Anatomy of a RESEARCH PAPER

Bax Larmon

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Writing, editing, and publishing the paper is the last step in the research process.

The paper tells the story of the project from inception, through the data-collection process, statistical analysis, and discussion of the results.

It could be years from the inception and start of the project until the paper is published.

Note: *In some cases the research is out of date the day it is published*

Peer Reviewed EMS Journals

- Academic Emergency Medicine
- Annals Of Emergency Medicine
- Prehospital Emergency Care
- American Journal of Emergency Medicine
- Emergency Medicine Journal
- European Journal of Emergency Medicine
- Journal of Emergency Medicine
- Prehospital and Disaster Medicine

Research Paper Anatomy
Head to Toe Assessment

- The Journal
- Author(s)
- The Title
- Financial and Equipment Support
- Conflicts of Interest

Research Paper Anatomy

- The Abstract
- The Introduction Section
- Hypothesis
- The Methods Section
  - Subjects
  - Equipment
  - Interventions or Study Procedures
  - Data Analysis

Research Paper Anatomy

- The Results Section
- The Discussion Section
- Limitation Section
- The Conclusions Section
- Acknowledgements

Title

- Alerts you to the topic of your paper.
- Draws you to investigate the substance of your paper.

Authors

- First Author is known as the Principal Investigator
- Should be the person that is MOST Involved in the research
  - Often times may not

Authors

- From a practical standpoint, most papers are written by 1 or 2 primary authors.
  - The remaining authors have reviewed the work and/or aided in study design or data analysis.
  - Frequently, other members of a research group are included as authors because of their positions and the pressure to publish in pursuit of promotion and tenure.

Financial and Equipment Support

- The title page should also list specific information about organizations, agencies, or companies that supported the research
  - Either financially or by providing equipment, services, or personnel.
- If the research was supported by a grant that will also be disclosed

Conflicts of Interest

- Should explain conflicts of interest.
  - The most common conflict of interest is that one of the authors has a financial affiliation with a company that produces one of the products tested or discussed in the research.

Abstract

- Like a “trailer to a movie”
  - It’s job is to suck you in
- It should accurately reflect the content of the paper
- It is a synopsis of the paper
- VERY LIMITED words (<300 – 650 usually)

Abstract

- Usually has structure
- The abstract is “just the facts” presentation of the research.
- Has NO or limited detail, especially methods
- NEVER site a article based solely on the abstract
- Allows you to “triage” what you may want to further investigate

Introduction

- In some journals also called “background”
- It lays the foundation for the paper.
- Mentions the most important references and state the research problem
- Should include the importance of the problem and list unresolved issues.
- Should include the rationale for the current study

Hypothesis

- A statement of the problem
  - Should include a null hypothesis
- In some paper's there might not have a hypothesis

  In that case they have a Problem or a Purpose

Methods

- Should describe in detail how the study was performed.
  - Ideally, after reading your methods section another researcher could duplicate your study.
  - It is like a recipe

Methods / Subjects

- Should describe how the subjects were recruited and selected.
- Describe the inclusion and exclusion criteria.
- Describe relevant characteristics
  - Demographics

Methods / Equipment

- Describe in detail the equipment used in the study
  - Includes how
- If someone wants to reproduce the results, they must know what equipment was used and how

Methods / Intervention or Procedure

- This section describes what clinical procedures or interventions were done and what data were collected.
- Depending on the type of study, this section may include a description of the experimental protocol and a timeline for procedures and measurements.
  - If possible the protocol should be included

Methods / Data Analysis

- Should describe how the data were handled, what statistical tests were done, and what p value was deemed to indicate a statistically significant difference.
- In some cases an explanation of why the statistical tests selected was appropriate.

Results

- Should include only the results
  - many authors place opinion
- Should simply state the findings, without bias or interpretation
- Can be done in words, graphs, or diagrams
- Should ONLY confirm or reject a hypothesis.
  - Unfortunately not always done

Discussion

- Is the place for interpreting the results.
- Should use the statistical results to make conclusions regarding the research question
- A few historical references may be helpful for perspective.
- Most of the references should be recent and aid in the interpretation of your results. If a report you cited disagrees with your findings, clearly explain why.
- The discussion section is your chance to review the current knowledge and explain how your study's findings add to the body of knowledge..

Discussion

- Is the place for interpreting the results.
- Should use the statistical results to make conclusions regarding the research question
- Some historical references may be included for perspective.
  - Should be referenced
  - Might include litature that disagrees with the findings
    - Should discuss why
- Should review the current knowledge and explain how your study's findings add to the body of knowledge.

Limitations

- Should state what problems occurred
- What the author believes were weaknesses
- If done again the author would have _____

Conclusion

- Should be a final statement that either supports or does not support the Question
- Usually indicate s what research question(s) should be answered next

Example 1

Display Settings: Abstract

Send to:

Acad Emerg Med. 2000 Oct;7(10):1165.

EMS transports for difficulty breathing: is there a potential role for CPAP in the prehospital setting?

Kosowsky JM, Gasaway MD, Stephanides SL, Ottaway M, Sayre MR.

University of Cincinnati, Cincinnati, OH.

Abstract

Mask-applied continuous positive airway pressure (CPAP) has been shown to reduce morbidity among patients with acute respiratory distress in the setting of cardiogenic pulmonary edema.

OBJECTIVE: To determine a minimum percentage of patients transported by ALS for difficulty breathing who could potentially benefit from a pre-hospital trial of CPAP.

METHODS: Paramedic run sheets were collected from consecutive, adult, ALS transports for a chief complaint of difficulty breathing over a 6 week period in a large urban EMS system. Demographic information, medical history, vital signs, clinical assessments, and transport times were abstracted into a database by trained reviewers. Strict criteria for CPAP were defined in advance as "acute respiratory distress," meaning (1) respiratory rate > 25 and (2) labored or shallow breathing, and "presumed cardiogenic pulmonary edema," meaning (3) a prior history of heart disease and (4) presence of bilateral rales on exam.

RESULTS: Data from 240 consecutive run sheets were compiled. Median patient age was 66 years old, with females outnumbering males 168 to 81. A total of 15 spontaneously breathing patients met all 4 criteria for CPAP. Four of these patients were either hypotensive (SBP < 90) or had potential for airway compromise (i.e., obtundation), making CPAP inadvisable. Among the 11 remaining patients (4.4% of all transports for difficult breathing), median transport time was 20 minutes (range 14-31 minutes).

CONCLUSIONS: Using very strict criteria, a small but not significant percentage of patients are optimal candidates for a prehospital trial of CPAP. Transport times would appear to justify this type of intervention. A prospective study is currently under way to test the feasibility of administering CPAP to such patients in the prehospital setting.

PMID: 11015253 [PubMed - as supplied by publisher]

LinkOut - more resources

2000 SAEM MIDWEST RESEARCH ABSTRACTS

These abstracts were presented at the Tenth Annual SAEM Ohio/Midwest Regional Research Symposium, held at Wright State University, Dayton, Ohio, on May 5, 2000. The Symposium was organized this year by James Olson, PhD, and James Brown, MD, and the publication of these abstracts is funded by the Symposium. They are presented here as they were submitted, and the authors are responsible for the contents. Previously published abstracts are not reproduced here; the reference for the previous publication is given.

01 Antioxidant Treatment Improves Bioenergetics Following Ischemia/Reperfusion *Paul Klawitter; Ohio State University, Columbus*

Published in: Acad Emerg Med. 2000; 7: 507–8.

02 The Accuracy of the Emergency Physician at Diagnosing CVA/TIA in the Acute Care Setting *Stephen D. Ulaki, Marcus A. Topinka, William R. Frasser; OUCOM/Doctors Hospital, Columbus, OH*

Objective: To determine the accuracy of the ED physician at diagnosing CVA/TIA in the 30% overtreatment rate is accurate, then the NNH is approximately 333 assuming an ICH rate of 1%. For 1,000 patients treated, 100 may benefit (improved function) and 3 would die who did not have the disease. **Conclusions:** The accuracy rate of the diagnosis of CVA at initial presentation is 67%. This is due to many initial neurologic changes being TIAs and some other diagnoses which can mask as CVA. Choosing thrombolysis for CVA treatment will involve treatment of many patients who do not have disease.

03 EMS Transports for Difficulty

dation), making CPAP inadvisable. Among the 11 remaining patients (4.4% of all transports for difficult breathing), median transport time was 20 minutes (range 14–31 minutes). **Conclusions:** Using very strict criteria, a small but not significant percentage of patients are optimal candidates for a prehospital trial of CPAP. Transport times would appear to justify this type of intervention. A prospective study is currently under way to test the feasibility of administering CPAP to such patients in the prehospital setting.

04 Etomidate-facilitated Hip Reduction

Example 2

Display Settings: Abstract

Send to:

Ann Surg. 2010 Dec 20. [Epub ahead of print]

Prehospital Intravenous Fluid Administration is Associated With Higher Mortality in Trauma Patients: A National Trauma Data Bank Analysis.

Haut ER, Kalish BT, Cotton BA, Efron DT, Haider AH, Stevens KA, Kieninger AN, Cornwell EE 3rd, Chang DC.

*Division of Acute Care Surgery, Department of Surgery, The Johns Hopkins University School of Medicine, Baltimore, MD †Department of Surgery and The Center for Translational Injury Research, The University of Texas Health Science Center at Houston, Houston, TX ‡Department of Health Policy and Management, The Johns Hopkins University Bloomberg School of Public Health §Department of Surgery, Washington University School of Medicine, St. Louis, MO ¶Department of Surgery, Howard University College of Medicine, Washington, DC ‖ Director of Outcomes Research, Department of Surgery, University of California San Diego, San Diego, CA.

Abstract

OBJECTIVE: Prehospital intravenous (IV) fluid administration is common in trauma patients, although little evidence supports this practice. We hypothesized that trauma patients who received prehospital IV fluids have higher mortality than trauma patients who did not receive IV fluids in the prehospital setting.

METHODS: We performed a retrospective cohort study of patients from the National Trauma Data Bank. Multiple logistic regression was used with mortality as the primary outcome measure. We compared patients with versus without prehospital IV fluid administration, using patient demographics, mechanism, physiologic and anatomic injury severity, and other prehospital procedures as covariates. Subset analysis was performed based on mechanism (blunt/penetrating), hypotension, immediate surgery, severe head injury, and injury severity score.

RESULTS: A total of 776,734 patients were studied. Approximately half (49.3%) received prehospital IV. Overall mortality was 4.6%. Unadjusted mortality was significantly higher in patients receiving prehospital IV fluids (4.8% vs. 4.5%, $P < 0.001$). Multivariable analysis demonstrated that patients receiving IV fluids were significantly more likely to die (odds ratio [OR] 1.11, 95% confidence interval [CI] 1.05-1.17). The association was identified in nearly all subsets of trauma patients. It is especially marked in patients with penetrating mechanism (OR 1.25, 95% CI 1.08-1.45), hypotension (OR 1.44, 95% CI 1.29-1.59), severe head injury (OR 1.34, 95% CI 1.17-1.54), and patients undergoing immediate surgery (OR 1.35, 95% CI 1.22-1.50).

CONCLUSIONS: The harm associated with prehospital IV fluid administration is significant for victims of trauma. The routine use of prehospital IV fluid administration for all trauma patients should be discouraged.

PMID: 21178760 [PubMed - as supplied by publisher]

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Thanks for listening

Bax and Dave