Comparing rural ground and air EMS: A Level 1 Trauma Center's Experience

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Presenter Disclosures

Friedrich M. von Recklinghausen

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"No relationships to disclose"

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Learning Objective

Describe the differences between patient populations arriving by air or ground to a rural Level I trauma center.

Background

- No recent review of ground versus air transport in the rural environment
- Rarely evaluated
- IRB Approval CPHS #21911

Introduction

- Level I Trauma Center Located in Northeast U.S.
  - Several Ground Services
  - One Air Service
- Inclusion Criteria
  - Transported directly from the field
- Study Period 2003-2008
- 2,164 patients

Research Question/ Hypothesis

What are the differences in ground and air EMS patients transported directly from the scene?

H_A – There are differences in ground and air EMS patients transported directly from the scene.

Variables

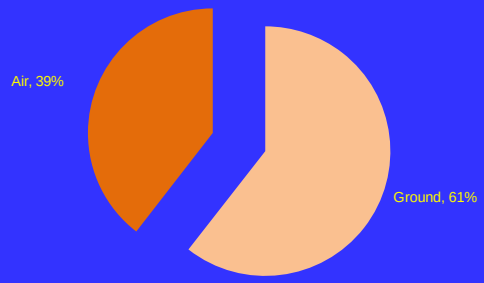
- Age
- Gender
- Vital signs
- GCS
- LOS
- ICU days
- Ventilator days
- ED LOS
- Discharge location
- Survival to discharge
- ISS

Methodology

- Raw data from Trauma Registry
- Categorize in MS Excel
  - Year, month, day of week, ISS, E-code, and age groupings
- Analysis In Stata
  - Continuous variables Student's t-test
  - Categorical variables Chi square
- Statistical significance $p<.05$

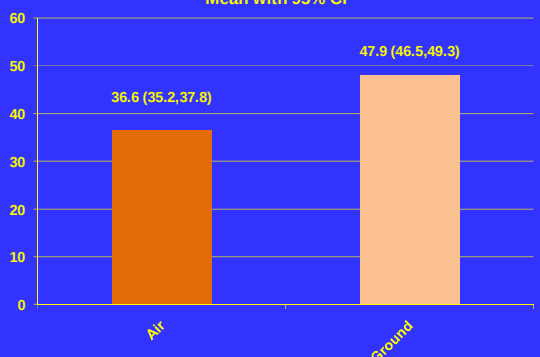
Results

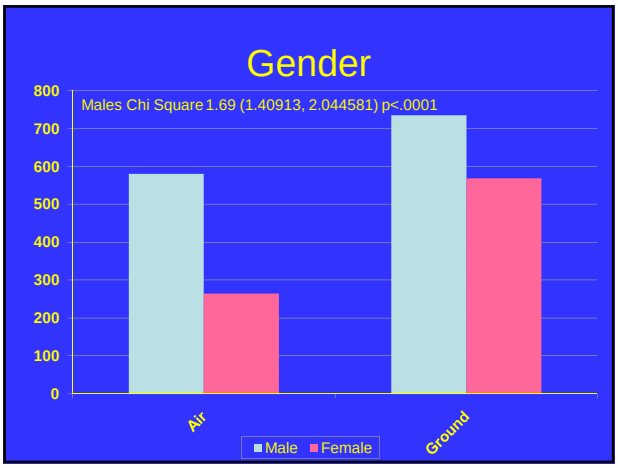
Transport

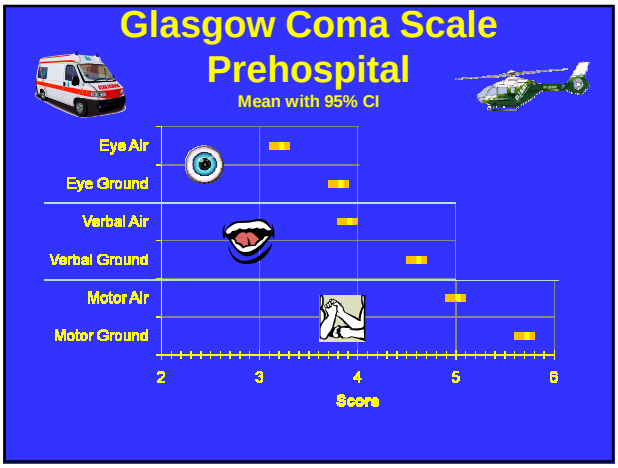


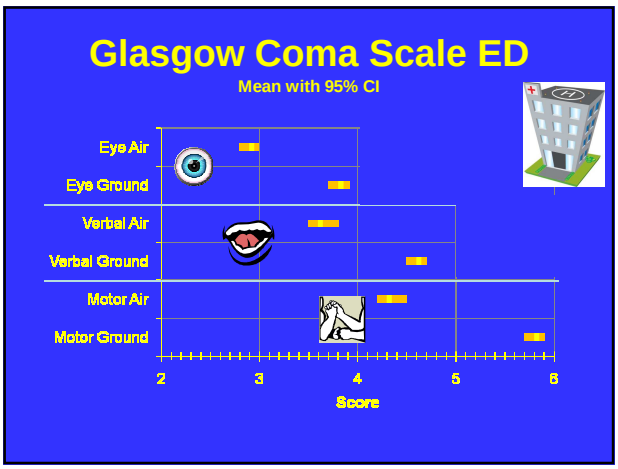
Age

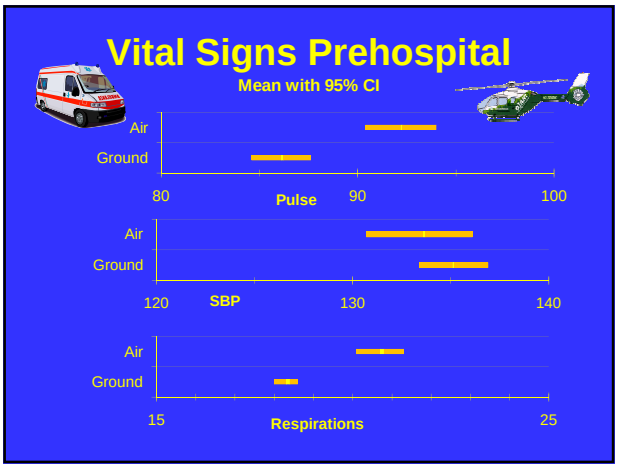
Mean with 95% CI

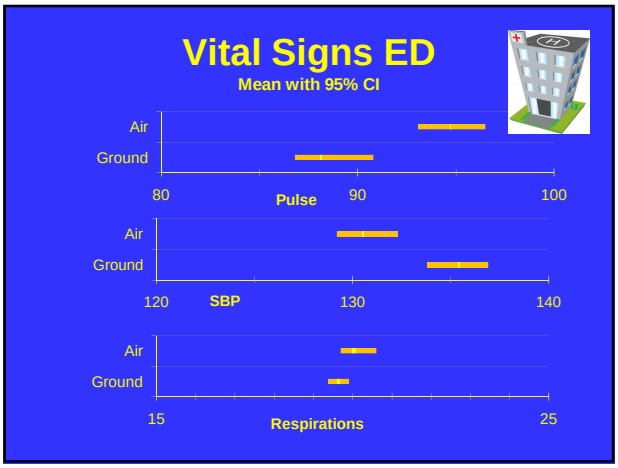


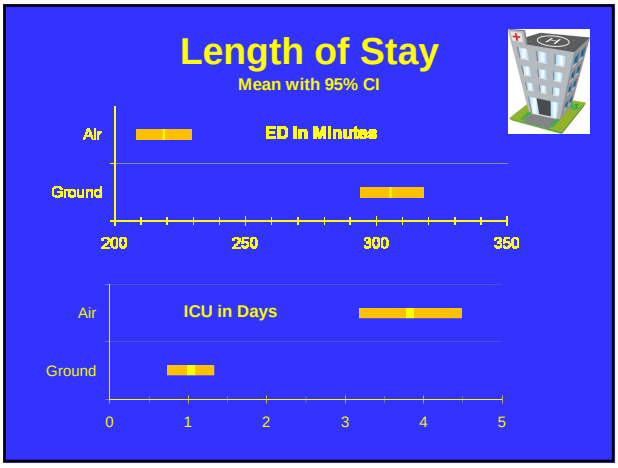

Gender
Males Chi Square 1.69 (1.40913, 2.044581) p<.0001
800
700
600
500
400
300
200
100
0
Air
Ground
Male
Female


Glasgow Coma Scale
Prehospital
Mean with 95% CI
Eye Air
Eye Ground
Verbal Air
Verbal Ground
Motor Air
Motor Ground
2
3
4
5
6
Score


Glasgow Coma Scale ED
Mean with 95% CI
Eye Air
Eye Ground
Verbal Air
Verbal Ground
Motor Air
Motor Ground
2
3
4
5
6
Score

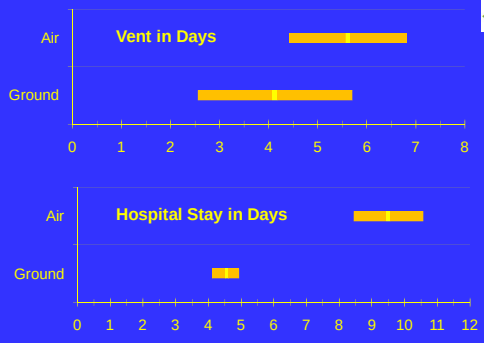

Vital Signs Prehospital
Mean with 95% CI
Air
Ground
80
Pulse
90
100
Air
Ground
120
SBP
130
140
Air
Ground
15
Respirations
25


Vital Signs ED
Mean with 95% CI
Air
Ground
80
Pulse
90
100
Air
Ground
120
SBP
130
140
Air
Ground
15
Respirations
25

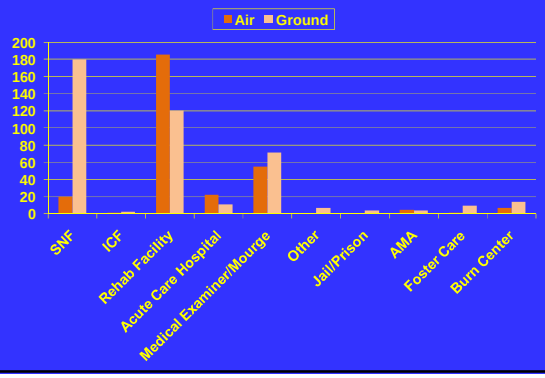

Length of Stay
Mean with 95% CI
Air
ED In Minutes
Ground
200
250
300
350
Air
ICU in Days
Ground
0
1
2
3
4
5

Length of Stay

Mean with 95% CI

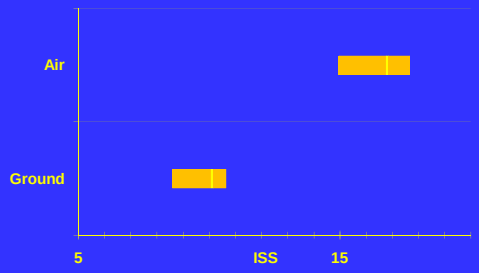


Disposition Other than Home

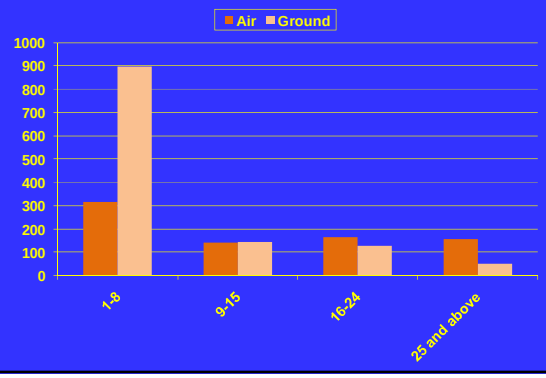


Injury Severity Score

Mean with 95% C.I.

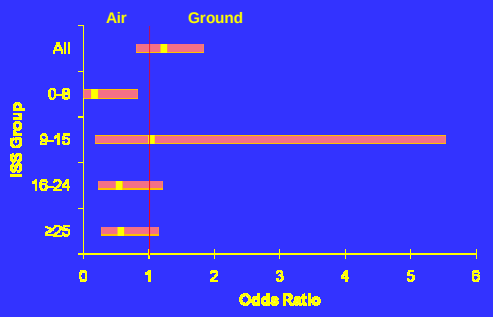


Survival and ISS



Death of Air Patients by ISS Group

OR with 95% CI



Conclusions

- Air transported patients:
  - Significantly younger and more males
  - Lower GCS Prehospital and in ED
  - Higher pulse and respirations Prehospital
  - Higher pulse and lower BP in ED
  - LOS
    - Shorter in ED
    - Longer ICU and Hospital LOS, n.s Vent days

- Disposition
  - Most patients discharged home
  - Ground SNF
  - Air Rehabilitation
- ISS
  - Air higher
  - Greater number of more severely injured patients

Limitations

- One rural trauma center
- Limited number of patients
- Weather
- Decision to fly based upon Ground providers decision

Next steps

- Match case-control study for survival
- Comparison of rural patients using NTDB
- Evaluation of air and ground provider skills.
- Determination of optimal use of air transport for the trauma patient.

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Thank You!

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