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PubMed Self-Study Material: Quick and Efficient Search for Medical Literature

Introduction

- Imagine you are planning to write your doctoral thesis on „Diabetes" and you are looking for suitable literature.

- This self-study material presents three strategies that will make your literature search in PubMed quick and efficient:

  1. Quick full-text search
  2. Key-word search with Medical Subject Headings (MeSH)
  3. Full-text search in Advanced Search Builder

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General Information

- What is PubMed?
  - The largest database of medical literature in the world
  - Free literature search system of the U.S. NLM (National Library of Medicine)
- PubMed retrieves journal articles
- With PubMed you will find:
  - References since 1948 (for older literature refer to the printed version, the „Index Medicus")
  - Bibliographic information, such as authors, titles etc.
  - In most cases, abstracts, i.e. short summaries of the articles
  - Usually, links to full texts
- Most articles are collected from English-language journals
- Journals published in languages other than English offer English abstracts, while the languages of the articles remain German, French, Russian etc.
- → **Use English search terms, since the language of the database is English!!!**
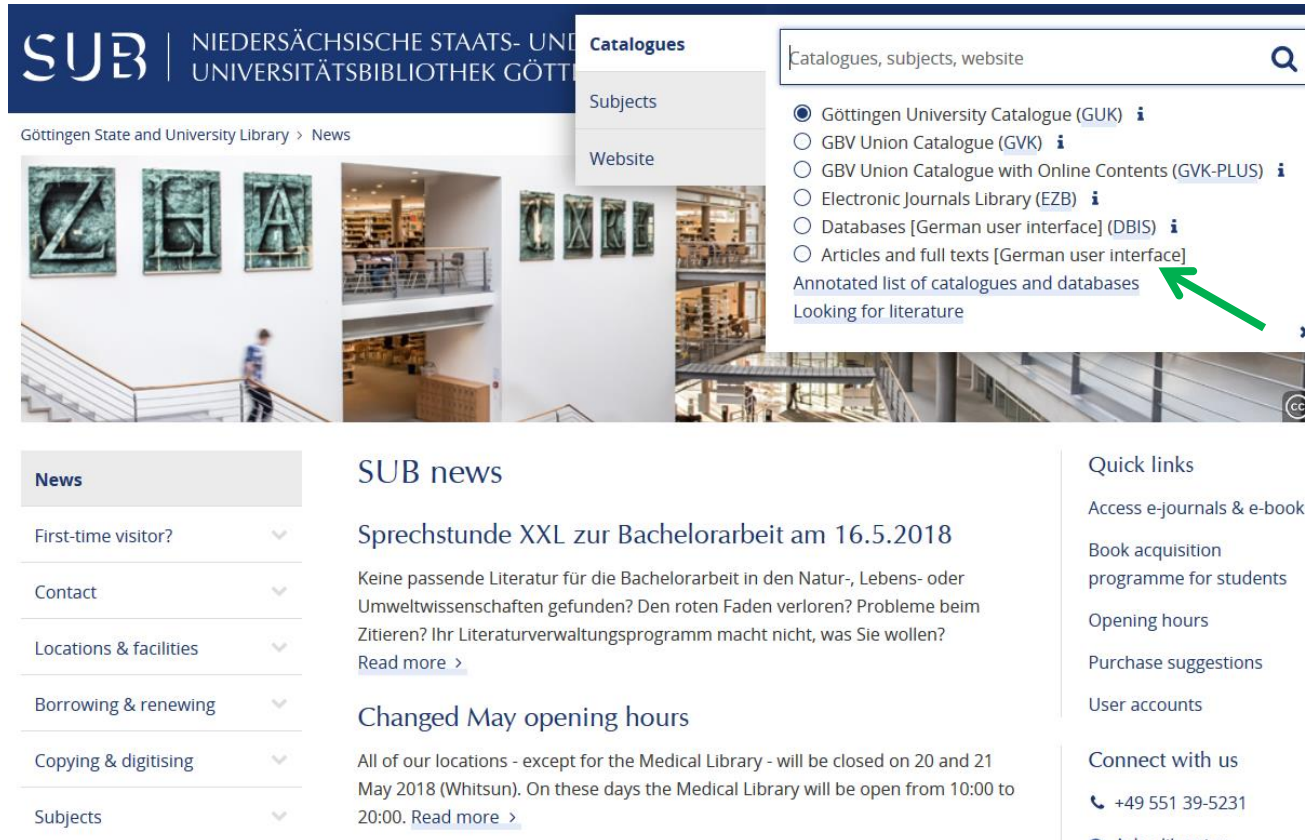
General Search Tips

- Use *wildcard operators* at the end of your search terms, e.g. a search for *neoplas** will also retrieve results for *neoplasia, neoplasic, neoplasm* etc.

- Use the *Boolean operators AND OR NOT*
  - Retrieve results that contain all of the search terms (connected by **AND**)
  - Retrieve results that contain either one of the search terms, use brackets to combine boolean operators, e.g. (Illness xy AND Medication a) **OR** (Illness xy AND Medication b)
  - Retrieve results for the first search term but **NOT** the second

- Use quotation marks for a *phrase search*, e.g. „growth hormone"

- Proceed with your search systematically, e.g. from general to specific

- „Play" with the terms (use synonyms, related terms)

- Use not too many, but also not too few search words

How do I access PubMed?

- To have access to licenced full-text materials, you should access PubMed via the homepage of the Göttingen State and University Library

- Go to the DBIS-link that you find in the search menu

How do I access PubMed?

- You will find PubMed either among the top suggestions for the subject of „Medicine" or via the quick search

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Screenshot of the page http://rzblx10.uni-regensburg.de/

How do I access PubMed?

- After finding PubMed in DBIS, you will see these two links:

  - *han.sub.uni-goettingen.de/han/pubmed:*
    - Use this link when off campus, i.e. when you are not logged into the university network. You can log in via this Han-server with your user number and the library password, and use all resources licenced by the University of Göttingen from home.

  - *Verlags-URL:*
    - Choose this link if you are using one of the university PCs or your device is connected to the university network.

PubMed	
Weitere Titel:	Medline (PubMed = Public Medline) National Library of Medicine - NLM Index Medicus
Recherche starten:	http://han.sub.uni-goettingen.de/han/pubmed
Weitere lizenzierte Zugänge:	Verlags-URL Zugang für Gäste (ohne SUB-Benutzerkonto) an den Katalogrechnern
Verfügbar:	frei im Web **F**

Screenshot of the page http://rzblx10.uni-regensburg.de/

Search strategy 1: Quick full-text search in PubMed

- If you search for *„diabetes mellitus"* in PubMed, your hit list should look as follows:

In this tab, you can sort your list of results by publication year, author etc.

Set appropriate filters to refine your search results. For more filters click „Show additional Filters".

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Search strategy 1: Quick full-text search in PubMed

- Set *Filters* to refine your search results
  - You can choose the range of publication years in *„Publication dates"* or the language in *„Show additional filters → Languages"*.
  - NOTE: The filters you set remain valid for your next search, i.e. they need to be deleted manually. You will find detailed descriptions of individual filters in the glossary.
  - Refine your search results by providing more search terms in the search field and using the above-mentioned *„Boolean Operators"* AND, OR und NOT.
  - Type in, for example, *„diabetes mellitus AND (therapy OR medication)".*

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Search strategy 2: Keyword search with MeSH (Medical Subject Headings)

- What are these MeSH and why should they be used in literature research?
  - MeSH are Medical Subject Headings assigned by subject experts to describe the topics of the article → *Drawback:* The most recent articles cannot be found via MeSH yet, as keywords are being added only gradually.
  - You can limit your search to certain aspects of a topic, e.g. *diagnosis*
  - With MeSH database you can conduct a highly accurate content-based search
  - MeSH is organised as a kind of dictionary that includes cross-references to sub-topics for the respective search term

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Search strategy 2: Keyword search with MeSH

- Type the search phrase *„diabetes mellitus"* in the search field.
- Make sure you choose „MeSH" in the drop-down menu on the left side of the search field.
  - NOTE: You can look for only one search term at a time. You can, however, save it in the „Search Builder", which allows you to store your search terms and subsequently look for them again.

Search strategy 2: Keyword search with MeSH

- Choose the keyword „Diabetes Mellitus" from the list of results and click on it. A new window with the so-called „*Subheadings*" will appear. You can limit your search with the help of subheadings if, for example, you wish to research about therapy for diabetes.

„Subheadings" are the underlying aspects of your chosen subject area. If you look only for therapy for diabetes, for instance, you can limit your search by choosing one or more „Subheadings".

By ticking this field you set your search term as the main keyword. Thereafter your search will only retrieve articles that primarily deal with the topic.

Diabetes Mellitus

A heterogeneous group of disorders characte

PubMed search builder options

Subheadings:

- analysis
- anatomy and histology
- blood
- blood supply
- cerebrospinal fluid
- chemical synthesis
- chemically induced
- chemistry
- classification
- complications
- congenital
- diagnosis
- diagnostic imaging
- diet therapy
- drug therapy

- economics
- education
- embryology
- enzymology
- epidemiology
- ethnology
- etiology
- genetics
- history
- immunology
- metabolism
- microbiology
- mortality
- nursing
- organization and administration

- parasitology
- pathology
- physiology
- physiopathology
- prevention and control
- psychology

- urine
- veterinary
- virology

Add to search builder   AND ▾

Search PubMed

You Tube Tutorial

Related information

PubMed

Recent Activity   Turn Off   Clear

- Restrict to MeSH Major Topic.
- Do not include MeSH terms found below this term in the MeSH hierarchy.

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Search strategy 2: Keyword search with MeSH

- Further at the bottom of the page you will find the so-called „MeSH-Tree"

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Restrict to MeSH Major Topic
Do not include MeSH terms found below this term in the MeSH hierarchy.

Tree Number(s): C18.452.394.750, C19.246
MeSH Unique ID: D003920
See Also:

- Diabetes Insipidus
- Diet, Diabetic
- Prediabetic State
- Scleredema Adultorum
- Glycosylation End Products, Advanced
- Glucose Intolerance
- Gastroparesis

All MeSH Categories
  Diseases Category
    Nutritional and Metabolic Diseases
      Metabolic Diseases
        Glucose Metabolism Disorders
          Diabetes Mellitus
            Diabetes Mellitus, Experimental
            Diabetes Mellitus, Type 1
              Wolfram Syndrome
            Diabetes Mellitus, Type 2
              Diabetes Mellitus, Lipoatrophic
            Diabetes, Gestational
            Diabetic Ketoacidosis
            Donohue Syndrome
            Latent Autoimmune Diabetes in Adults
            Prediabetic State

All MeSH Categories
  Diseases Category
    Endocrine System Diseases
      Diabetes Mellitus
        Diabetes Complications
          Diabetic Angiopathies +
          Diabetic Cardiomyopathies
          Diabetic Coma +
          Diabetic Ketoacidosis
          Diabetic Nephropathies

CHEMOAFFINITY IN THE ORDERLY GROWTH OF NERVE FIBER PATTERNS

diabetes mellitus (61)

MeSH

Lactose Intolerance in Adults: Biological Mechanism and Dietary Management

See more...

Extending the search by hierarchically-organised MeSH terms is not possible.

You can trace where your MeSH term is located in the hierarchically-constructed „MeSH-Tree".

This way, you can check whether you have chosen a general or a specific term.

Search strategy 2: Keyword search with MeSH

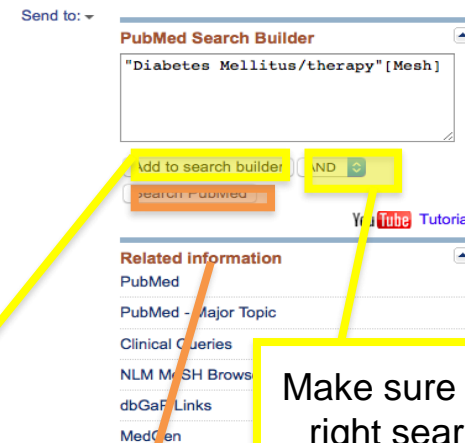- To be able to access the article you need you should enter your search query in PubMed:

You can look for further MeSH terms that you require for your research. The terms that you have already added to the Search Builder remain saved.

Choose your MeSH term (and, if relevant, subheadings) and click on „Add to search builder". You can also add subheadings of your own choice.

Make sure to choose the right search operator!

After you have added all MeSH terms to the Search Builder, click on „Search PubMed" to access full text.

Search strategy 2: Keyword search with MeSH

- Tip: If you are not sure which terms to use for your search, choose an article that is relevant to your topic.
  - Have a look at the MeSH terms to get ideas for your search
  - Terms that reflect the major points of the article are marked with an asterisk *

MeSH terms, Substances

MeSH terms
Diabetes Mellitus/drug therapy*
Drug Delivery Systems/methods*
Humans
Hypoglycemic Agents/chemistry
Hypoglycemic Agents/pharmacology*
Liposomes/chemistry*
Liposomes/metabolism
Nanoparticles/chemistry*

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Search strategy 3: Full-text search in Advanced Search Builder

- Unlike the search with MeSH, where you can only search using medical keywords, the Advanced Search Builder allows you to conduct *a very specific full-text search.*

- Switch to the „Advanced" search option that you find below the search bar.

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Search strategy 3: Full-text search in Advanced Search Builder

- You will then see the Advanced Search Builder in which you can type in your search term, e.g. „*diabetes mellitus*" (All fields).

You can call up an index of terms related to your search term.

You can limit your search to publications by a specific author (choose ‚*Author*') or combine different search criteria in your search query.

Search strategy 3: Full-text search in Advanced Search Builder

- Tip: The search option „MeSH Terms" or „Subheadings" in Advanced Search Builder is recommended if you have saved your MeSH terms in advance. It is advisable to use the MeSH database for convenient content-based research.

- Advanced Search Builder stores conducted search queries (for one browser session) which you can then use and combine in your further search.

Builder

All Fields

AND All Fields

Search or Add to history

You can save search queries for your current browser session here.

Show index list

The „History" is a kind of preview of the search results for this query.

History

Download history Clear history

Search	Add to builder		Items found	Time
#1	Add	Search **diabetes**	417877	02:15:33

Previously conducted search queries can be moved to the „Builder" and used later again.

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Organising your research – MyNCBI (National Center for Biotechnology Information): processing the results and customising search

- Click on „*Sign in to NCBI*" at the top right corner of the page

- Register or sign in

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The start page in MyNCBI displays an overview of your Saved Searches/ Collections/ Bibliography/ Recent Activity

Sharing collections:
If you want your peers to be able to access your list of results, you can enable access to your collections:

• MyNCBI -> Collections
• Go to ‚*Manage Collections*,
• Click on ‚*Private*' in the column ‚*Sharing*'
• Change the status to ‚*Public*'

Organising your research – MyNCBI: Permanent Data Storage

- You can add individual search results directly to a collection
- Or copy results of different searches to clipboard first (*Send to Clipboard*)
- Tick the results of your choice (if you wish to import the whole list, do not tick) and click *Send to Collection*
- You can create collections on different topics

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You can also save your search queries:

• Click on *Create Alert* (under the search bar)
• Fill in the details and click *Save*
• When new items relevant for your saved search query are added to PubMed, you will receive email notifications

Organising your research – Using the „Send to" function

- The list of search results in PubMed can be edited in different ways. You can call up additional settings by clicking ‚Send to'

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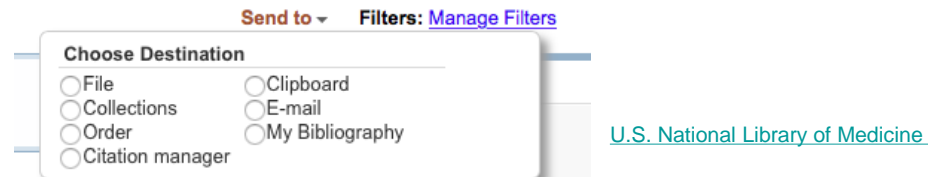
  – <u>File</u>: download to save (perfect for Endnote, as you can choose the format ‚Medicine', which enables the import of an unlimited list of results)

  – <u>Collections</u>: add results to a collection in MyNCBI

  – <u>Order</u>: order directly within the USA (rather expensive!)

  – <u>Citation Manager</u>: export to a reference management programme

  – <u>Clipboard</u>: copy individual results to clipboard

  – <u>Email</u>: send results to an email address

  – <u>My Bibliography</u>: add results to your own bibliography in MyNCBI

- **Tip: By ticking the boxes above the result numbers you can mark different results that you wish to save. Otherwise, all results will be selected.**

Further Support for PubMed

- Access to Full Texts:
  - Here you will find detailed guidelines on how to access full texts:

    „Zugriffsmöglichkeiten auf Volltexte von Zeitschriftenaufsätzen für Medizinstudierende" (only in German)

- Course on PubMed by the Medical Library:
  - All dates can be found here
  - Refer to the Circulation Desk in the Medical Library for further information

- YouTube Tutorials:
  - The NCBI offers English-language Video Tutorials on various functions in PubMed

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Glossary – Filters in PubMed

- **Article Types:** type of publication, e.g.:
  - Clinical Trial: a clinical study
  - Letter: a note, commentary on an article
  - Meta-Analysis: a summary and an evaluation of data from different studies
  - Practice Guideline: guidelines
  - Randomized Controlled Trial: a clinical study of (a) control group(s), where test subjects are allocated to groups on a random basis
  - Review: an overview of the (current) state of research
- **Text Availability:** reducing the results to articles with free access or those available in full text
- **Publication Dates:** sorting the results by their publication dates
- **Species:** selecting the species examined (human or animal) – recommended for the search for animal models
- **Languages:** selecting the language of the original article
- **Sex:** selecting the gender of the subjects examined
- **Subjects:** restricting the results to a certain subject area (e.g. AIDS, cancer, or the History of Medicine)
- **Journal Categories:** limiting the search to journals or databases
- **Ages:** selecting the age of the subjects examined
- **Search Fields:** selecting a search key, e.g.:
  - A search for „*health*" with „Author" set as a search key will retrieve results like „Health, A." or „Health, V.B."
  - With the search key „Journal" you will retrieve „American Journal of Health Behavior" or „North Carolina Journal of Mental Health"
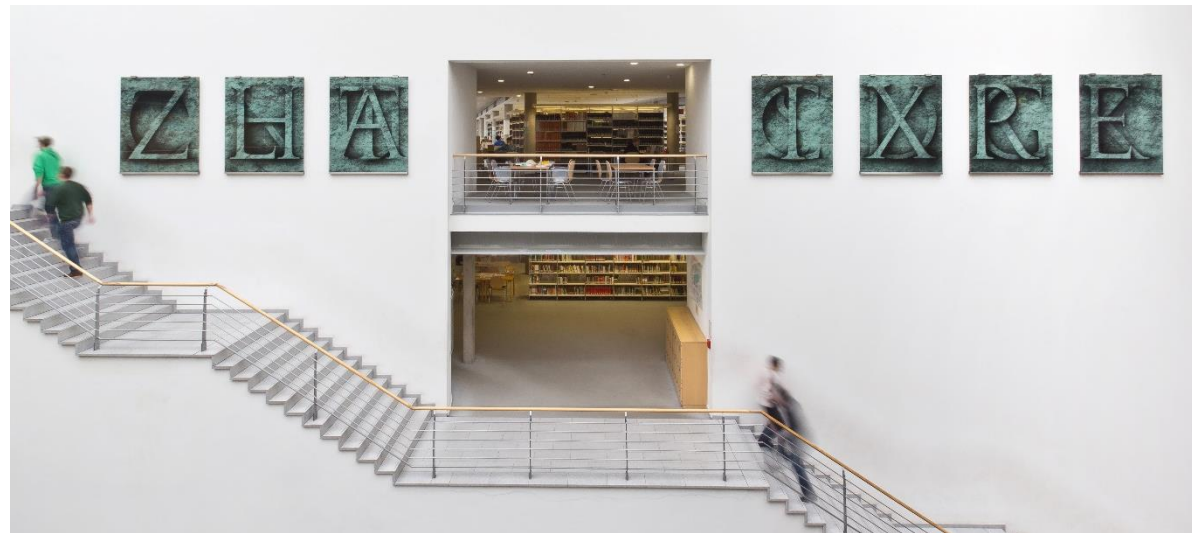
Glossary – Types of Publications in Medicine

- **Journal Article:** a journal article on a certain topic
- **Review:** an article that evaluates a number of important publications on a certain topic and summarises the current state of research
- **Clinical Trial:** an article on the results of a clinical study
- **Systematic Review:** a larger scholarly work that systematically and methodically assesses all available primary studies, qualitatively evaluates, and statistically describes the results (Meta-Analysis)
- **Guideline:** recommendations developed to assist the decisions about appropriate health care for specific clinical circumstances
- **Health Technology Assessment:** a systematic assessment of health-related actions that examines the efficiency, safety as well as ethical, legal, and organisational impacts of a health-care intervention

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We wish you the best of luck with your studies!

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