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Reviewing Evidence – the usefulness and limits of various approaches

SYSTEMATIC REVIEWS

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Funded by the Public Health Agency of Canada
Affiliated with McMaster University

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Systematic Reviews

- What are they?
- Why do them?
- What is the process?
- What are the limits?



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What is a Systematic Review?

- A specific, rigorous and reproducible summary of all the researched evidence that relates to a specific question.



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Evidence of Gap

- Consistent evidence of failure to translate research findings into clinical practice
 - 30-40% patients do not get treatments of proven effectiveness
 - 20-25% patients get care that is not needed or potentially harmful

Schuster, McGlynn, Brook (1998). *Milbank Memorial Quarterly*. Grol, R. (2001). *Med Care*



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Evidence-Informed Public Health



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Why do Systematic Reviews?

- Amount of evidence available
- Conflicting results
- Time
- Critical appraisal skills of practitioners, policy-/decision-makers
- Responsible use of resources –

What do we know?

What is the next step for research?

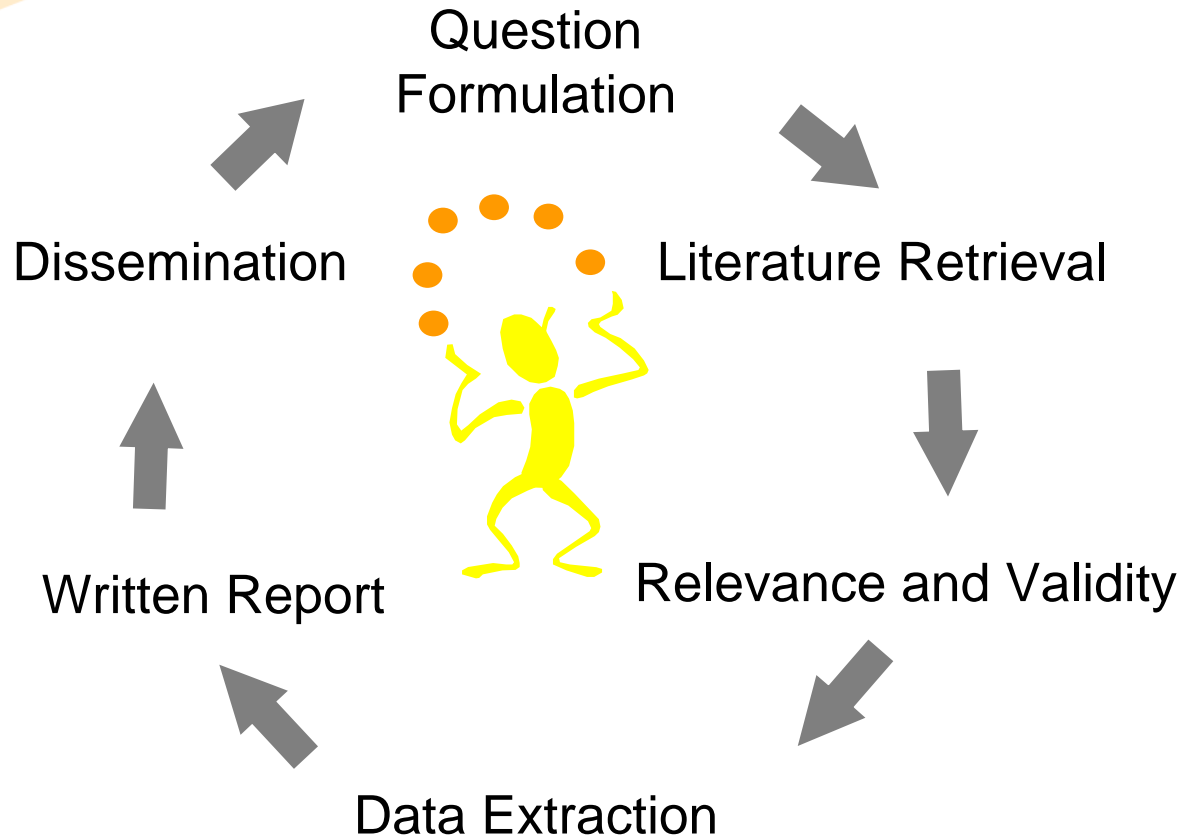


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Steps in a Systematic Review

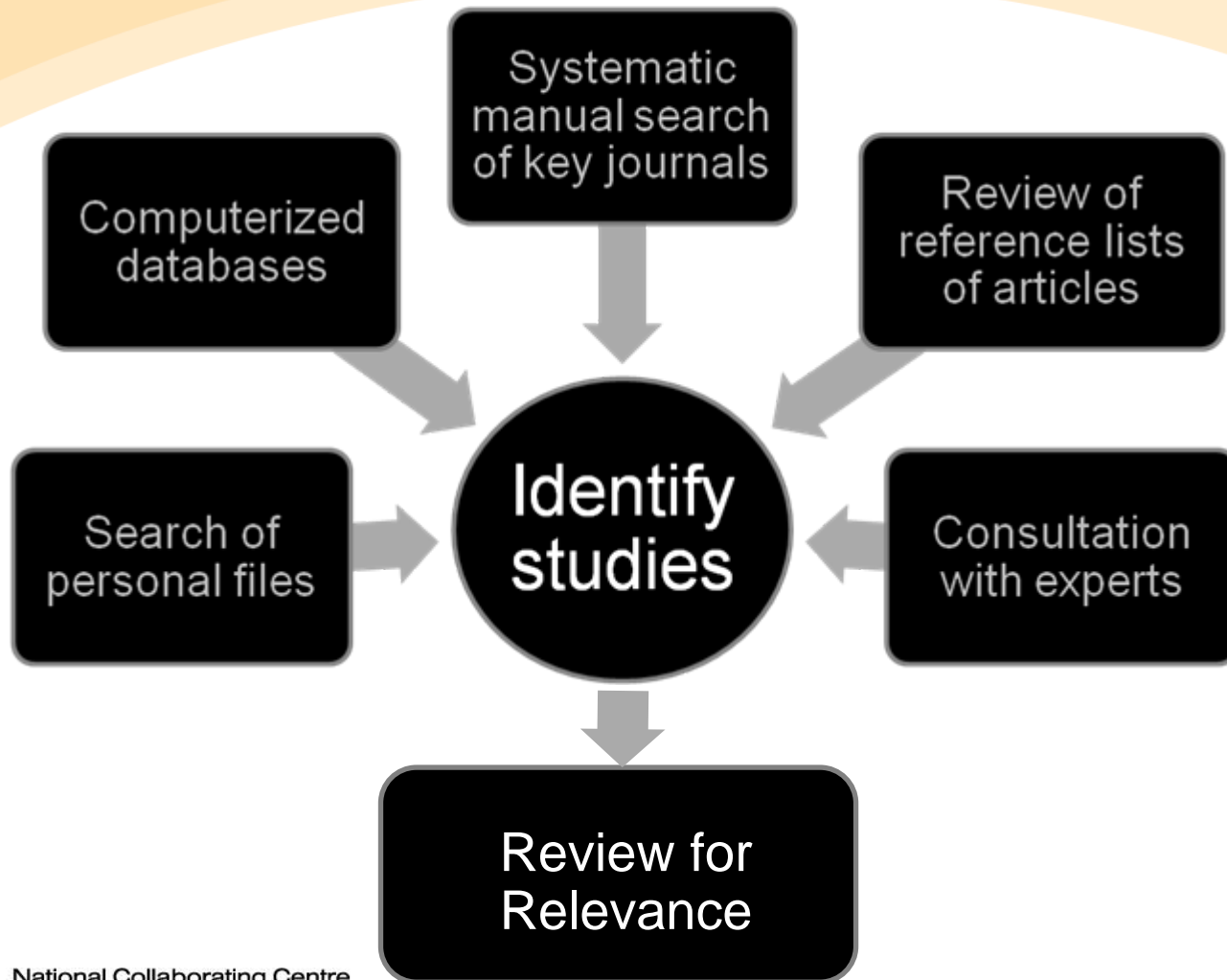


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Steps in a Systematic Review

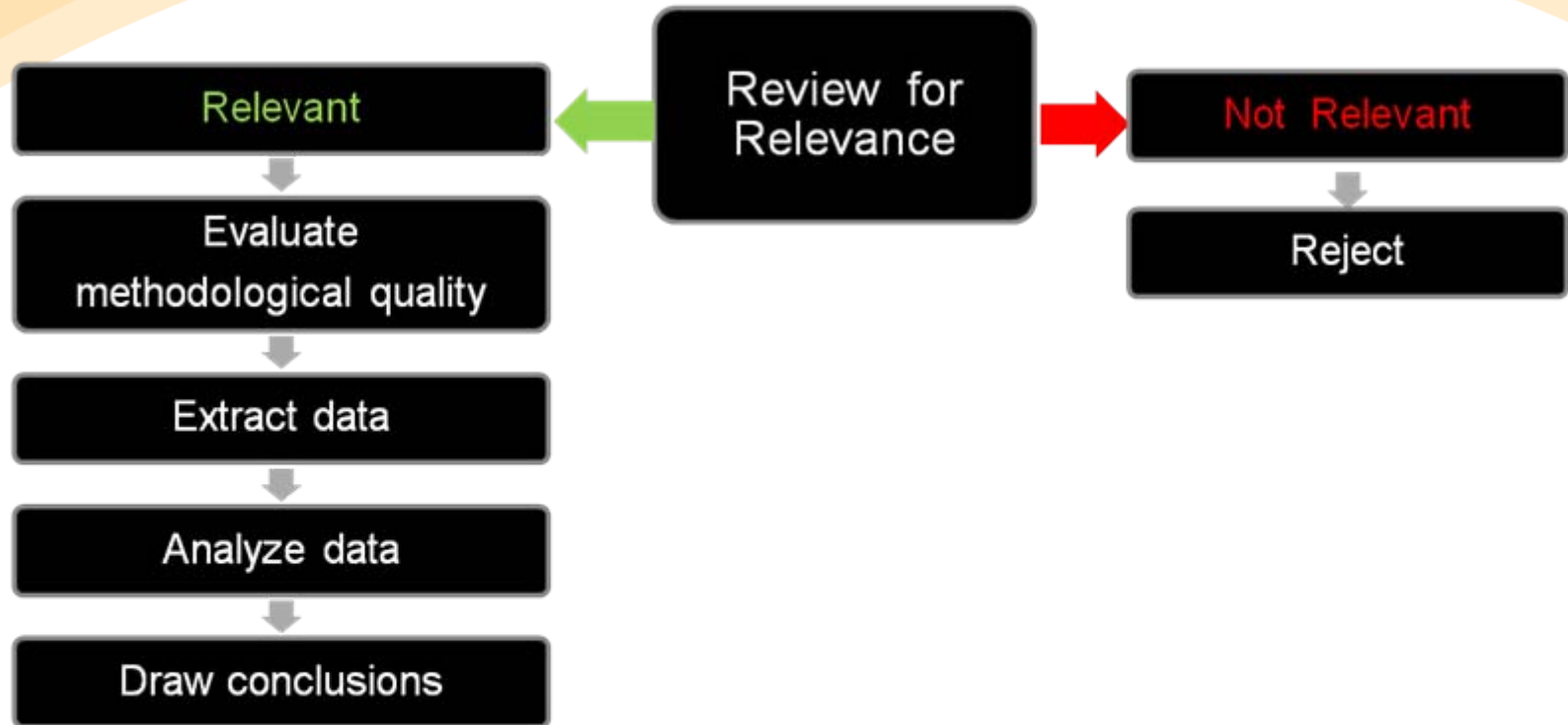


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Steps in a Systematic Review



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Types of Reviews

- Narrative
- Integrative
- Systematic
- Scoping
- Meta-analysis
- Meta-synthesis
- Realist
- Rapid
- Health Technology Assessment



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Topics for Review

- Effectiveness
- Harm
- Prognosis
- Diagnostic and screening tests
- Cost-Effectiveness



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Relevance Criteria for Study Selection

- P** participants
- I(E)** intervention (exposure)
- C** comparison group
- O** outcome(s)



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Process of Searching for Articles

- Electronic databases
- Bibliographies of selected articles
- Hand searching journals
- “Grey” literature
- Key informants
- Web searching



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Quality Assessment of Primary Studies

- Selection bias
- Allocation bias
- Confounders
- Blinding
- Data collection methods
- Withdrawals and drop-outs
- Analysis
- Intervention integrity



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Data Extraction and Synthesis

- Narrative Vs meta-analysis
- Clinical heterogeneity
- Multiple outcomes
- Availability of data



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What is a Meta-Analysis?

- Combines the results of similar studies quantitatively.
- Produces a summary statistic that represents the effect of the intervention (from several different studies combined).
- Summary statistic is more precise than the effect size from individual studies
- Meta-analysis should only proceed from systematic reviews, but not all systematic reviews should be meta-analyses!



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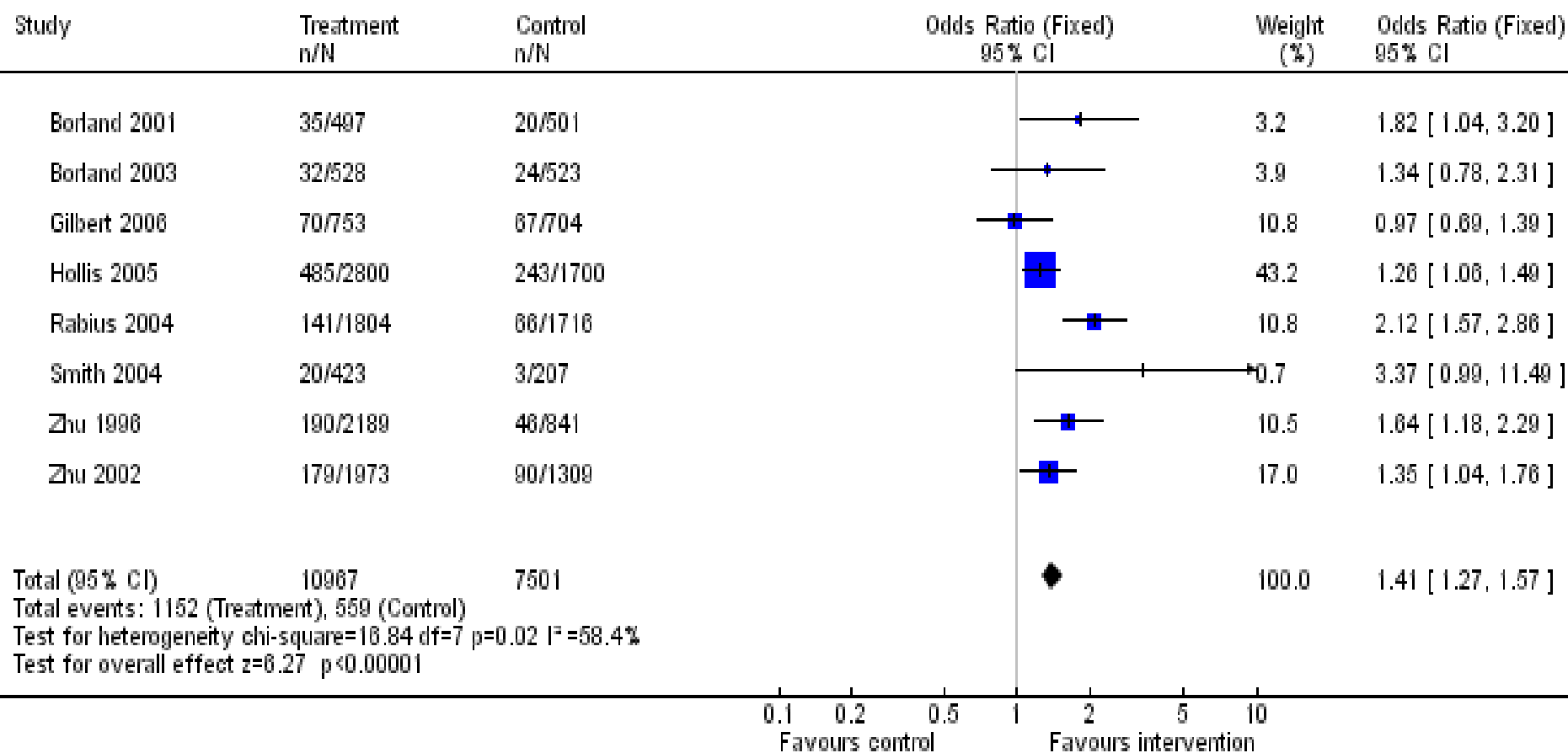
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Review: Telephone counselling for smoking cessation

Comparison: 03 Interventions for smokers calling quitlines - effect of additional proactive calls

Outcome: 01 Long term cessation



Stead, L.F., Perera, R., Lancaster, T. Telephone counseling for smoking cessation.
Cochrane Database of Systematic Reviews, 2006, Issue 3



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Problems and Limitations of Systematic Reviews

- Lack of high quality studies
 - What happens when a review finds no good evidence?
- Lack of information about potential harmful effects, costs
- Narrow questions
- Role of values: systematic reviews are not designed to make decisions, simply to *assist* in making them



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Unique Challenges in Population / Public Health

The role of meta-analysis:

- Clinical heterogeneity
- Multiple interventions
- Multiple outcomes
- Statistical heterogeneity



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Unique Challenges in Population / Public Health

How to decide which designs to include:

- RCTs
- Observational Studies
- Case-Control
- Before/After Studies
- Qualitative Designs
- Uncontrolled



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Resources for Systematic Reviews

- health-evidence.ca www.health-evidence.ca
- The Cochrane Collaboration <http://www.cochrane.org>
- Guide to Community Preventive Services
<http://www.thecommunityguide.org/>
- Health Promise <http://healthpromise.hda-online.org.uk/>
- Effective Public Health Practice Project
<http://www.myhamilton.ca/myhamilton/CityandGovernment/HealthandSocialServices/Research/EPHPP/>



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Registry of Knowledge Translation Methods and Tools for Public Health

... an interactive and expanding on-line database
of resources to support different types and
stages of knowledge translation activities
relevant to public health.

www.nccmt.ca



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- What's new?
- About The Registry
- Glossary
- Icon Legend
- Suggest a Method or a Tool
- Give Us Your Feedback
- Discussion Forum
- Contact Us
- Acknowledgements
- Evidence Informed Public Health**
- Workshops & Events**
- Partnerships & Networking**

Targeted Search

Use this strategy to search for methods and tools using one or more preset parameters. Select the desired choice(s) below then hit the Search button. The more items you check the FEWER results you will obtain as records must match ALL selected criteria to be displayed.

Resource Type

-  Method
-  Tool


Stage

-  Planning
-  Doing
-  Evaluating

Activity

-  Synthesis
-  Dissemination
-  Exchange
-  Application

Evaluation

-  Has been Evaluated

Validity (Tools Only)

- 





Reliability (Tools Only)

-  Properties Meet Accepted Standards

Methodological Rating (Tools Only)

-  Strong
-  Moderate
-  Weak
-  Unknown/No Evidence

Completion Time

-  Less than 10 minutes
-  10 to 30 minutes
-  30 to 60 minutes
-  More than 60 minutes





Cost

-  Cost
-  No Cost



Language

-  English
-  French
-  Other

Format

-  Paper copy
-  CD or DVD
-  On-line Access
-  Periodical

Permission

-  Public Domain
-  Proprietary

Release Date

- 1985 - 1990
- 1991 - 1995
- 1996 - 2000
- 2001 - 2005
- 2006 - 2010



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Matrix Search

Decide which matrix combines your priority search fields and which levels you are interested in within each field. The numbers in the cells indicate how many resources are available in each category. To view the desired methods and/or tools click the number in the appropriate cell.

Matrix 1: Resources x Activities

ACTIVITIES	RESOURCES	
	Methods	Tools
 Synthesis	2	3
 Dissemination	0	0
 Exchange	1	2
 Application	0	0

Matrix 2: Resources x Stages

STAGES	RESOURCES	
	Methods	Tools
 Planning	0	0
 Doing	2	3
 Evaluating	1	2



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Questions?

Contact us:

National Collaborating Centre for Methods
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Email Donna Ciliska ciliska@mcmaster.ca



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