

# **Dokumentation: Science Market Place**

## **8. Wiener Internationaler & 45. Österreichischer Geriatriekongress**

**in Kooperation mit dem  
Forschungskolleg Geriatrie  
der Robert-Bosch-Stiftung**

**20.–23. April 2005**

### **Teil 1: Planen und Publizieren von wissenschaftlichen Arbeiten (Mentoren)**

How to write a scientific paper? (Prof. C. Sieber)	2
Projekte – Vorbereitung, Strukturierung, Einreichung (Prof. A. Stuck)	7
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Qualitätsbeurteilung wissenschaftlicher Arbeiten (Prof. L. Pientka)	16

# How to write a Scientific paper

Cornel Sieber, Nürnberg-Erlangen, D

## How to write a scientific paper

50 years of Austrian Society of  
Geriatrics and Gerontology  
Vienna, May 23, 2005

Cornel Christian Sieber  
Friedrich-Alexander-Universität Erlangen-Nürnberg  
Institut für Biomedizin des Alterns  
Zentrum für Altersmedizin, Klinikum Nürnberg

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## Aufbau der Publikation - 1

- Abstract
- Introduction
- Material and Methods
- Results
- Discussion

4

## Planung der Studie - 1

- Was ist meine Hypothese ?
- Was bedeutet es, wenn diese
  - Bestätigt
  - Nicht bestätigt
  - Indifferentheraus kommt

2

## Aufbau der Publikation - 2

- References
- Tables
- Figures
- ...
- Cover letter, Reviewers

5

## Planung der Studie - 2

- In was für einen Kontext passt die Hypothese ?
- Dies hilft mir zu entscheiden, an wen sich die Arbeit richtet – Wahl des Journals

3

## Abstract

- The shorter, the better
- Letzte zwei Sätze (Summary und Conclusion) essentiell
- Nicht mehr als 250 Wörter
- „Repetitiv“ durchlesen

6

## Introduction

- Einige Sätze Einführung (weshalb.., Rationale)
- Wie sieht die Datenlage aus
- Wo füllen wir die „Löcher“
- Wie machen wir dies

7

## Discussion - 1

- Nochmals 1-2 Sätze Einführung
- Einzelne Findings mit der Literatur konzis und kritisch vergleichen
- Pro Finding immer auch den Zusatzgewinn der eigenen Studie aufzeigen

10

## Materials and Methods

- Personen – Kollektiv
- Study design (Studienaufbau klar beschreiben - ev. Tabelle)
- Methodologie - Technik
- Statistik

8

## Discussion - 2

- Ein Abschnitt mit Selbstkritik (design, open questions...)
- Summary und Conclusions mache ich gerne etwas breit
  - Eventuell mit „bullet points“

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## Results

- Klar aufbauen
- Alles beschreiben – nur Querverweis auf Tables and Figures
- Nebst Tabellen im Text auch hier Zahlen, 95% CI...angeben

9

## References

- „Hot shots“ - eventuell auch avisiertes Journal - zitieren (Narzismus der Reviewer)
- Sich selbst zitieren, aber nur mit relevanten papers
- Wenig Review articles nehmen
- 1-2 Artikel aus laufendem Jahr
- Zahl 25 nicht überschreiten!

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## Tables

- Nicht überladen – keine „my god“ Tabellen !
- Legende separat schicken
- Muss immer selbsterklärend sein – also nie Bedarf, ins Paper selbst zurück zu gehen...

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## Wahl des Journals

- Zielpublikum
  - Forschungsgemeinde
  - Standespolitik (lokal, international)
  - Sprache (Deutsch, Englisch...)
- Impact factors (IF) sind nicht Alles, wenngleich wichtig für Habilitation...

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## Figures

- Trennt Spreu vom Weizen
- Werden „eingescannt“ – persönlich, später...
- X- und Y-Achsen gut wählen
- Quintessenz muss in wenigen Sekunden klar erkennbar sein
- Legende – siehe Tables

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## Wahl des Journals - 1

	IF	cited T/2 (y)
--	----	---------------

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## Schreiben des papers

- Wie gehe ich selbst vor ?
  - Abstract (hilft mir zu priorisieren)
  - Introduction (stream-lining)
  - Materials and Methods
  - Diskussion und Resultate wechselseitig (finde „Results“ langweilig zum schreiben)
  - References kontinuierlich (cut and paste)

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## Wahl des Journals - 2

	IF	cited T/2 (y)
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18

### Wahl des Journals - 3

- Z Gerontol Geriatr 0.43
- Eur J Geriatrics
- Geriatrie Journal
- Geriatrie Praxis
- .. Auch wichtig für Fach und „Ego“

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### „How to deal with reviewers comments... - 3

- Gibt Reviewer neue Ideen ?
- Wenn ja, eventuell ganzes Paper umschreiben – eventuell sogar „splitten“ – und anderweitig einsenden

22

### „How to deal with reviewers comments... - 1

- Accepted
  - Be happy
- Accepted with minor revisions
  - Just do them
- Accepted with major revisions
  - ...
- Rejected
  - Ask for reviews

20

### „How to deal with reviewers comments... -

- Wie erkenne ich einen „nasty“ Reviewer ?
  - Hinterfragt ungerechtfertigt ganze Statistik
  - Möchte N erhöhen
  - Nörgelt stark an „lay-out“ herum

23

### „How to deal with reviewers comments... - 2

- Accepted with major revisions
  - Wie rasch sollte die Arbeit publiziert werden ?
  - Was meinen die Koautoren ?
  - Ist der Reviewer mir/uns primär gut gesinnt ?

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### Unbedingt vermeiden

- Statistik tricken
- Abschreiben (Textbausteine)
- Einmal ist immer!

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# Projekte – Vorbereitung, Strukturierung, Einreichung

Andreas Stuck, Bern, CH

8. Wiener Internationaler  
Geriatrykongress 2005

## Research Projects - Preparation, Structure, Grant Submission: Planning a controlled trial of an intervention in older persons

Andreas E. Stuck  
Geriatric Universität Bern  
SPITAL BERN-ZIEGLER, BERN

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## 2. Conducting a literature review

- > 1. Is there a systematic analysis on this topic?
- > 2. Search for original publications
  - Definition of study inclusion criteria (e.g. study population, type of intervention, study design)
  - Searching the right databases
  - Definition of the requested information
- > 3. Search for ongoing studies
  - abstracts
  - ask experts in the field
  - in future: consult trial register

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## An example

### Research Idea:

**I would like to test the effect of a novel hip protector on hip fracture prevention in older persons**

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## 3. Definition of the intervention to be tested

- > Definition of the intervention protocol for persons in intervention group
- > Definition of the protocol for persons in the control group
- > How to deal with noncompliance
- > How to measure intervention process data (qualitative and quantitative)

5

## 1. Asking the research question

- > 1. What is the research question
- > 2. What are the possible answers from the planned study?
- > 3. What is new about the possible answers?
- > 4. What is the relevance of the possible answers?

3

## 4. Choice of the outcome measure

- > Definition of primary and secondary outcomes
  - conceptual vs. operational definition
  - data sources
- > Validity of the information
- > Dealing with drop-out, missing data
- > Blinding of outcome evaluation

6

### 5. Selection of the study population

- > What population?
- > Eligibility criteria:
  - definition of inclusion/ exclusion criteria criteria (group to which results should be generalisable)
- > Quantitative description of selection process (required description of sample)

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### 7. Sample size calculation

- > Primary hypothesis
- > Control group event rate
- > Clinically relevant effect
- > required alpha (5%, two sided)
- > required power (1-beta, 80%)

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### 5. Selection of the study population: CONSORT guidelines

- > CONSolidated Standards of Reporting Trials
- > enrollment (eligibility, inclusion criteria, refused, randomized)
- > allocation (to group, numbers receiving intervention)
- > follow-up (no information for outcome data, discontinued intervention)
- > analysis (excluded from analysis)

8

### 8. Ethical issues

- > Does intervention have unacceptable risks?
- > Is patient informed consent obtained/ does informed consent meet criteria?
- > Is usual care of control group acceptable?
- > Does the study have an adequate power to answer the study question?

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### 6. Choosing the method of randomisation

- > Unit of randomisation
  - individual person
  - household
  - cluster randomisation (e.g. physician practice)
- > Blinding of the randomisation
  - The study personnel has no possibility to influence the allocation of persons to intervention / control groups (third party assignment)

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### 8. Ethical issues: Informed consent in persons with cognitive impairment

Difficulty for obtaining informed consent:

- > People with mild-moderate AD (MMSE 16-28) can distinguish between trial protocols of varying risk/benefit ratios (Scott et al. Am J Psychiatry 2002;159:797-802)
- > Competency assessments suggest people with MMSE<18 lack capacity to consent (Pucci et al. Alzheimer Dis Assoc Disord 2001;15:146-154)

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### 9. Reconsider the study design

- Is it appropriate to plan a randomised controlled study?

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### Exploratory trial: Phase II

Evidence can be obtained to support the theoretically expected treatment effect, to identify an appropriate control group, outcome measures, estimates of recruitment for a main trial, and other requirements of such a trial (e.g., identify the optimal dose of the intervention).

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### 8. Reconsider the study design: The MRC guidelines

Theory: Pre-clinical  
Modelling: Phase I  
Exploratory trial: Phase II  
Definitive RCT: Phase III  
Long-term implementation: Phase IV  
A FRAMEWORK FOR DEVELOPMENT AND  
EVALUATION OF RCTs FOR COMPLEX  
INTERVENTIONS TO IMPROVE HEALTH  
(MRC London, April 2000)  
[http://www.mrc.ac.uk/pdf-mrc\\_cpr.pdf](http://www.mrc.ac.uk/pdf-mrc_cpr.pdf)

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### Definitive RCT: Phase III

Central step in the evaluation of a complex intervention is the main randomised controlled trial to evaluate a complex intervention and requires attention to standard issues of adequate power, adequate randomisation and blinding (where feasible), appropriate outcomes measures, informed consent of participants (...).

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### Modelling phase: phase I

- > develop an understanding of your intervention and its possible effects
- > methods: for example, computer simulations, or economic modeling. It may also include qualitative testing through focus groups, preliminary surveys, case

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### Long-term implementation: Phase IV

- > The final step in the evaluation of a complex intervention is a separate study to establish the long-term and real-life effectiveness of the intervention. The broader applicability of an intervention outside of a research context may be tested and rare or long term adverse events identified. This stage is likely to involve an observational study.

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**10. How to submit a grant proposal**  
**Traits of a successful grant getter**

- Good research skills
- Salesmanship skill (convince: idea is worth funding)
- Communication skill (writing and speaking)
- Ingenuity/flexibility (take advantage of opportunities)
- Administrative skills
- Good human relations (staff, funding agency)
- Persistence, dedication, patience
- Political awareness
- Integrity

(Grant Application Writer's Handbook, Reif-Lehrer L.)

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**Summary: 10 points**

- > 1. Asking the research question
- > 2. Conducting a literature review
- > 3. Definition of the intervention to be tested
- > 4. Choice of the outcome measure(s)
- > 5. Selection of the study population
- > 6. Choosing the method of randomisation
- > 7. Sample size calculation
- > 8. Reconsider the study design
- > 9. Ethical issues
- > 10. How to submit a grant proposal

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**10. How to submit grant proposal**  
**Proposals that will fly**

- > Well-focused, well-written proposal
- > Track record in the proposed area of research
- > Being prepared to devote a substantial effort
- > Maintaining a stable work group
- > Publication list

(Grant Application Writer's Handbook, Reif-Lehrer L.)

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# How to find the right Literature?

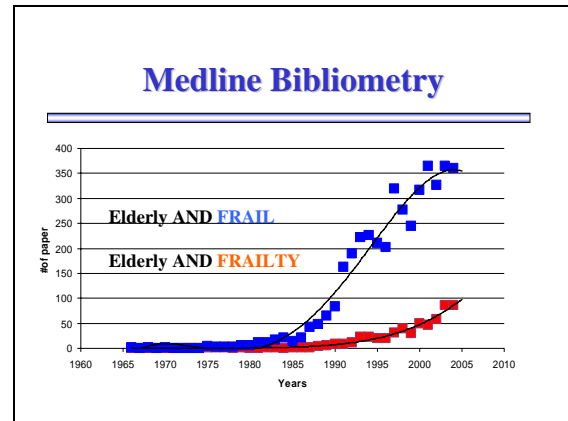
Francois Herrmann, Genf, CH

**How to find the right literature**

PD Dr. F. R. Herrmann, MD MPH  
Département de Réhabilitation et Gériatrie  
Geneva, Switzerland



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4

**Searching the litterature**

- **Why**
- **Since when (History)**
- **How it works**
- **How to search (Strategy & demo)**
- **How to select a Journal for publication**
- **When to search**

2

**Why: Information validity**

- Many journals propose only paper summaries
- Major breaktrough are published in a limited number of journals
- Only a few published papers will carry an important and long lasting scientific message (<http://www.isinet.com>)

5

**Why: Information overload**

- 100'000 scientific journals in 1990
- 4'000 medical journals issued each month
- For specific topic: very large number of papers

3

**Why: Clinical uncertainty**

Need to know the best ways to

- Diagnose
- Treat
- Care

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## Why to search?

### To retrieve medical information to

- check for evidence-based answers to clinical questions
- prepare a research proposal
- prepare scientific communications

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## National library of medicine (NLM)

« The wealth of new medical information issuing from research centers around the world cannot be used to improve our health and cure disease unless it is made available rapidly to the entire health science community. »

Donald A. B. Lindberg, M.D.  
Director of the NLM



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## Why to search?

### To retrieve medical information to

- keep up to date
- check a C.V.
- discover new knowledge (KDD knowledge discovery in databases)\*

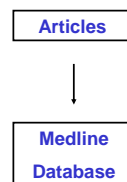
\*Swanson DR. Medical literature as a potential source of new knowledge. Bull Med Libr Assoc 1990;78(1):29-37.

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## How it works (data in)

### Librarians

- Read the papers
- Index them using keywords from MESH = ME<sup>dical</sup> S<sup>ubjects</sup> H<sup>eading</sup>s
- Feed information in Medline



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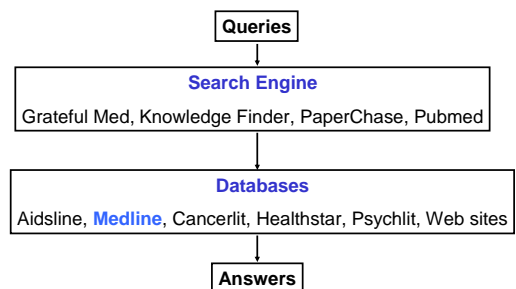
## Since when (History of NLM)

- 1956** Act of Congress moved Armed Forces Medical Library to Public Health Service (PHS) as the NLM.
- 1964** Medical Literature Analysis and Retrieval System
- 1971** MEDLINE ("MEDLARS Online")
- 1986** Grateful Med, PC-based access to MEDLARS
- 1992** World Wide Web
- 1997 June 26** PUBMED: Free Web-based access to NLM's MEDLINE



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## How it works (data out)



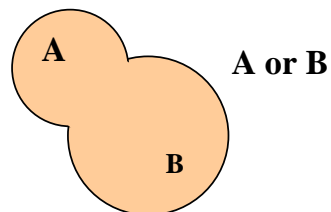
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## How to search - Strategy

- Analyze your topic to decide where to begin
  - State the question
  - Identify its components
  - Identify key concepts which translate into keywords
- Query databases
  - Use Boolean techniques on your query

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## Boolean OR



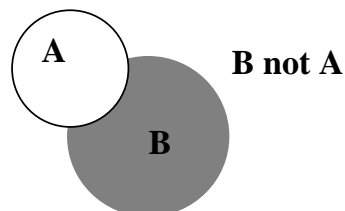
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## How to query

- **Key-Words** (MeSH = MEdical Subjects Headings)
- **Boolean operators**
  - AND
  - OR
  - NOT
- **Other tricks**
  - NEAR
  - Restriction
  - Localization (titre, abstract...)

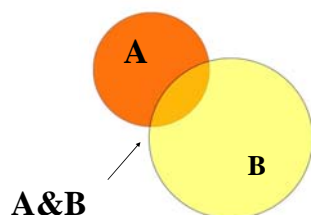
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## Boolean NOT



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## Boolean AND



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## How to search - Strategy

- Learn as you go and vary your approach based on the information retrieved
- **Store your queries**
- Read title, abstract and full papers
- Select relevant papers
- Check the key-words of relevant papers
- Summarize you findings
- **Store your results**

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## How to search - Strategy

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- **Do you want**
  - All papers on a topic
  - Quick but partial answer
- **Sensitivity versus specificity**
  - **sensitivity**: all papers, with many "false positive" (identify non relevant papers)
  - **specificity**: few hits, with "false negative" (miss relevant papers)

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<http://pubmed>  
<http://www.ncbi.nlm.nih.gov/>

22

## How to search - Strategy

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- **Sensitive:**
  - Many OR and few AND or NOT
  - You get many hits
- **Specific:**
  - Many AND or NOT
  - You get few papers, but very focused

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<http://www.paperchase.com/>

Horowitz GL, Bleich HL (1981).  
« PaperChase: a computer program to search the medical literature. »  
N Engl J Med **305**(16): 924-30.

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## How to search - Demo

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### Search engines / interfaces to Medline

- Pubmed
- PaperChase
- EndNote - Procite - Reference manager

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## How to select journals for publication

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### Strategy

1. Make sure you select a journal that has already published papers on your topic
2. Do a Medline search on your topic
3. Sort your hits by journals
4. Check the impact factor (IF)  
<http://www.isinet.com>

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## Journal Impact Factor

Measure of the frequency with which the *average article* in a journal has been cited in a particular year.

The impact factor helps you evaluate a journal's relative importance, especially when you compare it to others in the same field.

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## Journal Selection for publication

### Strategy

1. Make sure you select a journal that has already published papers on your topic
2. Do a Medline search on your topic
3. Sort your hits by journals
4. Check the impact factor (IF)  
<http://www.isinet.com>
5. Check instructions to authors  
<http://mulford.mco.edu/instr/>

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## Impact Factor 2004 calculation

Number of citations in the current year (2004) to articles published in the two previous years (2002 + 2003)

Total number of articles published in the two previous years (2002 + 2003).

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## THM: When to search

- Answer a clinical question
- Define a research question
- Write a research protocol
- Write a paper
- Review a paper
- Prepare a presentation

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## Impact Factor 2004 calculation

Cites in 2004 to articles published in 2002 = 10  
2003 = 20  
Sum 30

Number of articles published in 2002 = 43  
2003 = 40  
Sum 83

$$IF_{2004} = \frac{\text{Cites to RA}}{\text{Number of RA}} = \frac{30}{83} = 0.361$$

IF<sub>2004</sub> will be available in summer 2005

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## THM

- Know what you are looking for
- Define your query (subject, MESH, author...)
- Run your query
- Select and keep the information (query & results)
- Use the collected informations
- Transmit the results

30

## Useful web sites

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### List of web accessible medical journal

[http://www3.mdanderson.org/library/online\\_journals/jrnls.html](http://www3.mdanderson.org/library/online_journals/jrnls.html)

<http://www.freemedicaljournals.com/>

[http://was.usc.edu/eresources/isd/lists/sub\\_080.php](http://was.usc.edu/eresources/isd/lists/sub_080.php)

<http://findit.library.miami.edu/ejournals.php>

# Qualitätsbeurteilung wissenschaftlicher Arbeiten

Ludger Pientka, Herne, D

**Qualitätskriterien für wissenschaftlicher Arbeiten**

Ludger Pientka  
Klinik für Altersmedizin und Frührehabilitation  
Ruhr-Universität Bochum  
Marienhospital-Herne

1

**Fragestellung - Hypothese**

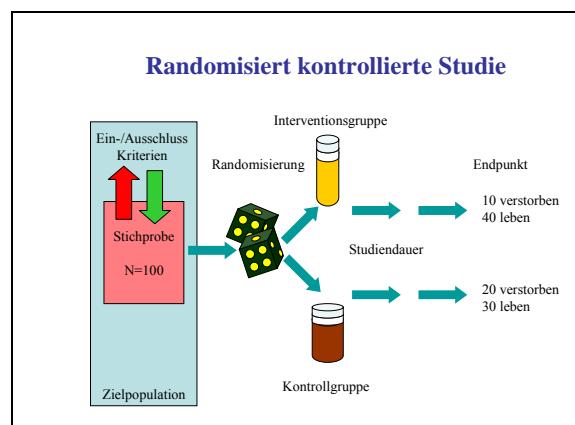
Kölsch verlängert das Leben.

4

**Ausgangslage**

Forschung an Mäusen hat ergeben, dass Kölsch trinkende Mäuse länger leben als Alt trinkende.  
Also trinken wir jetzt alle Kölsch?

2

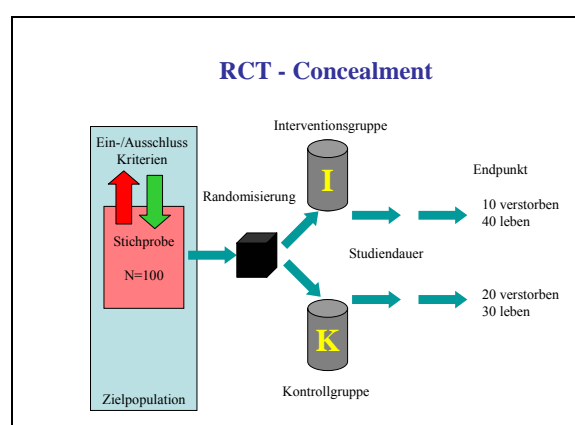


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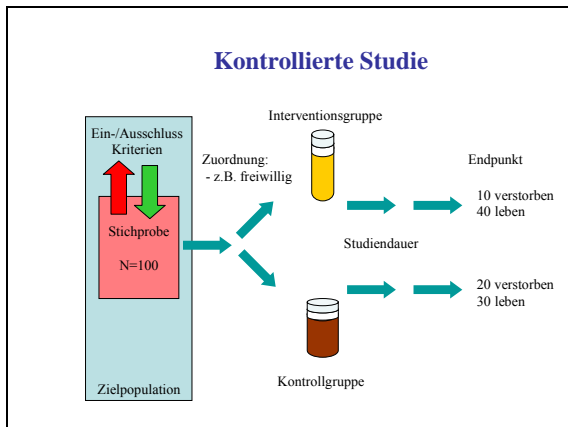
**Mögliche Szenarien zur Überprüfung**

- Randomisiert kontrollierte Studie
- Kontrollierte Studie
- Kohortenstudie
- Fall-Kontrollstudie

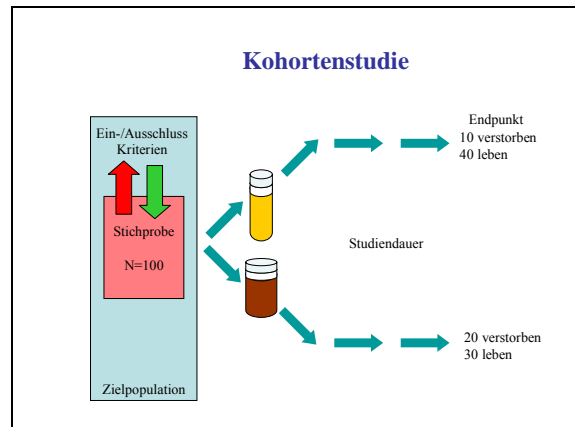
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### Probleme in Therapiestudien (RCT)

- Vergleichsgruppe
  - Finden wir genügend Freiwillige für unsere Studie, oder stellen die Freiwilligen eine Selektion dar?
- Randomisierung
  - Ist die Randomisierung verborgen und für den Randomisierenden und Randomisierten nicht vorhersehbar
- Verblindung
  - Erfolgt die Verblindung und welche Qualität hat die Verblindung (Nur schwarzer Becher oder auch Nasenklammer?)
- Compliance
  - Ist eine Compliance in der Studie und später zu erwarten
- Ergebnisbewertung

8

### Vor- und Nachteile von Kohortenstudien

<p><b>Vorteile</b></p> <ul style="list-style-type: none"> <li>• Einzige Möglichkeit der direkten Inzidenzberechnung</li> <li>• Analogie zur klinischen Fragestellung: Exposition ⇒ Krankheit</li> <li>• Kann den Zusammenhang einer Vielzahl von Krankheiten und Exposition nachweisen</li> </ul>	<p><b>Nachteile</b></p> <ul style="list-style-type: none"> <li>• Ineffektiv, da viel mehr Personen eingeschlossen werden als die Krankheit entwickeln</li> <li>• Lange Studiendauer</li> <li>• Teures Studiendesign</li> <li>• Weist nur für vorher definierte Faktoren den Zusammenhang nach</li> <li>• Mögliches Confounding</li> </ul>
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### Randomised controlled trials

SECTION 1: INTERNAL VALIDITY			
In a well conducted RCT study...		In this study this criterion is:	
1.1	The study addresses an appropriate and clearly focused question.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
7.2	The assignment of subjects to treatment groups is randomised	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.3	An adequate concealment method is used	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.4	Subjects and investigators are kept 'blind' about treatment allocation	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.5	The treatment and control groups are similar at the start of the trial	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable

Scottish Intercollegiate Guidelines Network, March 2004

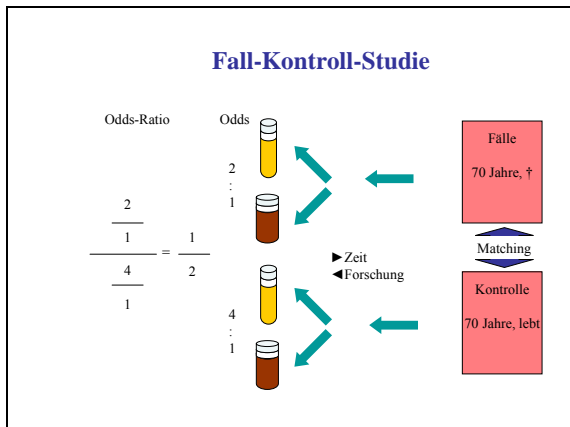
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### Cohort studies

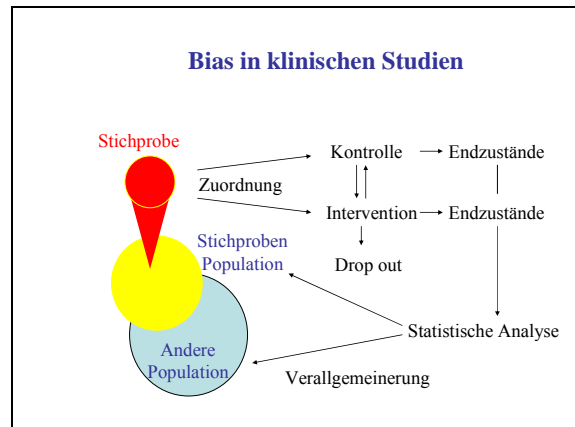
SECTION 1: INTERNAL VALIDITY			
In a well conducted cohort study:		In this study the criterion is:	
1.1	The study addresses an appropriate and clearly focused question.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
<b>SELECTION OF SUBJECTS</b>			
1.2	The two groups being studied are selected from source populations that are comparable in all respects other than the factor under investigation.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.3	The study indicates how many of the people asked to take part did so, in each of the groups being studied.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.4	The likelihood that some eligible subjects might have the outcome of the time of enrolment is assessed and taken into account in the analysis.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.5	What percentage of individuals or clusters recruited into each arm of the study dropped out before the study was completed.		
1.6	Comparison is made between full participants and those lost to follow up, by exposure status.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable

Scottish Intercollegiate Guidelines Network, March 2004

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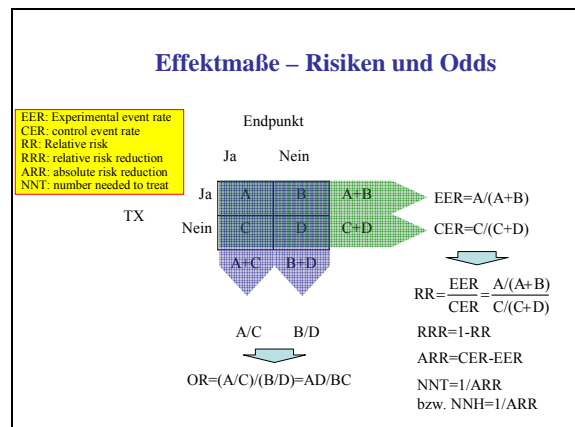


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### Vor- und Nachteile von Fall-Kontroll-Studien

Vorteile	Nachteile
<p>Einzigste Möglichkeit der Zusammenhangsberechnung für seltene Erkrankungen</p> <p>Preiswertes Studiendesign</p> <p>Schnelle Verfügbarkeit der Ergebnisse</p>	<p>Hohe Anfälligkeit für Verzerrungen</p> <p>Schwieriges Matching</p>

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### Case-control studies

SECTION 5. INTERNAL VALIDITY	
Is an well considered case-control study?	Is this study the criterion is
5.1 The study addresses an appropriate and clearly focused question	Well covered Adequately addressed Partly addressed Not covered Not applicable
<b>SELECTION OF SUBJECTS</b>	
5.2 The cases and controls are taken from comparable populations	Well covered Adequately addressed Partly addressed Not covered Not applicable
5.3 The same exclusion criteria are used for both cases and controls	Well covered Adequately addressed Partly addressed Not covered Not applicable
5.4 What percentage of new group cases and controls participated in the study?	Cases Controls
5.5 Comparison is made between participants and non-participants to establish these similarities or differences	Well covered Adequately addressed Partly addressed Not covered Not applicable
5.6 Cases are clearly defined and differentiated from controls	Well covered Adequately addressed Partly addressed Not covered Not applicable
5.7 It is clearly established that controls are non-cases	Well covered Adequately addressed Partly addressed Not covered Not applicable

Scottish Intercollegiate Guidelines Network, March 2004

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### Studien sind teuer

- Sie sind Besitzer einer großen Brauerei, die Weissbier braut und glauben, dass Weissbier noch besser als Kölsch wirkt. Aus ersten Versuchen mit Mäusen wissen Sie, dass die Mortalität unter Weissbier gegenüber Kölsch um 25% sinkt. Sie wollen in Ihrer Studie nicht unnötig Geld verschwenden und unnötig viele Probanden (=keine zahlenden Kunden) einschließen. Andererseits möchten Sie sich auch nicht dem Spott der Kölner aussetzen, dass Ihr Bier nicht besser sei und höchstens 10% falsch negative Studien akzeptieren.

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## Studienplanung

- Mortalität Kölsch 20%
- Gemutmaßte Mortalität Weissbier 15%
- Alpha = 0,05
- Beta = 0,1
- Power = 0,9

Probability of event in control group = 0,2  
Probability of event in experimental group = 0,15

### **For uncorrected chi-square test:**

N = 1212 case subjects and 1212 controls

### **For corrected chi-square and Fisher's exact tests:**

N = 1252 case subjects and 1252 controls

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## Die Studie gibt es nie

Wer möchte schon alle potentiellen Kunden kostenlos  
versorgen?

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