

Welcome to the



Prehospital Research – an introduction.



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Prehospital Research – an introduction

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Objectives

- Definition of research
- Contrast with audit
- Understand the reasons for researching
- Outline the area of Prehospital research
- Explore the barriers to Prehospital research
- List the first steps to start a research project.

Case study

<https://meded.reeldx.com/cases/411>

Back up video : <https://www.youtube.com/watch?v=J5HrYHoEUfk> "car crash"

What is research?



What is research?



Definitions:

- Research?
 - Systematic investigation into and study of material and sources in order to establish facts and reach new conclusions.
- Audit?
 - Examine existing practice against a gold standard.
 - Identify area of improvement.
 - Act as foundation for research question.

Why research?

- Basis of medical research
 - Curiosity
 - Sense of wonder
 - Desire to understand

Why research?

- **In practice**
 - To describe what is happening
 - To understand what is happening
 - Replace subjective impression with objective data
 - Improve quality of medical interventions
 - Obtain political or financial support
 - Demonstrate expertise and professionalism

Why research?

- **In reality**
 - Influence change of CPGs
 - Improve patient care
 - To justify what we are doing at present.

Areas of Prehospital research



- **Clinical**
 - Improve current CPG
 - Develop new future CPG
 - Develop future practice

Areas of Prehospital research

- **System design and operations**
 - Examples: (not inclusive)
 - Changes in community and hospital services
 - How changes impact on EMS
 - Practitioners deployment, utilisation
 - Criteria for dispatch
 - Treatment (transport or refer)
 - Geographic vs population based EMS
 - Integration of EMS (Hospital, Community care, Primary care)

Area of Prehospital research



- **Education**
 - Initial education
 - Ongoing education
- **Improving global outcome**
 - Examples: (not inclusive)
 - Medical errors
 - Disparity in provision
(Geographic, Socio-economics)
 - Effect of centralised care
(Practitioners, EMS, Patients)
 - Major Emergency Planning

Barriers to Prehospital research

- **Setting**
 - Environment
 - Acute nature of events
 - Unpredictable
 - Place
 - Time
 - Type
 - Patient

Barriers to Prehospital research

- **Culture**

- Practitioners (trained rather than educated)
- Managers (limited operational staff / resources / education)
- National policies (lack of implementation)
 - Education institutions
 - Organisations' strategy
- Funding (lack of)
 - To research elements
 - Protected time
 - Protected leave

Barriers to Prehospital research



- **Access to Data**
 - Multiple Ambulance reports system
 - Paper based
 - Little ED access
 - Data protection laws
 - Limited access to literature

Why research?



Injury.research.chop.edu

How is research conducted?

- **Identification of research problem**
 - What works?
 - What doesn't work?
 - What could work?
 - Purpose of the research?
 - Change of protocol
 - Change of system
 - Funding

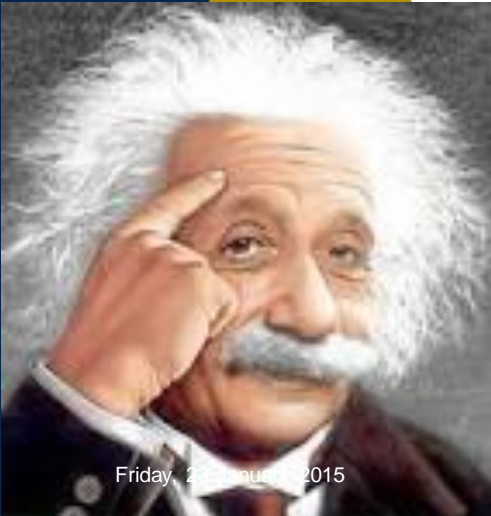
How is research conducted?

- **Literature review**

What has been said about the subject?

How is research conducted?

- **Find a question**
 - Keep it simple
 - Keep it focus on one point
 - What is to be measured?
 - Hypothesis
- *“How we formulate the problem is more important than the solutions.” Einstein*



How is research conducted?

- **Research design**
 - Primary vs secondary
 - Prospective vs retrospective
 - Observational
 - Cohort
 - Case report

How is research conducted?

Research design (continued)

- Interventional:
 - Exposure assigned by researcher
 - Randomisation
 - Blinding

- Systematic review / Meta Analysis

How is research conducted?

- **Methodology**
 - Population
 - Time frame
 - Measurement
 - Data collection point:
 - Ambulance reports
 - Hospital records
 - Survey

How is research conducted?

- **Analysis**
 - Statistics & results interpretation
- **Communicating**
 - Findings and Recommendations
 - Peer reviewed Journals
 - Internal report

Key point

- **Find Help early, very early!**
 - To supervise, guide and critique the project.
 - Hypothesis writing
 - Ethic Committee submission
 - Meeting the Statistician
 - Funding
 - Preparing for publication
 - Ect ...

Research is FUN



Kissing machine, The Big Bang Theory, TBS

Case study

<https://meded.reeldx.com/cases/411>

Back up video : <https://www.youtube.com/watch?v=J5HrYHoEUfk> "car crash"

References

- Venkataraman, A., Anderson, P., Bierens, J., Castrén, M., Jan Christiaen, J., Hoogmartens, O., Qvist Pedersen, O., Sabbe, M., (2014), *Prehospital Research an Introduction*, Aarhus Denmark: Falck Foundation.
- Centre for Prehospital Research (2008) *A National Prehospital Research Strategy*, Limerick: University of Limerick.



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Thank you!



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Literature Search in EMS

"Finding the Evidence"

CPD 29/10/14

Fintan Feerick



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Objectives

- Demonstrate how to perform a minor electronic literature search in a relevant EMS topic using an appropriate medical database.



Motivation

....."Research in the pre-hospital domain of emergency medicine, and the implementation of successful research outcomes, contribute to improved patient care"



www.falckfoundation.com

What we will cover

- What is research ???
- What is a literature search ???
- Benefits of conducting a good search
- Getting started - where to look
- Choose a topic
- Choose a search source
- Choose the appropriate evidence
- Different types of study
- Keeping up with the literature

What is Research ??



What is Research ?

-*"To steal ideas from one person is PLAGIARISM to steal from many is RESEARCH"*

.....*Wilson Mizner*

What is Research ?

- *"....the systematic process of collecting and analysing information (data) in order to increase our understanding of the phenomenon about which we are concerned or interested"*

(Leedy P.D & Ormrod E.J, 2001)

What is a Literature Search ?

- Analysis of prior research to identify Who, What, Where, Whys.
- What has already been published.
- Gain knowledge prior to embarking on a research project.

What is Literature Search ?

- Develop thorough understanding of the topic.
- Build foundation for further research.
- Formulate appropriate methodology.

Literature Search

- ...*"A researcher evaluating different splinting techniques for a fractured leg must know everything possible about both splinting techniques and fractures".*

Literature Search

- ... *"Previous studies will have explored some of the issues surrounding your chosen topic, possible solutions and reveal shortcomings in existing knowledge"*
- *"Changes in clinical practice, teaching methods or system design should never be based on one single study"*

Benefits of a Good Literature Search

- Avoids duplicating works
- Provides strong justification & discussion for your study based on previous research
- Determine the best methods for your research
- Explore gaps & weaknesses in existing studies
- Become familiar with terminologies in your field

Getting started



Getting Started

- 3 main ways to conducting a search:
 1. Computerised search: free/subscribe online database, electronic library (hse, universities ect)
 2. Consulting a librarian (local library, hospital library)
 3. Personal reading (books, papers, journals, paramedic practice, jems, ect)



Choose a Topic???

Choose a Source ?



Sources for searching

Bibliographic/general databases	Publisher databases and journal websites	Subject-specific databases
<i>E.g., Scopus, ISI Web of Knowledge, Google Scholar, EMBASE, JSTOR, ProQuest</i>	<i>E.g., Elsevier's ScienceDirect, SpringerLink, Wiley Online Library, Oxford Journals</i>	<i>E.g., Medline, PsychINFO, MathSciNet, arxiv.org, Sociological Abstracts, EconLit, ERIC, INSPEC</i>
Use to <ul style="list-style-type: none">▪ Browse for popular and high quality articles▪ Start the discovery process and find an initial set of papers	Use to <ul style="list-style-type: none">▪ Browse through journals that frequently publish on your topics of interest▪ Browse through journals specific to your specialization	Use to <ul style="list-style-type: none">▪ Look for articles in a specific discipline▪ Do in-depth research on a particular topic▪ Look for articles on obscure or niche topics

Keywords Checklist

- Alternative vocabulary.
- American & British spellings.
- Common abbreviations or acronyms.
- What specific cases am I interested in.
- What more general terms might include my topic.
- Are there categories I would like to exclude.

Follow Citations

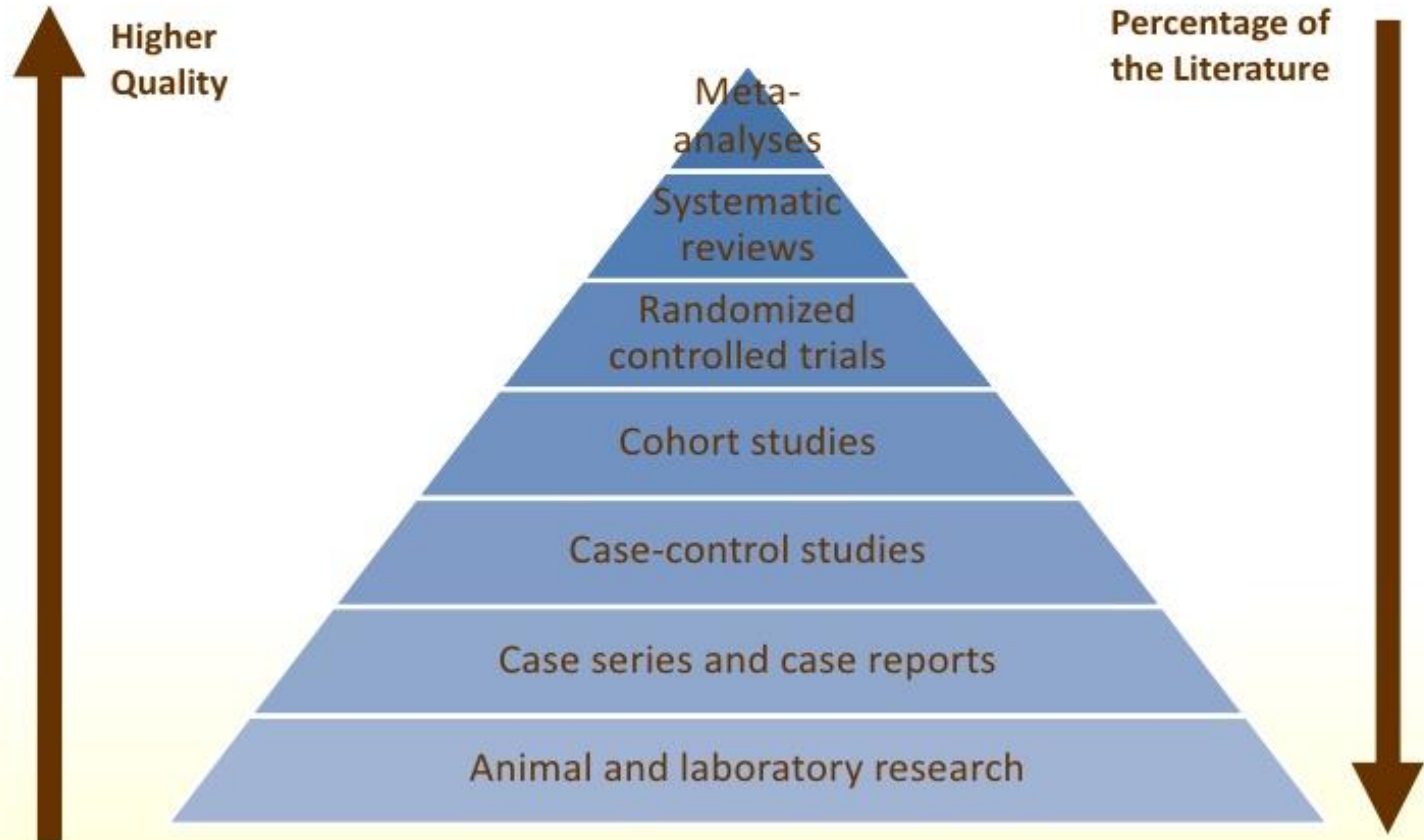
- Browse through the reference list of relevant articles to find more related articles (backward searching).
- Look at papers that have cited relevant articles since publication (forward searching).



Choosing the Right Evidence



Choosing Appropriate Evidence



Research Methods Defined

meta-analysis: a quantitative approach in which individual study findings addressing a common problem are statistically integrated and analyzed to determine the effectiveness of interventions.

systematic review: a process by which a body of literature is reviewed and assessed using systematic methods which are intended to reduce bias in the review process and improve understandability.

randomized controlled trial: an experiment in which investigators randomly allocate participants into (eg treatment and control) groups to receive or not to receive one or more interventions that are being compared.

cohort study: an observational study in which a cohort is followed over time.

case-control studies: retrospective research design that compares individuals with a specific condition to those without it.

case report: a detailed report of the symptoms, signs, diagnosis, treatment, and follow-up of an individual patient.

case series: a report on a series of patients with an outcome or condition of interest.

Understanding Different Types of Study Low-tech



Types of Study

- *Descriptive Studies* - lowest tech, least scientific, observational by their nature: no control group, no randomization, no hypothesis is tested.
- Descriptive studies do not answer specific questions or test hypothesis, they do have value in developing a basic understanding of EMS practices.

Types of Study

- *Quality Improvement Studies* - easiest & most common approach to EMS research. A factor which weakens this type of study is that the data is usually collected for another reason other than the study.
- Another factor is EMS providers are usually aware when something is being targeted for QI and therefore change their normal habits- ... "*the Hawthorne effect*"

Types of Study

- *Surveys & Questionnaires* - surveys can be effective, and they require few resources, down side is that they are subject to bias, "Hawthorne effect"

Mid - Tech Studies



Types of Study

- **Case Control** – two groups, one with a condition, one without and study outcomes, influenced by multiple variables
“ its like looking for a needle in a haystack, when there may not be a needle there at all”

Types of Study

- *Cross sectional studies* - snapshot of a population at a specific time, more sophisticated than a survey.
- *Cohort* - prospective, compare two or more groups of patients to see what effect different study factors have on their outcomes.

Types of Study

- *Randomized Controlled Trials (RTC's)* - highest- tech research, prospective, experimental cohort studies, double-blinded, placebo, eliminates bias
"Hawthorne" neither the researcher nor the patient or participants know which group is the intervention group.

Which Study ??

.... "There is no right answer when determining the type of study, the researcher has to balance all of the issues associated with the study design & choose the approach with the greatest level of success"!!



Record

- Keep a written record of your search terms.
- Note down names of journals or papers you come across often.
- Maintain a list of keywords and keyword combinations, so you will have a set of tried and tested keywords.

Reference Manager



- Use Endnote, Zotero or Refworks to download and manage papers.
- Allows you to download and save papers directly from journal websites.
- Easy to organise your library and compile reference lists



Keeping Up With The Literature





Alerts



- Large number of databases and publishers provide one or more of the following alert features: table of content alert (TOC), citation alert & keyword alerts.
- Extremely useful for keeping up with newly published papers & research topics.
- Alerts in the form of e-mails listing the title and the author of newly published papers and sometimes even abstracts.

How to keep up with new publications through alerts

- Journals that crop up regularly during searches
- Journals specific to your specialization
- Journals you would like to publish in

Sign up for TOC alerts through the journal websites

Get an email including table of contents whenever a new issue of the journal is published

- Journals that crop up regularly during searches
- Journals specific to your specialization
- Journals you would like to publish in

Sign up for keyword alerts with databases like Web of Science, Scopus, and Google Scholar

Get an email whenever a paper matching your keyword is published or added to the database

- Journals that crop up regularly during searches
- Journals specific to your specialization
- Journals you would like to publish in

Sign up for citation alerts through journal websites

Get an email whenever a newly published paper cites one of these studies

Summary

- Research - *the systematic process of collecting and analysing information*
- *Literature Search* - Analysis of prior research to identify Who, What, Where, Whys.
- Choose Right topic/ Right database / Right study/ Right evidence
- Record your search terms/keywords/citations
- Keep up with the latest with alerts

THE TRUTH IS OUT THERE

References

- *An Introduction to EMS Research, Brown L.H et al Published by Brady 2001*
- *Pre-hospital Research An Introduction, Falck Foundation, Venkataraman. A et al 2014.*
- *www.falckfoundation.com*



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Critical Appraisal Workshop

Ian Brennan
Emergency Medical Educator



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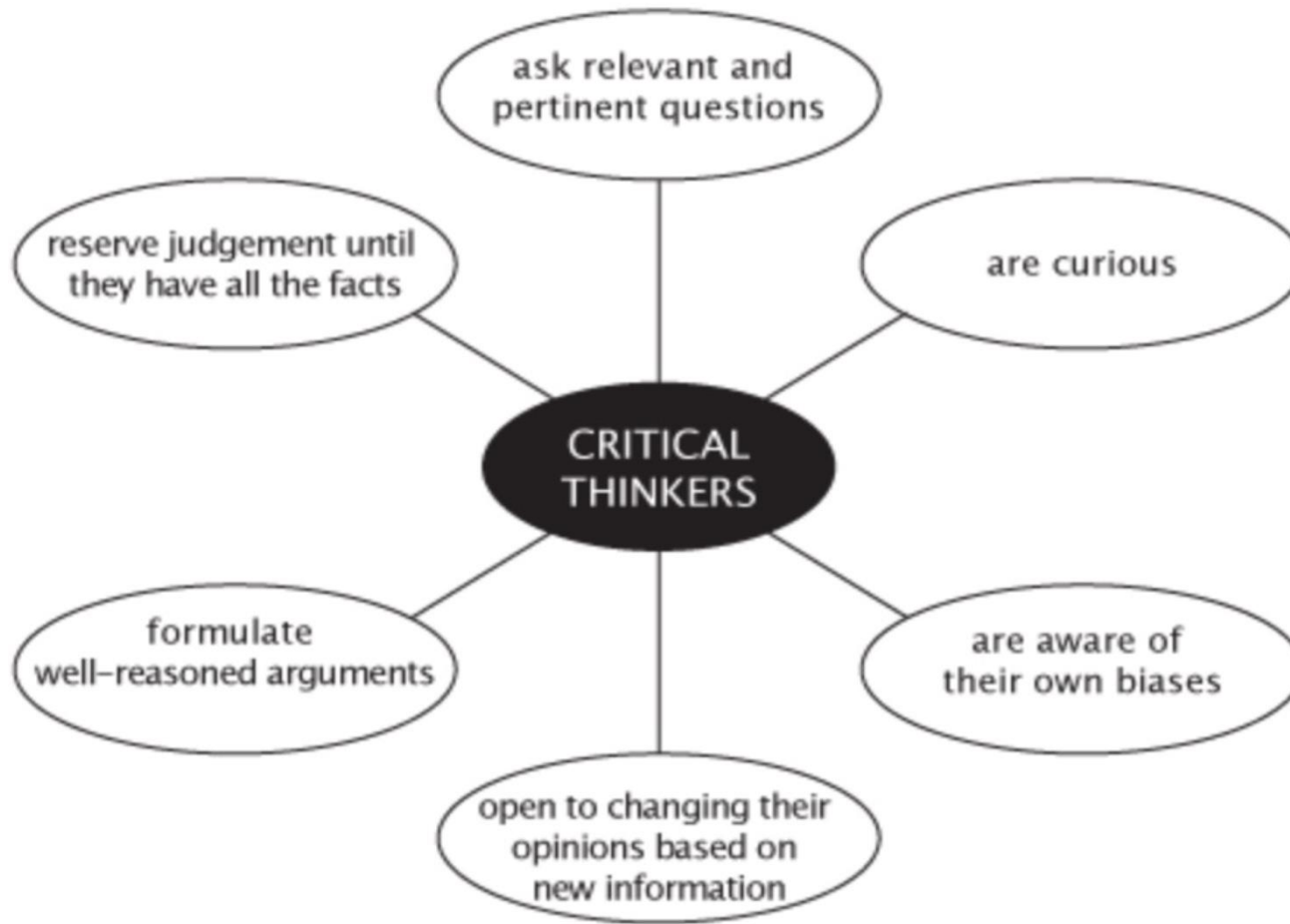
Overview

- <https://www.youtube.com/watch?v=AsD9Lp-q45Y>

Objectives

- Identify reliable sources of information
- Tips to help ensure journals/articles are reliable
- Review research questions for reliability
- Identify different study designs
- Identify results section of research paper
- Rate paper for overall usefulness

Critical Thinking



Group Work (1)

- Identify potential sources of medical information and discuss its reliability

Sources Of Information



- Newspapers
- Magazines
- Social Media
- Colleagues
- Journals



Journal Citations - Group work (2)

1. Access google scholar
2. Type in relevant prehospital term
3. Identify number of citations a journal article has got

Scholar

About 15,300 results (0.11 sec)

A randomized, double-blind study comparing morphine with fentanyl in **prehospital analgesia**

M Galinski, F Dolveck, SW Borron, L Tual... - The American journal of ..., 2005 - Elsevier

STUDY OBJECTIVE: The aim of this study was to compare, by a randomized double-blind method, morphine (M) and fentanyl (F) in a **prehospital** setting. METHODS: Consecutive patients with severe, acute pain defined as a visual analog scale score (VASS) of 60/100 ...

[Cited by 64](#) [Related articles](#) [All 9 versions](#) [Cite](#) [Save](#)

Prehospital analgesia with acupressure in victims of minor trauma: a prospective, randomized, double-blinded trial

A Kober, T Scheck, M Greher, F Lieba... - ... & **Analgesia**, 2002 - journals.lww.com

Abstract Untreated pain during the transportation of patients after minor trauma is a common problem in emergency medicine. Because paramedics usually are not allowed to perform invasive procedures or to give drugs for pain treatment, a noninvasive, nondrug-based ...

[Cited by 64](#) [Related articles](#) [All 14 versions](#) [Cite](#) [Save](#)

Journal Rankings - Group work (3)



1. Access journal ranking website
2. Find emergency medical journals
3. Note table of emergency medical journal ranking

				index	(2013)	(3years)	Refs.	(3years)	(3years)	(2years)	Doc.		
1	Resuscitation	j	Q1	2,491	89	433	1.185	9.487	3.618	748	4,18	21,91	
2	Annals of Emergency Medicine	j	Q1	1,726	104	409	1.121	5.486	2.038	637	2,94	13,41	
3	Academic Emergency Medicine	j	Q1	1,450	78	220	816	5.489	1.625	669	2,34	24,95	
4	Shock	j	Q1	1,373	83	210	629	5.736	1.603	545	2,86	27,31	
5	Prehospital Emergency Care	j	Q1	1,282	37	71	284	1.599	470	275	1,60	22,52	
6	Current Heart Failure Reports	j	Q1	1,051	17	53	116	3.859	263	105	2,51	72,81	
7	Congestive Heart Failure	j	Q1	1,026	27	58	196	1.552	385	167	2,24	26,76	
8	Injury	j	Q1	0,983	72	470	1.191	12.492	2.507	1.046	2,41	26,58	
9	Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine	j	Q1	0,926	16	92	232	2.484	484	206	2,18	27,00	
10	Critical care and resuscitation : journal of the Australasian Academy of Critical Care Medicine.	j	Q1	0,853	17	62	193	1.291	248	137	1,74	20,82	
11	Journal of Burn Care and Research	j	Q1	0,833	50	194	456	3.981	682	384	1,70	20,52	
12	Burns : journal of the International Society for Burn Injuries	j	Q1	0,759	63	361	747	7.192	1.215	624	1,79	19,92	
13	Emergency Radiology	j	Q1	0,678	25	91	246	1.931	321	237	1,30	21,22	
14	BMC Emergency Medicine	j	Q1	0,676	16	33	61	907	137	60	2,10	27,48	
15	Journal of Trauma Management and Outcomes	j	Q1	0,646	4	11	19	247	30	19	1,58	22,45	
16	Internal and Emergency Medicine	j	Q1	0,628	21	204	502	4.063	484	224	2,08	19,92	
17	American Journal of Emergency Medicine	j	Q1	0,592	56	688	1.251	9.306	1.381	1.042	1,22	13,53	
18	Prehospital and Disaster Medicine	j	Q1	0,574	27	128	300	1.205	273	237	0,99	9,41	
19	Journal of Emergency Medicine	i	Q2	0,561	51	683	1.347	8.796	1.344	1.029	1,21	12,88	

Research Question & Abstract

For a given research article answer the following questions

- Is it relevant?
- Is it applicable to me?
- Do I care about it?
- Is it clear?
- Too simple/complex?
- Does it appear reliable?

Types of study - Methodology

What way has the study been designed?

Who are the subjects?

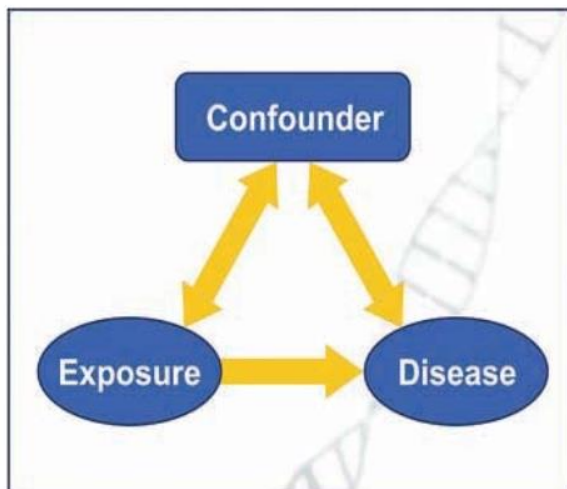
Are they representative?

Is it appropriate?

Has potential bias/errors been eliminated?

Are there any confounding factors?

Hierarchy of research



Hierarchy of research



Group work (4)

- Given some journal articles, identify the research methodologies

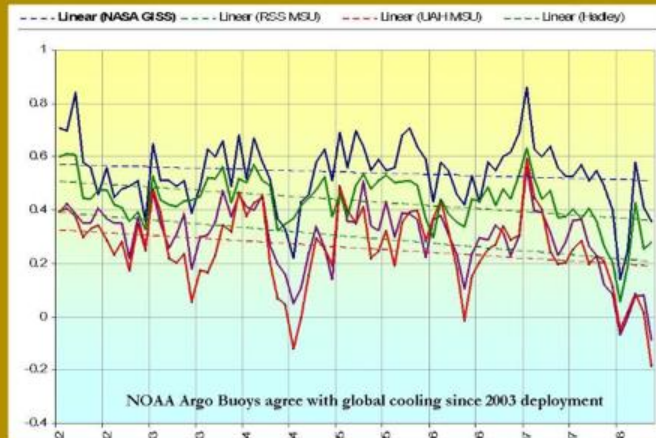
Results

Are they clear?

Are graphs/figures clear?

How are the results presented?

Are the results clinically significant?



Discussion & Conclusions

- Is the discussion balanced?
- Are the limitations outlined?
- Does the data answer the question?
 - Are the references up to date?
 - Is there any conflict of interest?
 - Is there a source of funding?

Summary

Always think critically!

Review research abstracts for usefulness



**KEEP
CALM
AND
QUESTION
EVERYTHING**

Next steps & further reading

Attend a critical appraisal workshop
Join a journal club

