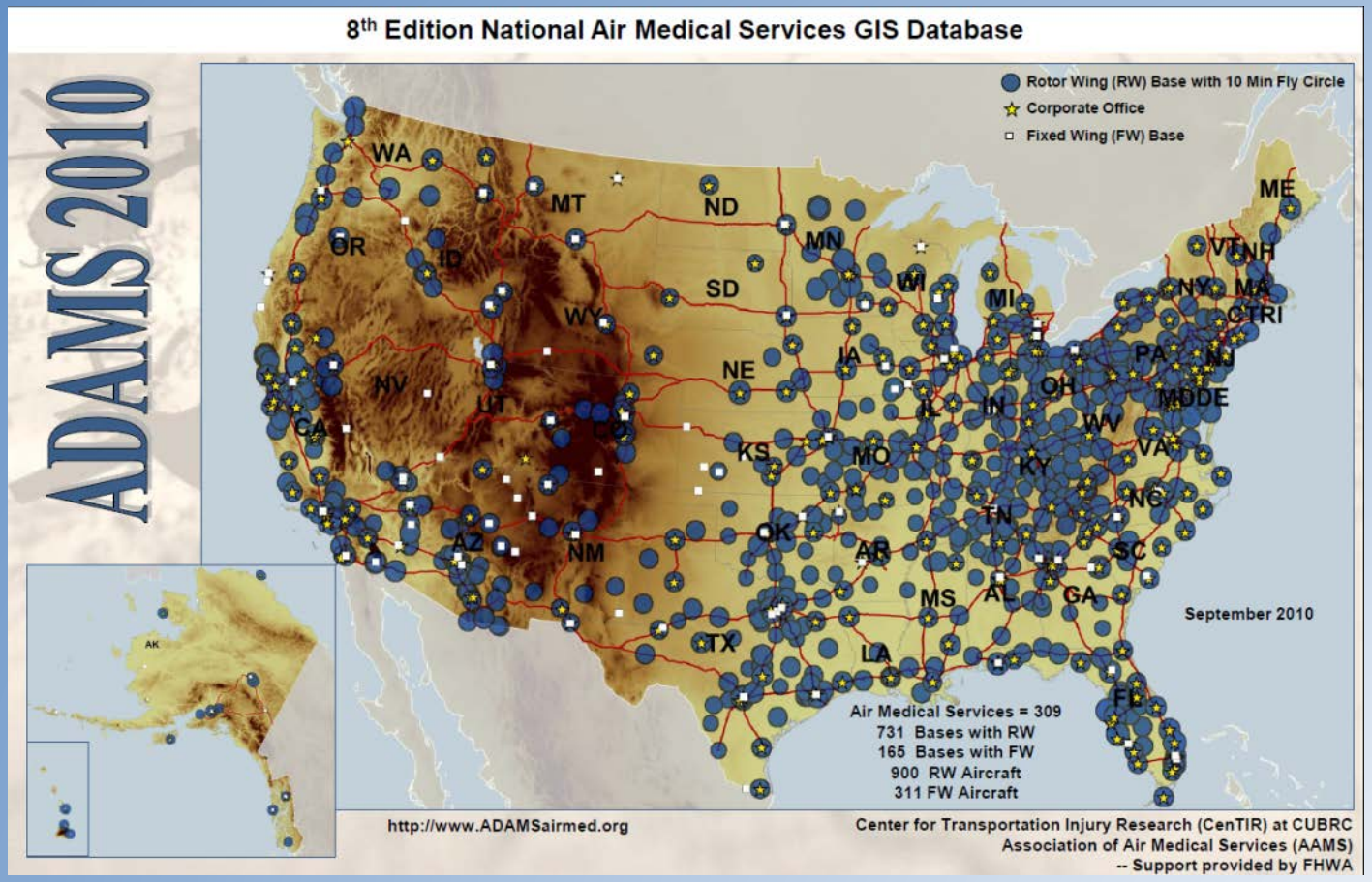

ACCIDENTAL DEATH AND DISABILITY:
THE NEGLECTED DISEASE
OF MODERN SOCIETY

Prepared by the
COMMITTEE ON TRAUMA AND COMMITTEE ON SHOCK
DIVISION OF MEDICAL SCIENCES
NATIONAL ACADEMY OF SCIENCES
NATIONAL RESEARCH COUNCIL

NATIONAL ACADEMY OF SCIENCES NATIONAL RESEARCH COUNCIL
Washington, D. C., September, 1966

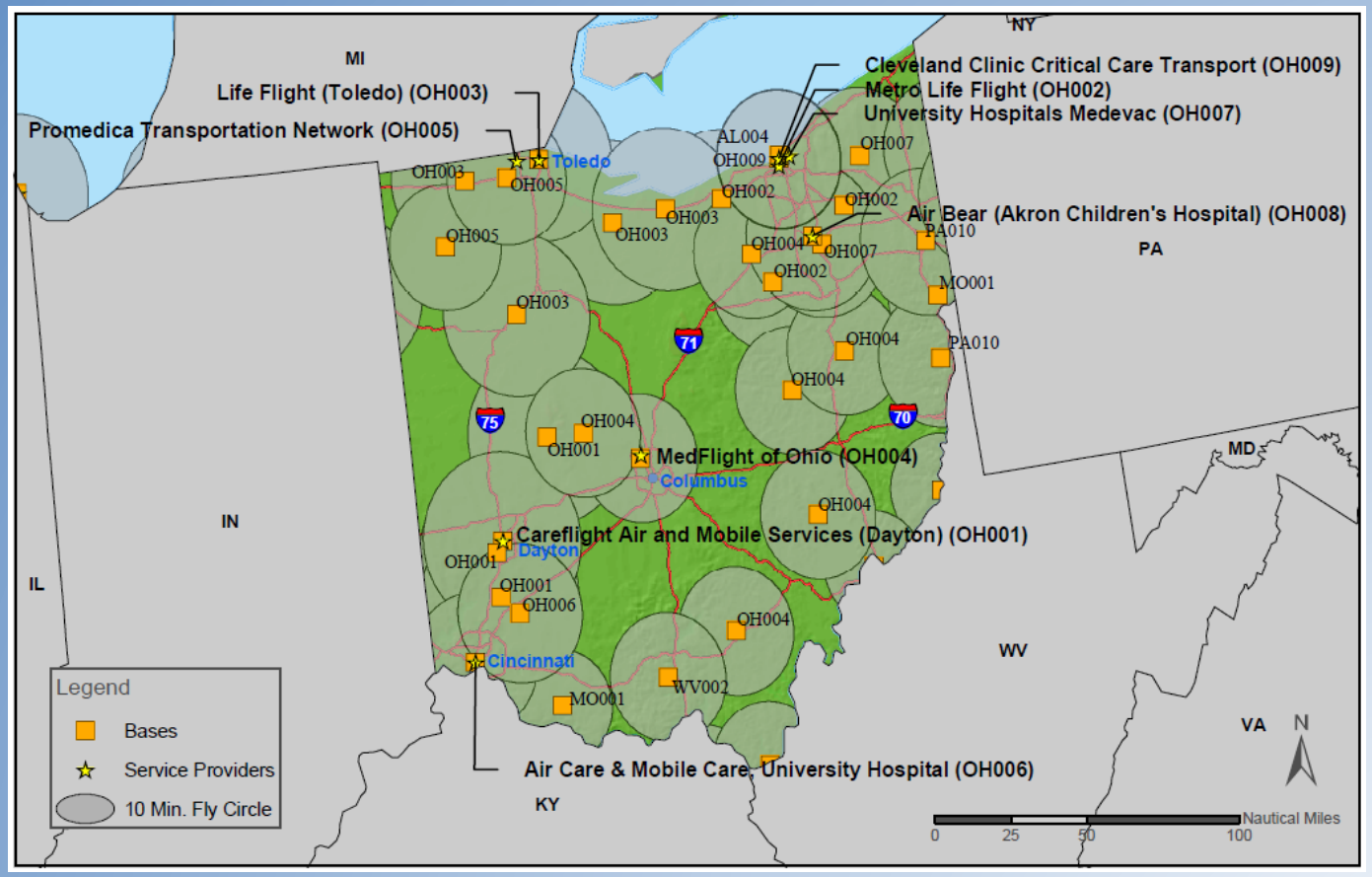
Civilian Adaptation: 1969

Where are we now?



Atlas & Database of Air Medical Services (ADAMS), http://www.adamsairmed.org/

In Ohio…



PENNSTATE HERSHEY
Milton S. Hershey Medical Center
1855

Good People. Great Medicine.™
PennStateHershey.org

Three **PRIMARY** Advantages of Air Medical Transport

Three **PRIMARY** Advantages of Air Medical Transport

PENNSTATE HERSHEY
Milton S. Hershey Medical Center
1855

Good People. Great Medicine.™
PennStateHershey.org

Three **PRIMARY** Advantages of Air Medical Transport

PENNSTATE HERSHEY
Milton S. Hershey Medical Center
1855

Good People. Great Medicine.™
PennStateHershey.org

Three **PRIMARY** Advantages of Air Medical Transport

PENNSTATE HERSHEY
Milton S. Hershey Medical Center
1855

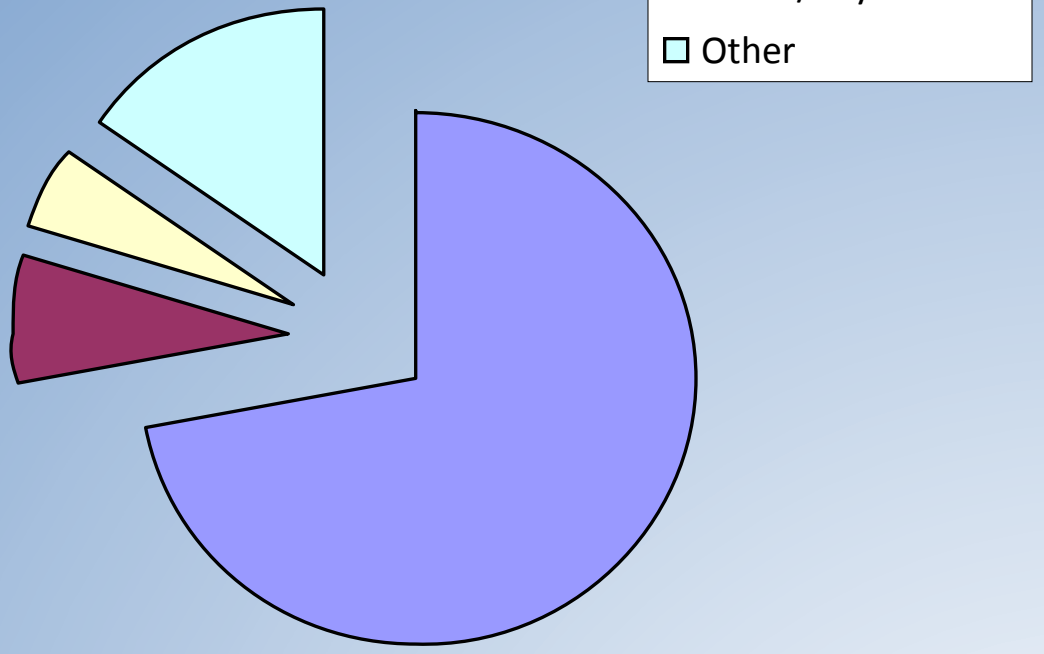
Good People. Great Medicine.™
PennStateHershey.org

Three **PRIMARY** Advantages of Air Medical Transport

1. Speed
2. Ability to overcome terrain/obstacles
3. Specialty teams

Typical team configurations:

- RN/Paramedic
- RN/RN
- RN/Physician
- Other



Having a team with diverse strengths allows for the efficient management of a wide variety of patients

Typical HEMS Skill Set

- Administration of blood and blood products
- Administration of medication using pumps
- Advanced airway management, including the use of paralytics and surgical airways
- Monitoring of invasive vascular devices
- Ventilator management

Other Possible Skills

- Continuous fetal monitoring
- Initiation of central venous access
- Internal cardiac pacing
- Place of chest tubes
- Use of intra-aortic balloon pump
- Use of in-flight lab testing
- Use of neonatal isolette

LIMITATIONS

- Space/weight restrictions

LIMITATIONS

- Weather

VISUAL FLIGHT RULES (VFR)

LIMITATIONS

- Weather

INSTRUMENT METEOROLOGIC CONDITIONS (IMC)

LIMITATIONS

- Weather

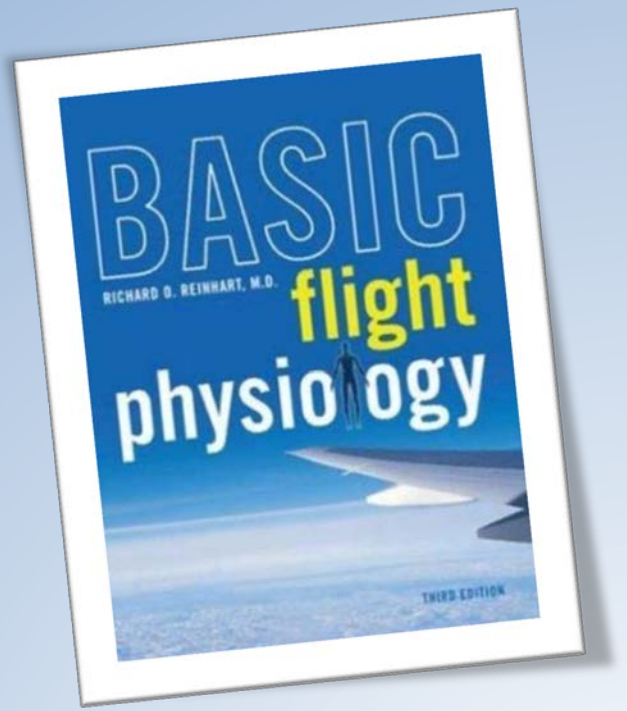
CANNOT FLY

LIMITATIONS

- Noise

LIMITATIONS

- Flight Physiology
  - Effects of pressure changes
  - Stressors of flight
    - Thermal considerations
    - Vibration
    - Gravitational Forces
    - Motion Sickness

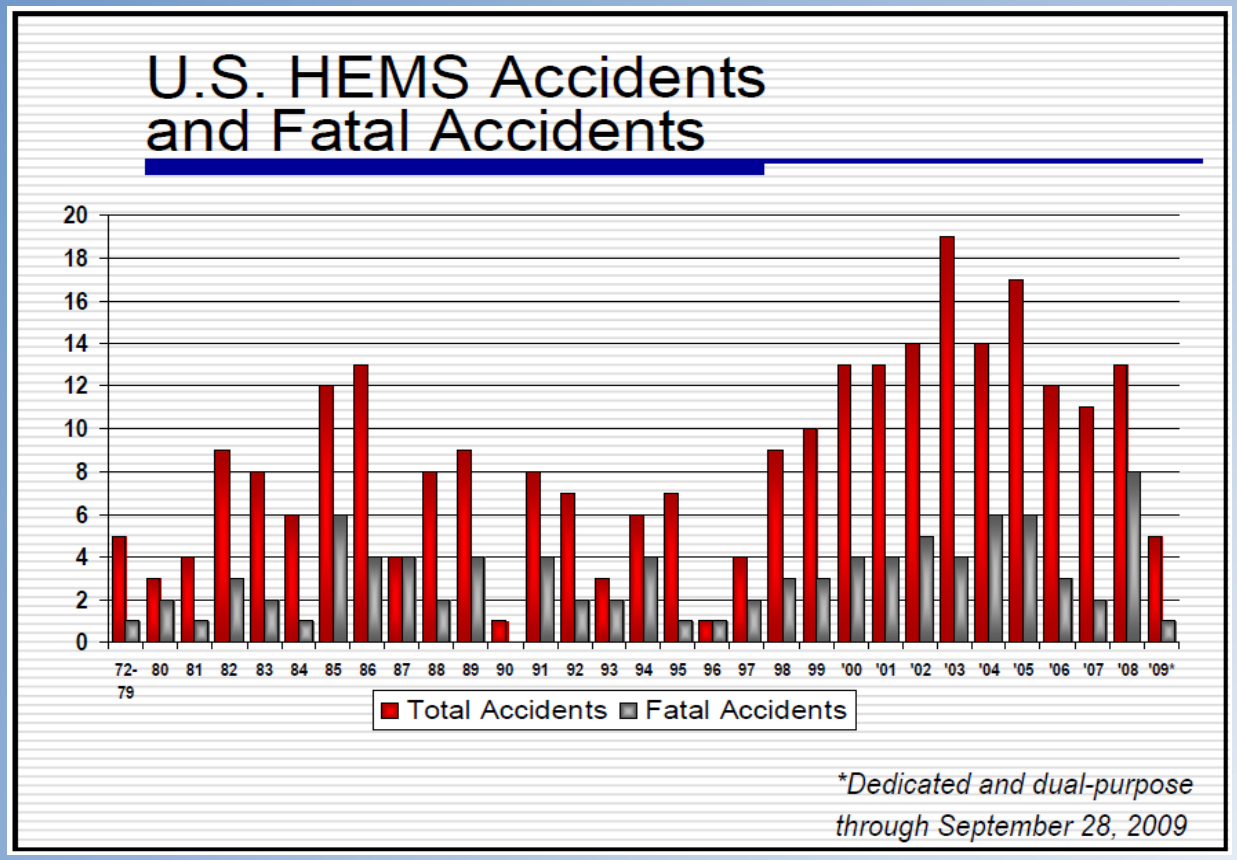


COST

- Aircraft: $2-7 million
- Aircraft maintenance
- Fuel: $4-5/gallon… approx 50-75 gallons/flight hr
- Crew salary (including mechanic)
- Bases (including hangar)
- Medical Equipment

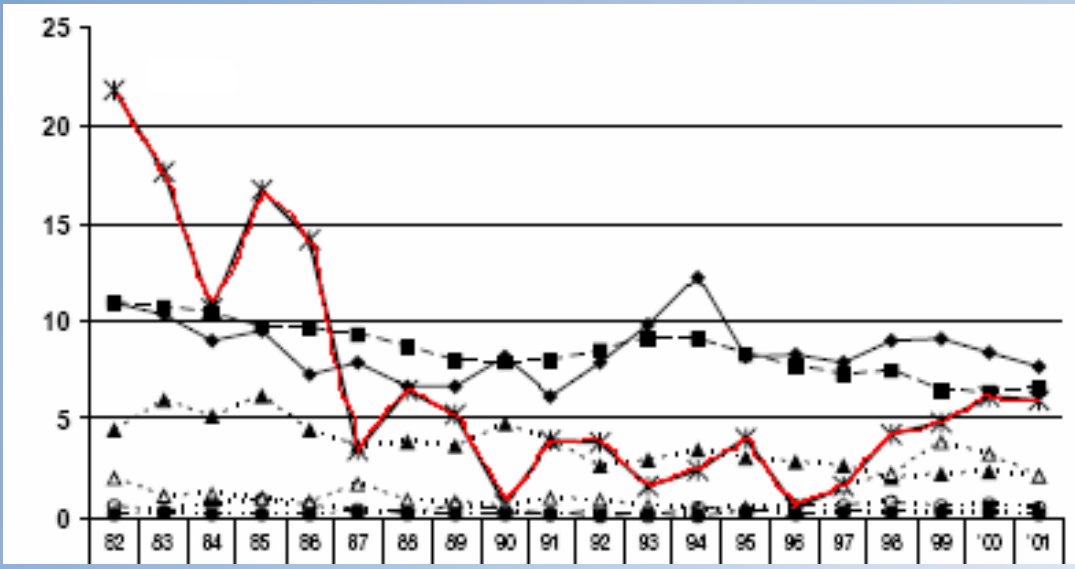
The patient charge per flight
can run from $16,000 to $40,000!

AND... ARE THEY SAFE?



SAFETY: Compared to General Aviation

- 20-year avg: below all helicopter and GA operations
- 10-year avg: less than 50% of helicopters and GA



SAFETY: Compared to Ground EMS

- 1993 Houston study:
  - Ambulances 13x more likely to get in an accident based on number of accidents per miles traveled
  - Ambulances 5x more likely to get in an accident that resulted in injuries
- 1997–1999 NSC study:
  - 0.47% of ambulance accidents resulted in a *fatal* injury
  - Average 5.2 fatal injuries per 1,000 accidents

SAFETY: Compared to Hospitalization

- Between 130-300 per 100,000 patients die each year in hospitals due to medical errors
- For air medical transport, there will be approximately 0.76-1.2 deaths per 100,000 patients flown

OK…

I understand that they have limits…

And maybe I'm willing to pay for them…

And maybe they're not too dangerous…

… but do they actually make a *DIFFERENCE*?

Original Contributions

Reduced Mortality in Injured Adults Transported by Helicopter Emergency Medical Services

Ernest E. Sullivent, MD, MPH, Mark Faul, PhD, MA, Marlena M. Wald, MPH, MLS

PREHOSPITAL EMERGENCY CARE 2011;15:295–302

OBJECTIVE.

To determine whether the mode of transport of trauma patients affects mortality

METHODS.

Data for 56,744 injured adults aged ≥18 years transported to 62 U.S. trauma centers by helicopter or ground ambulance were obtained from the National Sample Program of the 2007 National Trauma Data Bank. In-hospital mortality was calculated for different demographic and injury severity groups. Adjusted odds ratios (AOR) were produced by utilizing a logistic regression model measuring the association of mortality and type of transport, controlling for age, gender, and injury severity (Injury Severity Score [ISS] and Revised Trauma Score [RTS]).

HUH?

METHODS.

Looked at data for 56,744 injured adults

Calculated in-hospital mortality based on…

- different demographic groups
- injury severity groups

Associated MORTALITY with TYPE OF TRANSPORT, using statistics to adjust for age, gender, and injury severity

ADJUSTED ODDS RATIO:

A way of comparing whether the probability of a certain event is the same for two groups.

In statistics, the *odds* of an event occurring is the probability of the event divided by the probability of an event *not* occurring.

RESULTS.

The odds of death were 39% lower in those transported by HEMS compared with those transported by ground ambulance (AOR = 0.61).

95% CI = 0.54–0.69

Air Versus Ground Transport of the Major Trauma Patient: A Natural Experiment

Jennifer McVey, MSc, MD, David A. Petrie, MD, John M. Tallon, MSc, MD

PREHOSPITAL EMERGENCY CARE 2010;14:45–50

OBJECTIVE.

To compare the outcomes of adult trauma patients transported to a level I trauma center by helicopter vs. ground ambulance.

METHODS.

Outcomes in adult trauma patients transported to a trauma center by air were compared with a group of patients whose missions were aborted for aviation reasons (weather, maintenance, out on a mission); these patients were subsequently transported by ground ambulance instead. Outcomes were also analyzed for a third ground control group composed of all other adult trauma patients transported by ground. Outcomes were measured by Trauma Injury Severity Score (TRISS) analysis.

TRISS:

Derives the probability of survival of a patient from the ISS and RTS using a standard formula, corrected for age and whether it is blunt or penetrating trauma

RESULTS.

397 pts flown
57 pts would have flown, but had aviation-related abort

Ages
Gender distributions
Mechanisms of injury
Injury Severity Scores (ISSs)

} All similar between the two groups

RESULTS.

Per 100 patients transported, 5.61 more lives were saved in the air group vs. the aviation abort.

The 1,195 patients in the third all-other ground control group had a higher mean age, lower mean ISS, and worse outcomes according to TRISS analysis.

CONCLUSIONS.

Air transport of the adult major trauma patient is associated with significantly improved survival as compared with ground transport.

But is it the same for ***kids***?

Helicopter Transport of Pediatric versus Adult Trauma Patients

Stephen J. Kotch, MD, Brian E. Burgess, MD

PREHOSPITAL EMERGENCY CARE 2002;6:306–308

OBJECTIVE.

To determine whether injury severity and survival probability in pediatric trauma patients were similar to those for adults when helicopter transport was utilized at a suburban trauma center

METHODS.

The authors conducted a retrospective review of all trauma patients transported by helicopter from the accident scene. Patients were identified from the Christiana Care Health System trauma registry from January 1995 to November 1999. Pediatric patients were defined as those aged 15 years and younger. Data collected were utilized to determine injury severity score (ISS), revised trauma score (RTS), and survival probability.

RESULTS.

Looked at records of 969 patients:

- 826 adult (16+)
- 143 pediatric

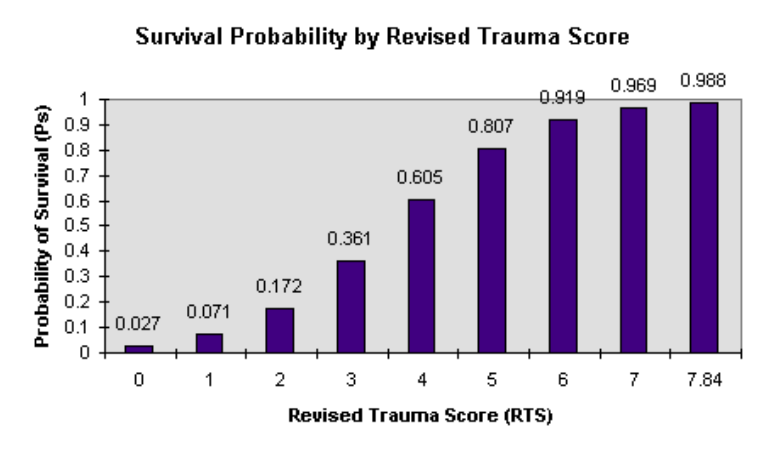
No difference noted in injury severity

INJURY SEVERITY SCORE:

An anatomical scoring system that provides an overall score for patients with multiple injuries, using scores for six body regions; the 3 most severely injured body regions have their score squared and added together to produce the ISS score

REVISED TRAUMA SCORE:

A physiological scoring system that incorporates GCS, systolic blood pressure, and respiratory rate



RESULTS.

Average length of stay less for kids (7.5 vs. 5.2 days)

Survival probabilities similar for the two groups, although met statistical significance (0.92 adult, 0.95 pediatric; p = 0.03).

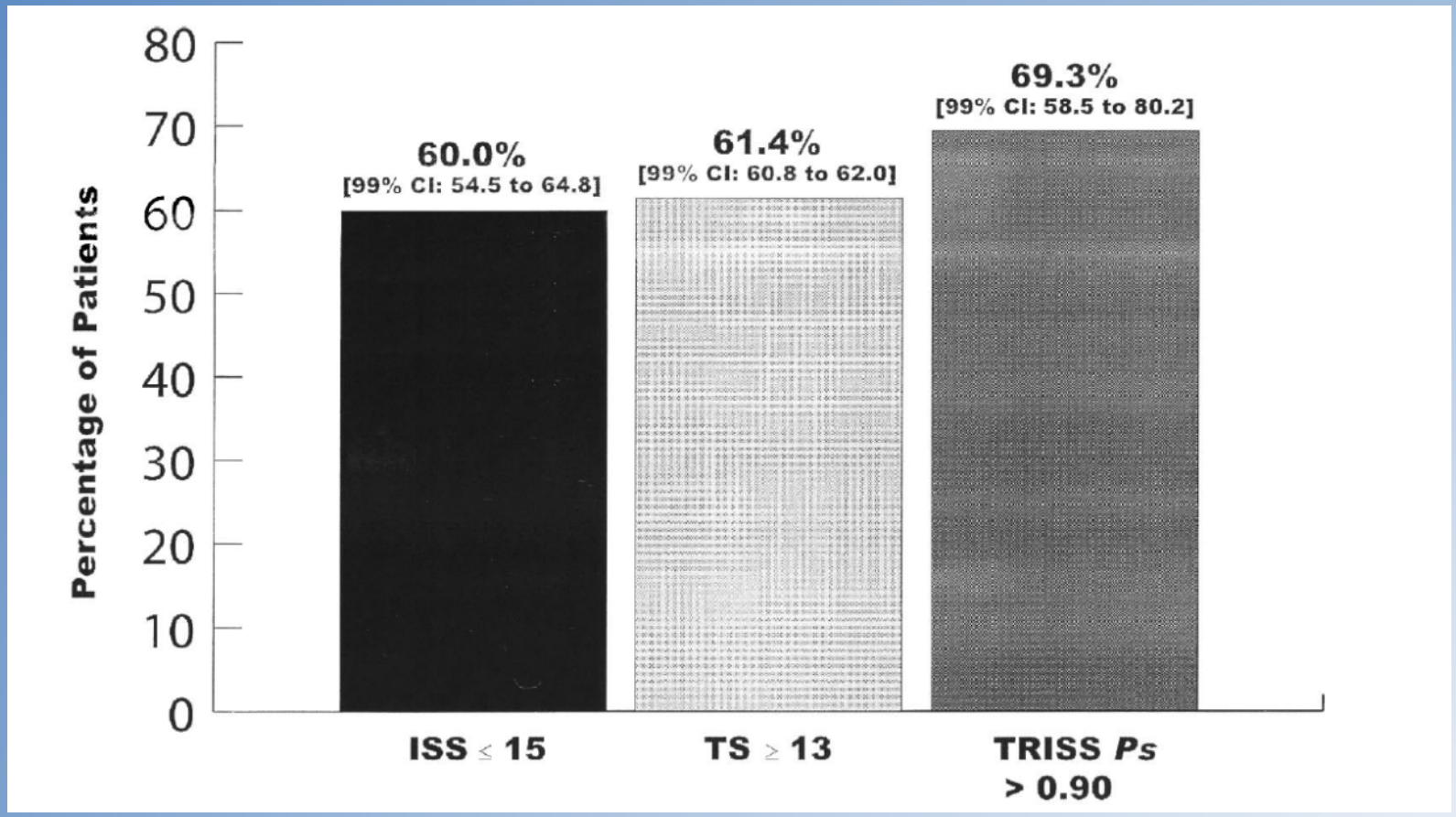
CONCLUSIONS.

Pediatric patients transported from the accident scene by helicopter have similar ISSs and RTSs compared with adults. These data suggest that prehospital selection criteria for the two groups are similar.

Helicopter Scene Transport of Trauma Patients with Nonlife-Threatening Injuries: A Meta-Analysis

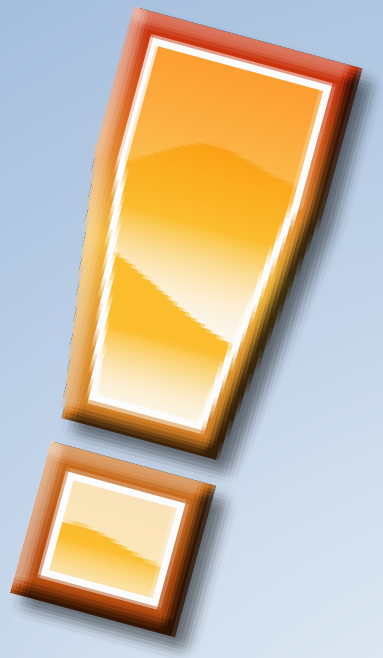
Bryan E. Bledsoe, DO, FACEP, A. Keith Wesley, MD, FACEP, Marc Eckstein, MD, FACEP, Thomas M. Dunn, PhD, Michael F. O'Keefe, MS

J Trauma. 2006;60:1257–1266.



CONCLUSIONS.

HEMS response is characterized by overtriage and overuse.



EMS and Emergency Department Physician Triage:

Injury Severity in Trauma Patients Transported by Helicopter

Jeffrey S. Lubin, MD, MPH, Theodore R. Delbridge, MD, MPH, John S. Cole, MD, Dederia H. Nicholas, RN, Christopher A. Fore, MD, Richard J. Wadas, MD

PREHOSPITAL EMERGENCY CARE 2005;9:198–202

	Interhospital ($n = 345$)	Scene ($n = 658$)	p-value
ISS < 6	11.0% (7.9–14.8)	13.5% (11.0–16.4)	0.256
ISS 6–15	47.0% (41.6–52.3)	49.3% (45.5–53.3)	0.463
ISS > 15	42.0% (36.8–47.4)	37.1% (33.4–40.9)	0.127
Overall			0.243

CONCLUSIONS.

Scene and interhospital HEMS trauma missions in this system involve patients of similar injury severities.

Prehospital providers may triage trauma patients to HEMS transport with proficiency similar to that of community ED physicians.

So ***when*** do you call for a helicopter?

PENNSTATE HERSHEY
Milton S. Hershey Medical Center

Good People. Great Medicine.™
PennStateHershey.org

Focus on Helicopter EMS

Validity of Helicopter Emergency Medical Services Dispatch Criteria for Traumatic Injuries:

A Systematic Review

Akkie N. Ringburg, MD, Gijs de Ronde, MD, Stephen H. Thomas, MD, MPH,
Esther M. M. van Lieshout, PhD, Peter Patka, MD, PhD, Inger B. Schipper, MD, PhD

PREHOSPITAL EMERGENCY CARE 2009;13:28–36

OBJECTIVE.

Provides a overview of the validity of HEMS dispatch criteria for severely injured patients.

METHODS.

A systematic literature search was performed. English written and peer reviewed publications on HEMS dispatch criteria were included.

RESULTS.

Found 34 papers
with a total of 49 HEMS dispatch criteria identified

Level I = Systematic review of randomized controlled trials

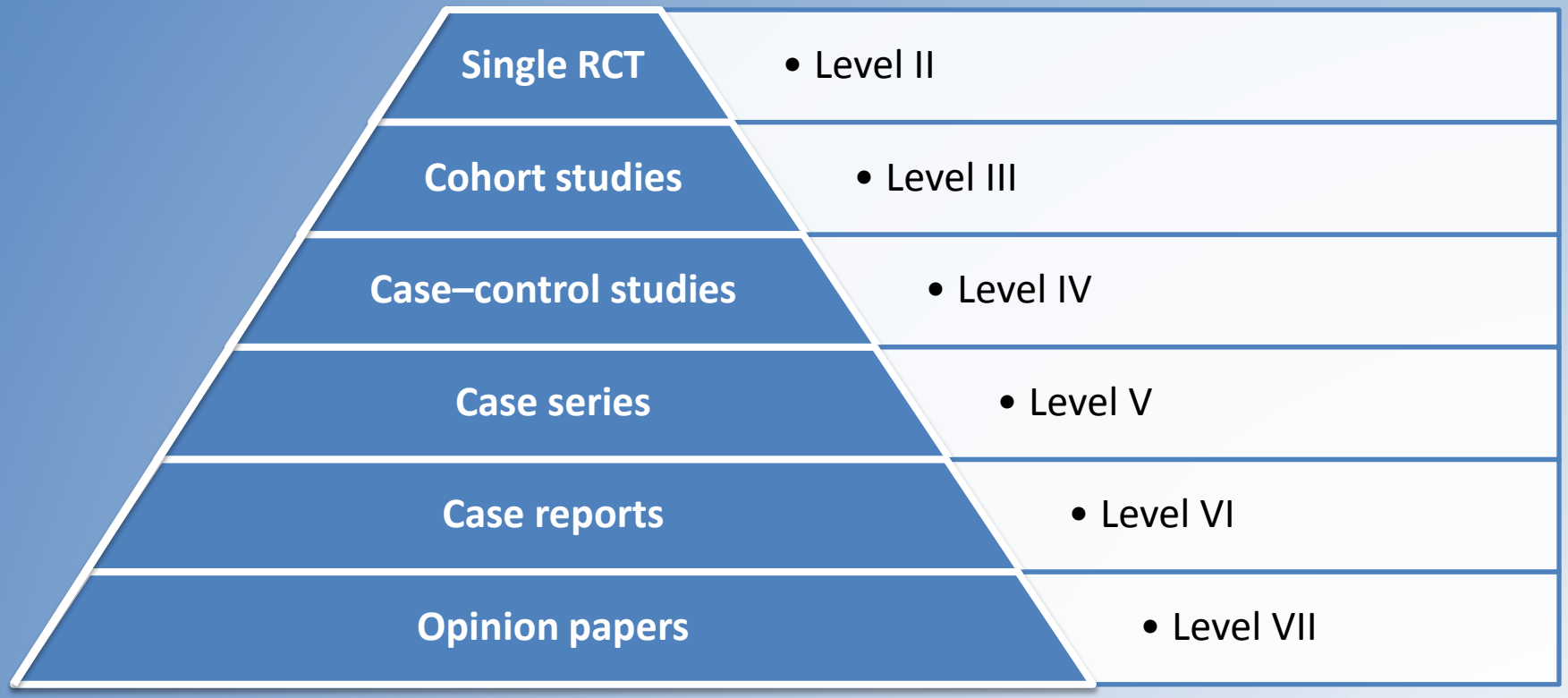


TABLE 3. Accuracy of Criteria for Appropriate Helicopter Emergency Medical Services Dispatch, Sorted by Level of Evidence

Reference*	Criterion	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Level of Evidence
Rhodes et al., 1986[10]	Entrapment					III
	Physiologic					
	LOC					
	RR					
	P					
	BP					
Coats et al., 1993[9]	MOI group					III
Schoettker et al., 2001[11]	Ejection					III
Moront et al., 1996[12]	GCS					IV
	P + GCS					
Wuerz et al., 1996[13]	MOI + anatomy					V
	Physiologic					
	Age + comorbidity					
	Triage scheme					

*For full reference citations, see the reference list.
BP = blood pressure; GCS = Glasgow Coma Scale score; LOC = loss of consciousness; MOI = mechanism of injury; NPV = negative predictive value; P = pulse; PPV = positive predictive value; RR = respiratory rate; III = cohort study; IV = case–control study; V = case series.

Sensitivity:

The proportion of people who have the disease who test positive for it

Specificity:

The proportion of patients who do not have the disease who test negative for it

TABLE 3. Accuracy of Criteria for Appropriate Helicopter Emergency Medical Services Dispatch, Sorted by Level of Evidence

Reference*	Criterion	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Level of Evidence
Rhodes et al., 1986[10]	Entrapment	43	45			III
	Physiologic	98	43			
	LOC	93	85			
	RR	52	77			
	P	43	75			
	BP	33	77			
Coats et al., 1993[9]	MOI group			27		III
Schoettker et al., 2001[11]	Ejection			59		III
Moront et al., 1996[12]	GCS	98	96			IV
	P + GCS	99	90			
Wuerz et al., 1996[13]	MOI + anatomy	87	20	32	23	V
	Physiologic	56	86	76	30	
	Age + comorbidity	56	45	23	10	
	Triage scheme	97	8	47	22	

*For full reference citations, see the reference list.
BP = blood pressure; GCS = Glasgow Coma Scale score; LOC = loss of consciousness; MOI = mechanism of injury; NPV = negative predictive value; P = pulse; PPV = positive predictive value; RR = respiratory rate; III = cohort study; IV = case–control study; V = case series.

CONCLUSIONS.

Loss of consciousness seems promising

Mechanism of injury criteria lack accuracy

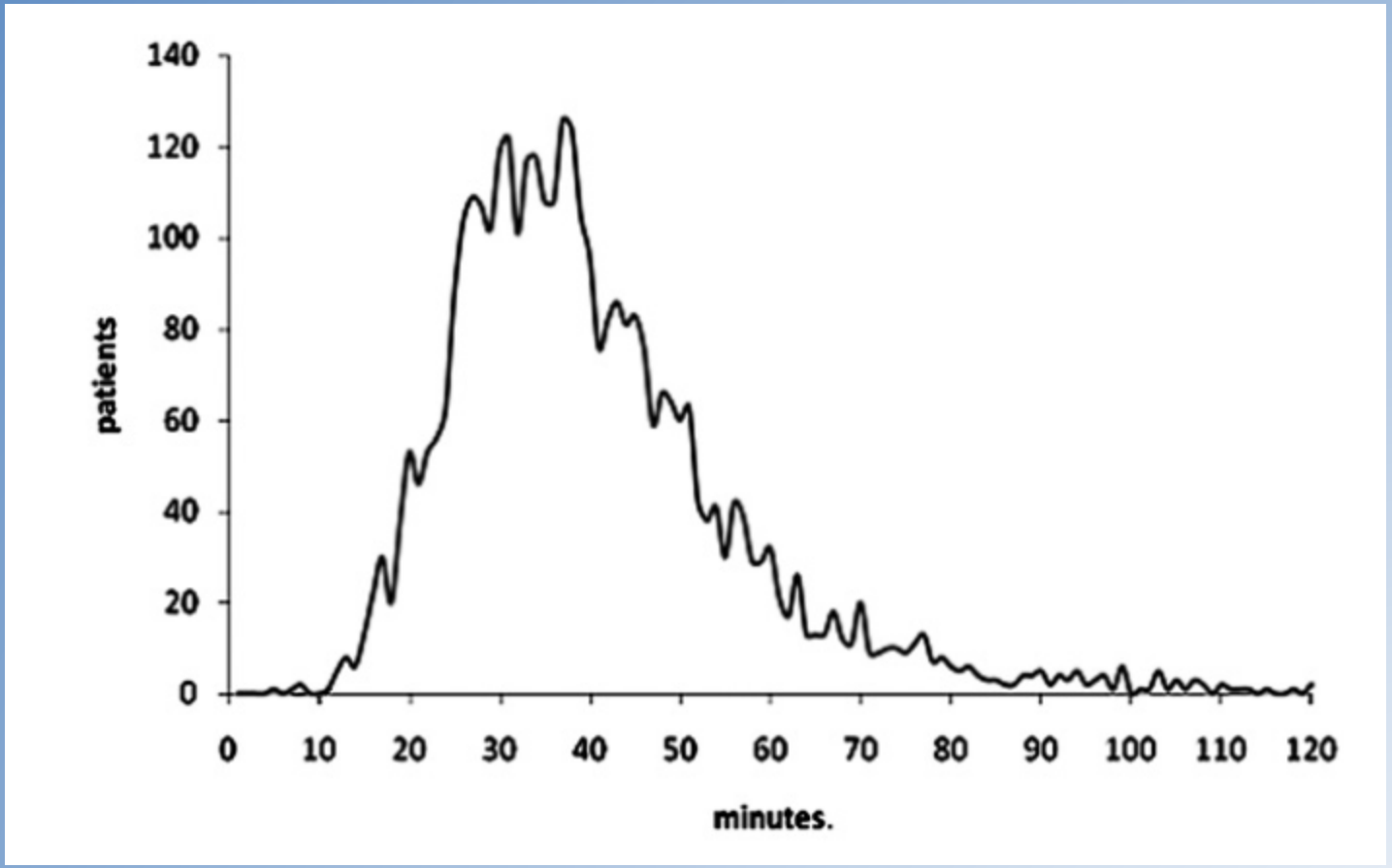
More research is needed

The concept of the **“golden hour”** seems to be going away.

Emergency Medical Services Intervals and Survival in Trauma: Assessment of the "Golden Hour" in a North American Prospective Cohort

Annals *of* Emergency Medicine

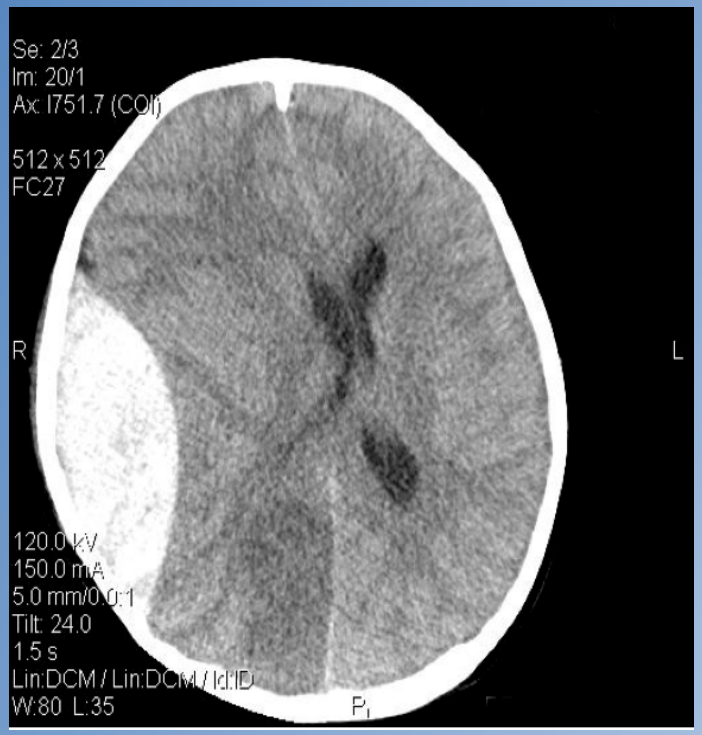
Volume 55, NO. 3 : March 2010


140
120
100
80
60
40
20
0
patients
0
10
20
30
40
50
60
70
80
90
100
110
120
minutes.

The concept of the **"golden hour"** seems to be going away.

CONCLUSIONS.

There was no association between EMS intervals and mortality among injured patients with physiologic abnormality in the field.



HEMS seems to have a positive impact on **Head Injury**.

The Impact of Aeromedical Response to Patients With Moderate to Severe Traumatic Brain Injury

Annals *of* Emergency Medicine

Volume 46, NO. 2 : August 2005

Variable	No.	Mortality or Good Outcomes (%)	OR (95% CI)	Adjusted OR (95% CI)
All patients				
Air transports	3,017	759 (25.2)	1.01 (0.91, 1.11)	1.90 (1.60, 2.25)†
Ground transports	7,295	1,845 (25.3)		
Good outcomes				
Air transports	3,017	1,737 (57.6)	0.97 (0.89, 1.06)	1.36 (1.18, 1.58)†
Ground transports	7,295	4,256 (58.3)		
Head AIS 3				
Air transports	1,030	67 (6.5)	0.86 (0.64, 1.15)	1.86 (1.17, 2.96)‡
Ground transports	2,725	153 (5.6)		
Head AIS 4+				
Air transports	1,977	689 (34.9)	1.08 (0.97, 1.21)	1.68 (1.39, 2.03)†
Ground transports	4,636	1701 (36.7)		
GCS score 3-8				
Air transports	1,527	666 (43.6)	1.24 (1.09, 1.40)†	1.84 (1.51, 2.23)†
Ground transports	2,996	1464 (48.9)		
GCS score 9-12				
Air transports	328	38 (11.6)	1.25 (0.85, 1.84)	1.15 (0.60, 2.21)
Ground transports	874	123 (14.1)		
GCS score 13-15				
Air transports	1,152	52 (4.5)	1.28 (0.94, 1.75)	1.19 (0.66, 2.13)
Ground transports	3,491	199 (5.7)		

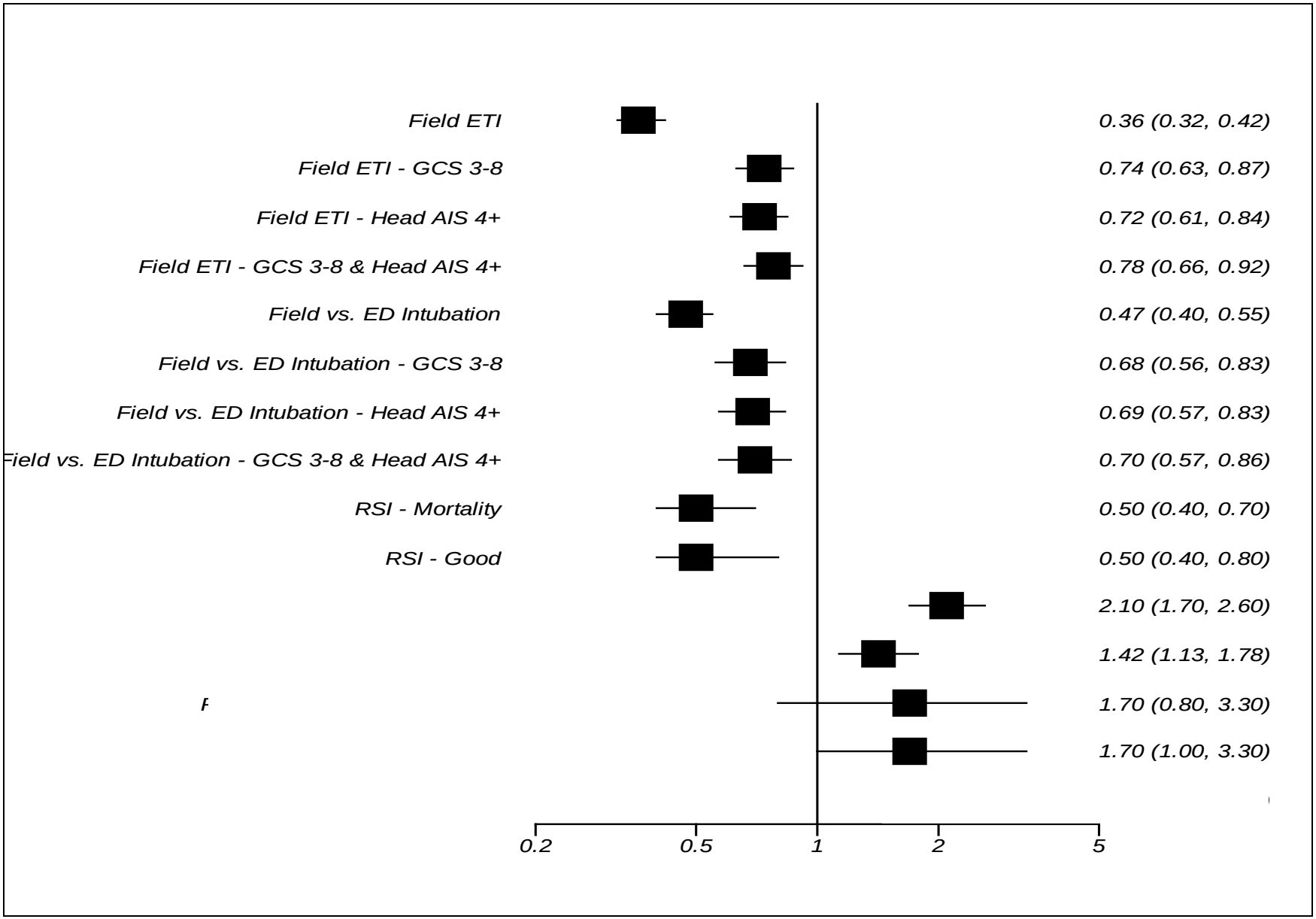
AIS, Abbreviated Injury Score; *GCS,* Glasgow Coma Scale; *ISS,* Injury Severity Score.
*Separate comparisons were made after stratification by head Abbreviated Injury Score and GCS. ORs were adjusted for age, sex, mechanism, preadmission hypotension, head Abbreviated Injury Score, ISS, and preintubation GCS score.
†$P<.001$.
‡$P<.05$.

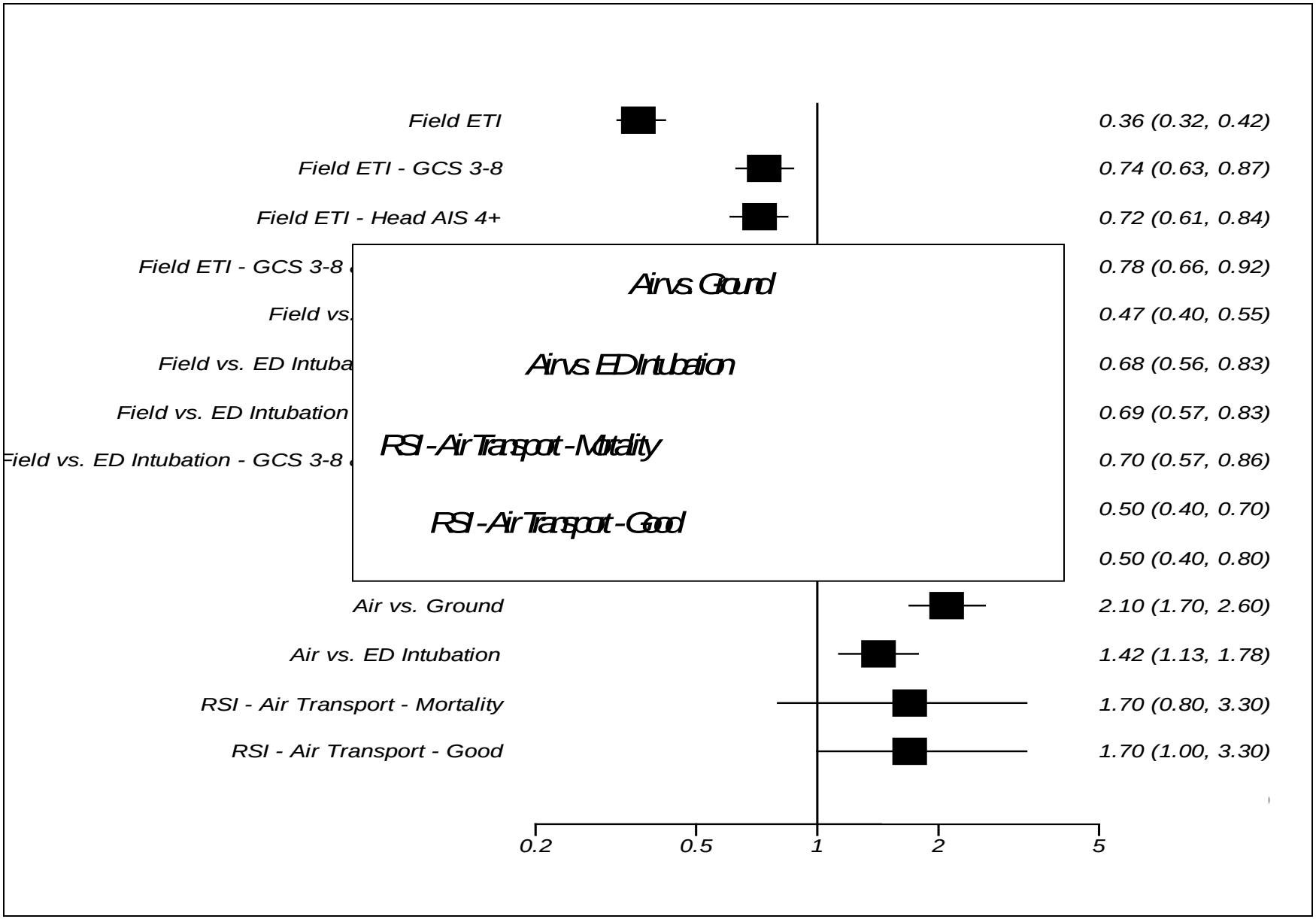
CONCLUSION.

HEMS appears to result in improved outcomes after adjustment for multiple influential factors in patients with moderate to severe traumatic brain injury.

HEMS seems to have a positive impact on **Head Injury**.

Compromised out-of-hospital **airways** may be more effectively managed by HEMS than ground EMS.


Field ETI
Field ETI - GCS 3-8
Field ETI - Head AIS 4+
Field ETI - GCS 3-8 & Head AIS 4+
Field vs. ED Intubation
Field vs. ED Intubation - GCS 3-8
Field vs. ED Intubation - Head AIS 4+
Field vs. ED Intubation - GCS 3-8 & Head AIS 4+
RSI - Mortality
RSI - Good
0.36 (0.32, 0.42)
0.74 (0.63, 0.87)
0.72 (0.61, 0.84)
0.78 (0.66, 0.92)
0.47 (0.40, 0.55)
0.68 (0.56, 0.83)
0.69 (0.57, 0.83)
0.70 (0.57, 0.86)
0.50 (0.40, 0.70)
0.50 (0.40, 0.80)
2.10 (1.70, 2.60)
1.42 (1.13, 1.78)
1.70 (0.80, 3.30)
1.70 (1.00, 3.30)
0.2
0.5
1
2
5


Field ETI
Field ETI - GCS 3-8
Field ETI - Head AIS 4+
Field ETI - GCS 3-8
Field vs.
Field vs. ED Intuba
Field vs. ED Intubation
Field vs. ED Intubation - GCS 3-8
Air vs. Ground
Air vs. ED Intubation
RSI - Air Transpoot - Mortality
RSI - Air Transpoot - Good
Air vs. Ground
Air vs. ED Intubation
RSI - Air Transport - Mortality
RSI - Air Transport - Good
0.36 (0.32, 0.42)
0.74 (0.63, 0.87)
0.72 (0.61, 0.84)
0.78 (0.66, 0.92)
0.47 (0.40, 0.55)
0.68 (0.56, 0.83)
0.69 (0.57, 0.83)
0.70 (0.57, 0.86)
0.50 (0.40, 0.70)
0.50 (0.40, 0.80)
2.10 (1.70, 2.60)
1.42 (1.13, 1.78)
1.70 (0.80, 3.30)
1.70 (1.00, 3.30)
0.2
0.5
1
2
5

Compromised out-of-hospital **airways** may be more effectively managed by HEMS than ground EMS.

As your scene gets closer to the receiving hospital, HEMS becomes less useful/effective.

56 COMPARISON BETWEEN HELICOPTER-EMS AND GROUND-EMS TRANSPORT TIME AND OUTCOMES FOR SEVERELY INJURED PATIENTS IN AREAS WITHIN A 5- TO 15-MILE RADIUS FROM A TRAUMA CENTER **Jack F. Basile, Barbara Sorondo,** *Philadelphia College of Osteopathic Medicine*

CONCLUSIONS.

1. The average time of HEMS, when within a 5–15-mile radius of the admitted hospital, is **longer** than the average time of transport of patients by ambulance.

CONCLUSIONS.

2. After controlling for severity, there were **higher** in-hospital mortality rates, in-hospital mortality within 24 hours of admission rates, and complications among patients transported by helicopters than those transported by ambulance.

As your scene gets closer to the receiving hospital, HEMS becomes less useful/effective.


N896LL
Life Lion


4-K

< 20 min

DRIVE

20-30 min

“GRAY ZONE”

> 30 min

FLY

PENNSTATE HERSHEY

Milton S. Hershey Medical Center

Good People. Great Medicine.™

PennStateHershey.org

Scene or Elsewhere?

- May be better to land HEMS away from the scene
  - Safety
  - Convenience
  - Timing
- If possible, use an LZ that sends the ambulance in the direction of the hospital
- Do not delay transport to wait for HEMS

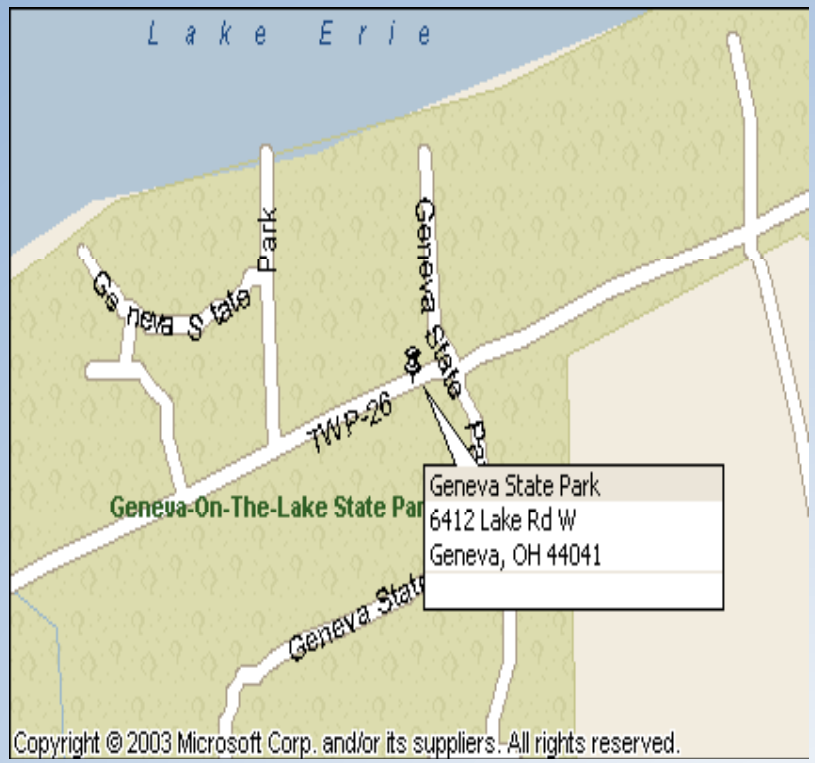
Predesignated LZ

- **Address:** Geneva State Park
  6412 Lake Road West
  Geneva, Ohio 44041

- **Coordinates**: N 41°51.15
  W 080°59.08

- **LZ Description:** Large parking lot, south side of road. Creek tributary just West of LZ. Lake Erie is 200 yards north of LZ.

- **Hazards:** Wires on South side of road



PENNSTATE HERSHEY
Milton S. Hershey Medical Center
1855

Good People. Great Medicine.™
PennStateHershey.org

Established Helipads

- Well marked
- Generally clear of obstacles

- **Safer!**

EMTALA?

"The use of a hospital's helipad by local ambulances or other hospitals for the transport of individuals to tertiary hospitals located throughout the state does not trigger an EMTALA obligation for the hospital that has the helipad on its property when the helipad is being used for the purpose of transit…the hospital with the helipad is not obligated to perform another MSE prior to the individual's continued travel to the recipient hospital. If, however, while at the helipad, the individual's condition deteriorates, the hospital at which the helipad is located must provide another MSE and stabilizing treatment within its capacity if requested by medical personnel accompanying the individual."

The “Pearls”

- Research supports the use of HEMS for certain trauma patients, particularly those with head injuries or airway problems

- There are limitations and risks associated with HEMS transport
- Although there are no great studies to base this on, consider HEMS at the 20-30 min transport zone
- Consider establishing predesignated LZ’s for increased safety
- Do not delay transport waiting for HEMS

Questions?

jlubin@hmc.psu.edu