Introduction to

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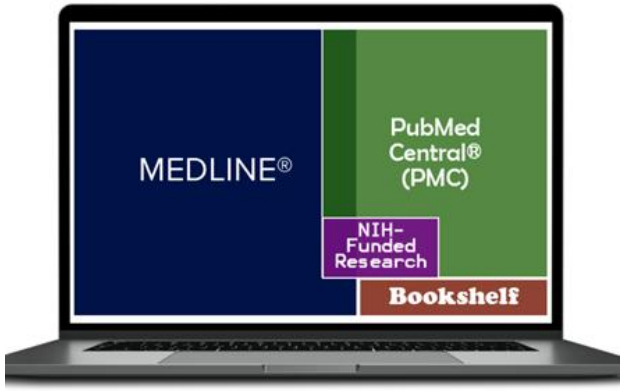
About Pubmed

- Free bibliographic database for the retrieval of biomedical and life sciences literature
- Freely available online since 1996, PubMed has been developed by the National Center for Biotechnology Information (NCBI), at the U.S. National Library of Medicine (NLM), located at the National Institutes of Health (NIH)

CONTENTS:

- More than 33 million citations and abstracts from more than 5200 journals (Medline titles) plus not-Medilne records/journals and a small number of books and individual chapters from Bookshelf
- Links to the full text (either free or upon payment from publishers) – approximately 40% free records since 5 years, thanks to the articles deposited in PMC and the growth of Open Acces the articles made available by the publishers
- Daily update since 2014



Citations and author abstracts from more than 5,000 biomedical journals

What is in Pubmed

More details: MEDLINE PubMed Production Statistics

Medline as a Journal / Publisher Whitelist

Content selection criteria allow you to use Medline as a "whitelist" to choose quality journals, to read or where to publish, allowing you to easily avoid pseudo/poor-scientific and predatory publishing (i.e. Google Scholar or PubMed->PubmedCentral).

A journal's inclusion in PubMed does not mean the journal has a stamp of approval from NIH. There is such a low barrier to inclusion that researchers are advised to be suspicious of any journal that boasts about its inclusion in PubMed, especially if the boasting is prominently displayed on the journal's main web page. PubMed inclusion is not an achievement that merits boasts.

Editorial processes & long term preservation	Scientific / methodological rigor	Editorial policy	Editorial processes & long term preservation	Journal & metadata indexing





Medline selection criteria:
https://www.nlm.nih.gov/medline/medline_journal_selection.html

What about full text?

- Pubmed is a citation archive, it does not include the articles full text, but shows the relevant links
- Full text may be available either free (approximately 40% over 5 years)
- or upon payment (institutional subscription)

that is:

- Free from the publisher site
- Upon payment from the publisher site (UNIPD subscription)
- Free from Pubmed Central: archive including biomedical articles either deposited according to public access policy from NIH-funded research and articles made available thanks to journal and publisher deposit agreements

N.B.: recommended access to Pubmed from unipd link in order to access the institutional URL resolver for the full text (from GO icon)

The new Pubmed

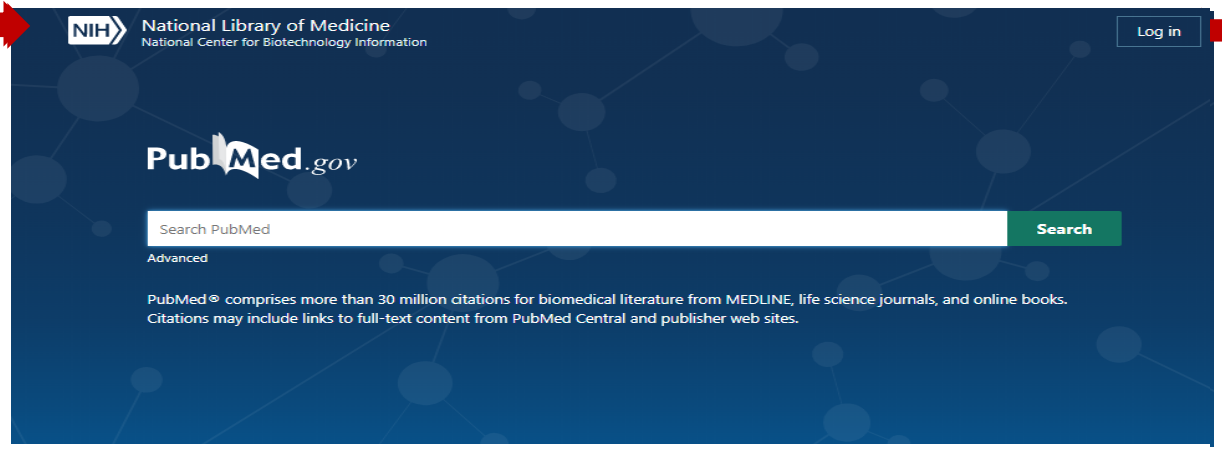
- Launched in november 2019, it has become the default interface since May 2020

Main features:

- Clean, modern look
- Easy-to-use interface
- Improved search engine designed to help find the best match for your query
- Running in the cloud
- Designed to offer the same functionalities on a variety of devices

PUBMED HOME PAGE

NIH
Link to NCBI databases



Log in
Access to MyNCBI, personal space

Learn
Instruction materials

Mesh Database
Link to Medical Subject Headings, medical controlled vocabulary

Trending Articles
Articles with a recent growth in interest

Single citation matcher
Bibliographic record search

Journals
journal information, title abbreviations, indexing status

Two main tasks to perform in Pubmed

1. *Find a specific article…*

What Do Medical Students Do for Self-Care? A Student-Centered Approach to Well-Being. Ayala EE, Omorodion AM, Nmecha D, Winseman JS, Mason HRC.Teach Learn Med. 2017 Jul-Sep;29(3):237-246. doi: 10.1080/10401334.2016.1271334. Epub 2017 Feb 16.

PMID: 28632007

- **Citation sensor**

Recognises combination of available bibliographic elements in a search : ex. Volume/issue, page, author, journal title, publication date, … and finds matching citation

medical students self care ayala omorodion
or
teach learn med ayala 29(3) 2017

- **Title matcher**

Recognises combination of title words

- **Search builder**: search of elements belonging to title (from Advanced search page)
- **PMID** (Pubmed records identifier)
- **Single citation matcher**: box to be filled with available publication information (

2. *Search for articles on a specific topic… with the right tools*

Author searching

Searching by author can be tricky as:

- Many authors may publish under the same name
- The same author name may be written in different ways

Best practice: start with last name and initials, no need to tag, capitalize or punctuate,

- Avoid searching using full author names
- Not all PubMed records include full author names
- Using full first names may miss articles where only initials were provided

You may click an author link on the abstract display to execute a search for the author in PubMed. Results will display using a ranking algorithm if the author name is computationally similar for additional PubMed citations

ORCID identifier , when more more widely used, will be the best way to search by author

At the moment, we propose author searching in Scopus (multidisciplinary bibliographic database by Elsevier equipped with suitable tools for research evaluation)

The bibliographic record – 1

Bibliographic information: year, volume/issue pages, doi, …

Publication type: if specified

External links for article retrieval

Author: affiliation details

full text options at the University of Padova Library System **N.B.**: only in Abstract format

PMID: Pubmed standard identifier for each record

Abstract often structured

Review > Lancet. 2014 Mar 15;383(9921):999-1008. doi: 10.1016/S0140-6736(13)61752-3. Epub 2013 Sep 29.

The Framingham Heart Study and the epidemiology of cardiovascular disease: a historical perspective

Syed S Mahmood [1], Daniel Levy [2], Ramachandran S Vasan [3], Thomas J Wang [4]

Affiliations + expand

PMID: 24084292 PMCID: PMC4159698 DOI: 10.1016/S0140-6736(13)61752-3

Free PMC article

Abstract

On Sept 29, 2013, the Framingham Heart Study will celebrate 65 years since the examination of the first volunteer in 1948. During this period, the study has provided substantial insight into the epidemiology and risk factors of cardiovascular disease. The origins of the study are closely linked to the cardiovascular health of President Franklin D Roosevelt and his premature death from hypertensive heart disease and stroke in 1945. In this Review we describe the events leading to the foundation of the Framingham Heart Study, and provide a brief historical overview of selected

FULL TEXT LINKS

THE LANCET FULL-TEXT ARTICLE

PMC FREE Full text

ACTIONS

Cite

Favorites

SHARE

PAGE NAVIGATION

< Title & authors

The bibliographic record – 2

the early stage (stage 0 or 1). To conclude, C. elegans scent-based analyses might provide a new strategy to detect and study disease-associated scents.

Conflict of interest statement

Competing Interests: The authors have declared that no competing interests exist.

Figures

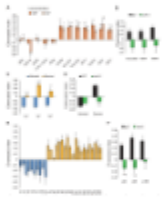


Fig 1. *C. elegans* can respond...

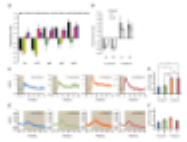


Fig 2. Olfactory neurons of *C* ....

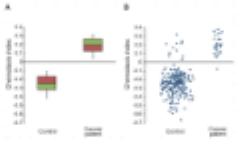


Fig 3. NSDT of 242 urine samples.

Similar articles

Efficiency of Gastrointestinal Cancer Detection by Nematode-NOSE (N-NOSE).

Kusumoto H, Tashiro K, Shimaoka S, Tsukasa K, Baba Y, Furukawa S, Furukawa J, Niihara T, Hirotsu T, Uozumi T.

2020 Jan-Feb;34(1):73-80. doi: 10.21873/invivo.11747.

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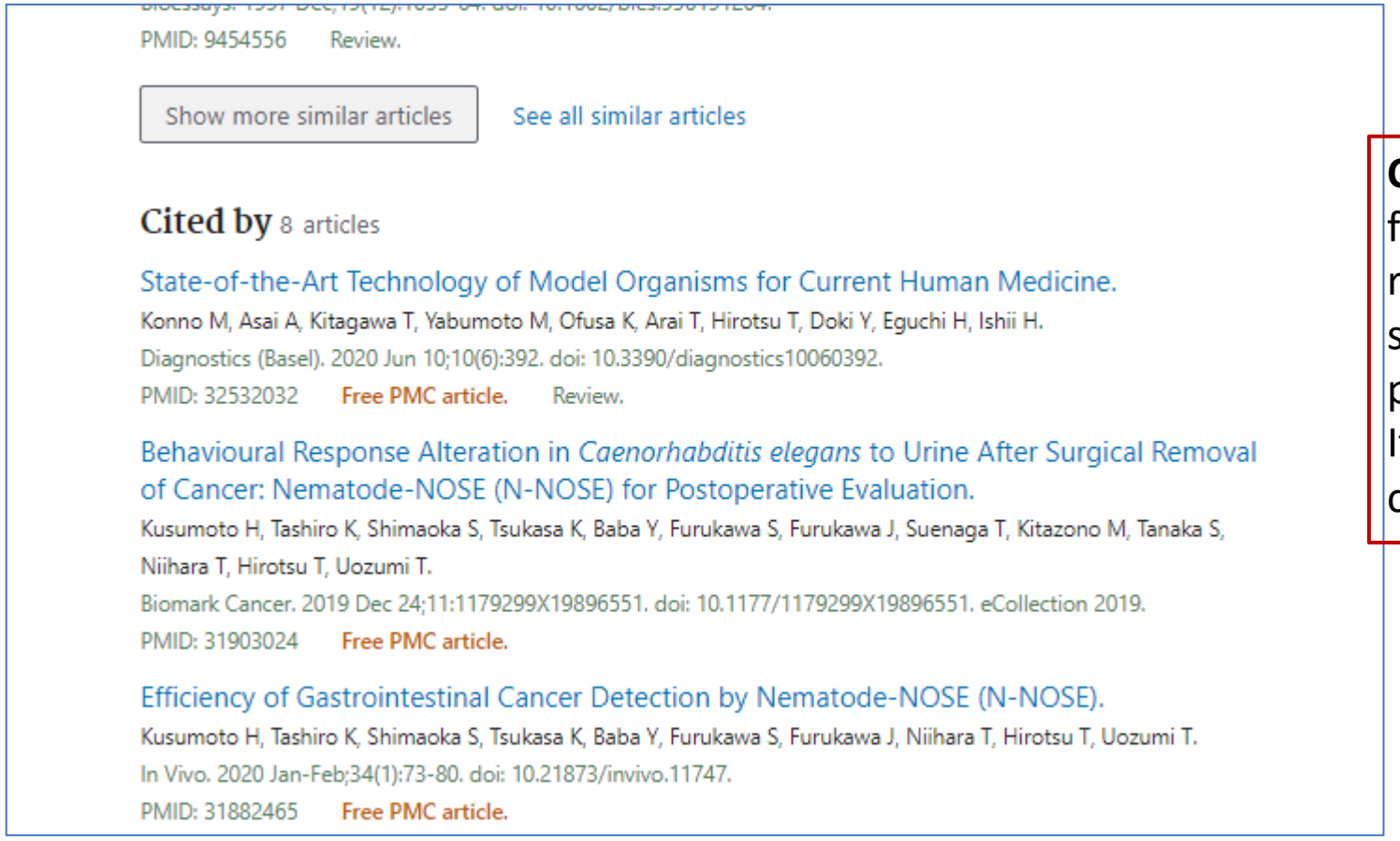
Figures may be available

Side bar menu for page navigation

Similar articles closely related articles ranked from most to least relevant
To select and save, click See all similar articles at the end of section

The bibliographic record – 3



PMID: 9454556 Review.

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Cited by 8 articles

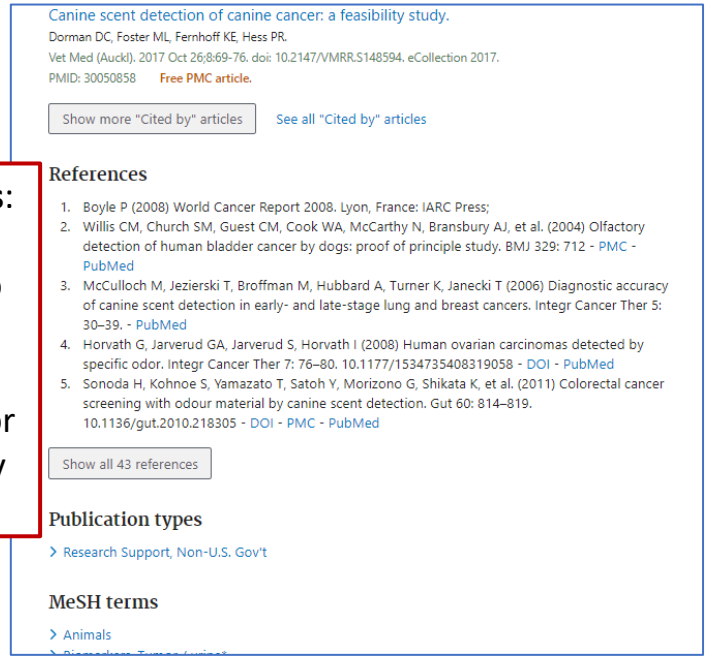
State-of-the-Art Technology of Model Organisms for Current Human Medicine.
Konno M, Asai A, Kitagawa T, Yabumoto M, Ofusa K, Arai T, Hirotsu T, Doki Y, Eguchi H, Ishii H.
Diagnostics (Basel). 2020 Jun 10;10(6):392. doi: 10.3390/diagnostics10060392.
PMID: 32532032 Free PMC article. Review.

Behavioural Response Alteration in *Caenorhabditis elegans* to Urine After Surgical Removal of Cancer: Nematode-NOSE (N-NOSE) for Postoperative Evaluation.
Kusumoto H, Tashiro K, Shimaoka S, Tsukasa K, Baba Y, Furukawa S, Furukawa J, Suenaga T, Kitazono M, Tanaka S, Niihara T, Hirotsu T, Uozumi T.
Biomark Cancer. 2019 Dec 24;11:1179299X19896551. doi: 10.1177/1179299X19896551. eCollection 2019.
PMID: 31903024 Free PMC article.

Efficiency of Gastrointestinal Cancer Detection by Nematode-NOSE (N-NOSE).
Kusumoto H, Tashiro K, Shimaoka S, Tsukasa K, Baba Y, Furukawa S, Furukawa J, Niihara T, Hirotsu T, Uozumi T.
In Vivo. 2020 Jan-Feb;34(1):73-80. doi: 10.21873/invivo.11747.
PMID: 31882465 Free PMC article.

Cited by: citations from NCBI resources or supplied by publisher.
It may not be a complete list.

The bibliographic record – 4


Canine scent detection of canine cancer: a feasibility study.
Dorman DC, Foster ML, Fernhoff KE, Hess PR.
Vet Med (Auckl). 2017 Oct 26;8:69-76. doi: 10.2147/VMRR.S148594. eCollection 2017.
PMID: 30050858 Free PMC article.

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References

1. Boyle P (2008) World Cancer Report 2008. Lyon, France: IARC Press;
2. Willis CM, Church SM, Guest CM, Cook WA, McCarthy N, Bransbury AJ, et al. (2004) Olfactory detection of human bladder cancer by dogs: proof of principle study. BMJ 329: 712 - PMC - PubMed
3. McCulloch M, Jezierski T, Broffman M, Hubbard A, Turner K, Janecki T (2006) Diagnostic accuracy of canine scent detection in early- and late-stage lung and breast cancers. Integr Cancer Ther 5: 30–39. - PubMed
4. Horvath G, Jarverud GA, Jarverud S, Horvath I (2008) Human ovarian carcinomas detected by specific odor. Integr Cancer Ther 7: 76–80. 10.1177/1534735408319058 - DOI - PubMed
5. Sonoda H, Kohnoe S, Yamazato T, Satoh Y, Morizono G, Shikata K, et al. (2011) Colorectal cancer screening with odour material by canine scent detection. Gut 60: 814–819. 10.1136/gut.2010.218305 - DOI - PMC - PubMed

Show all 43 references

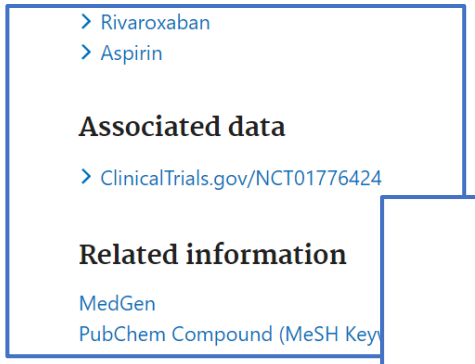
Publication types

› Research Support, Non-U.S. Gov't

MeSH terms

› Animals

References: includes citations to full-text articles in PMC and/or supplied by publisher

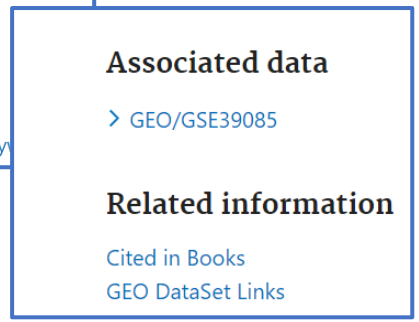

› Rivaroxaban
› Aspirin

Associated data

› ClinicalTrials.gov/NCT01776424

Related information

MedGen
PubChem Compound (MeSH Key


Associated data

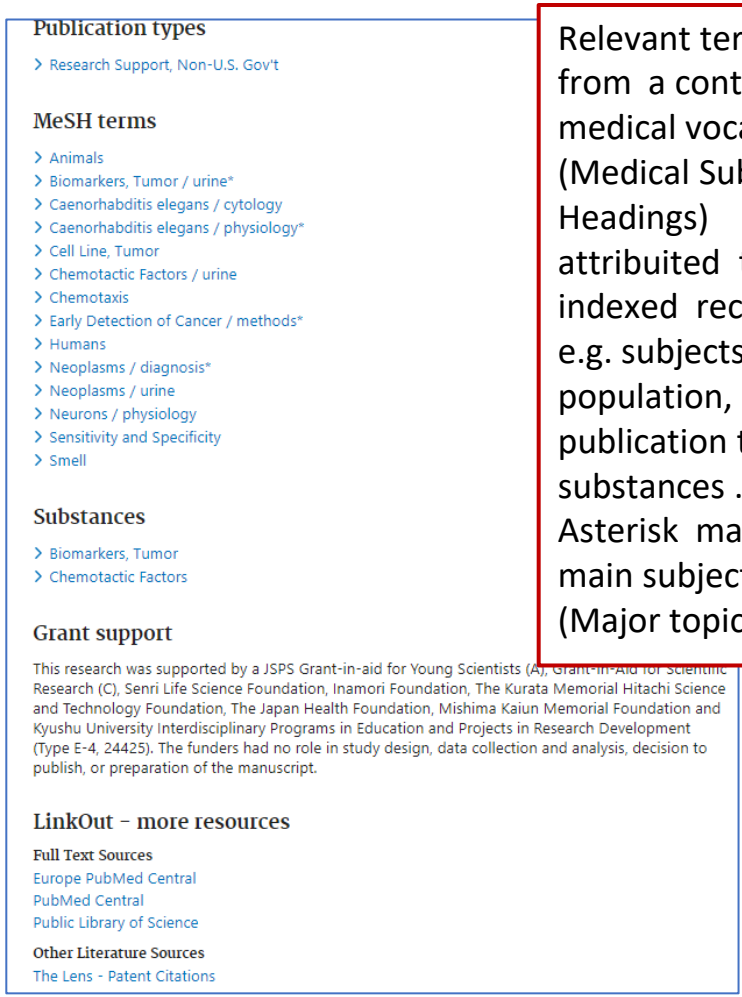
› GEO/GSE39085

Related information

Cited in Books
GEO DataSet Links

Associated Data
Link to secondary source databanks, such es. ClinicalTrials.gov, GenBank, Figshare, etc.

Related information
Links to other related NCBI databases, i.e. MedGen,


Publication types

› Research Support, Non-U.S. Gov't

MeSH terms

› Animals
› Biomarkers, Tumor / urine*
› Caenorhabditis elegans / cytology
› Caenorhabditis elegans / physiology*
› Cell Line, Tumor
› Chemotactic Factors / urine
› Chemotaxis
› Early Detection of Cancer / methods*
› Humans
› Neoplasms / diagnosis*
› Neoplasms / urine
› Neurons / physiology
› Sensitivity and Specificity
› Smell

Substances

› Biomarkers, Tumor
› Chemotactic Factors

Grant support

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LinkOut – more resources

Full Text Sources
Europe PubMed Central
PubMed Central
Public Library of Science

Other Literature Sources
The Lens - Patent Citations

Relevant terms from a controlled medical vocabulary (Medical Subject Headings) attribuited to indexed records: e.g. subjects, population, publication type, substances … Asterisk marks main subjects (Major topic)

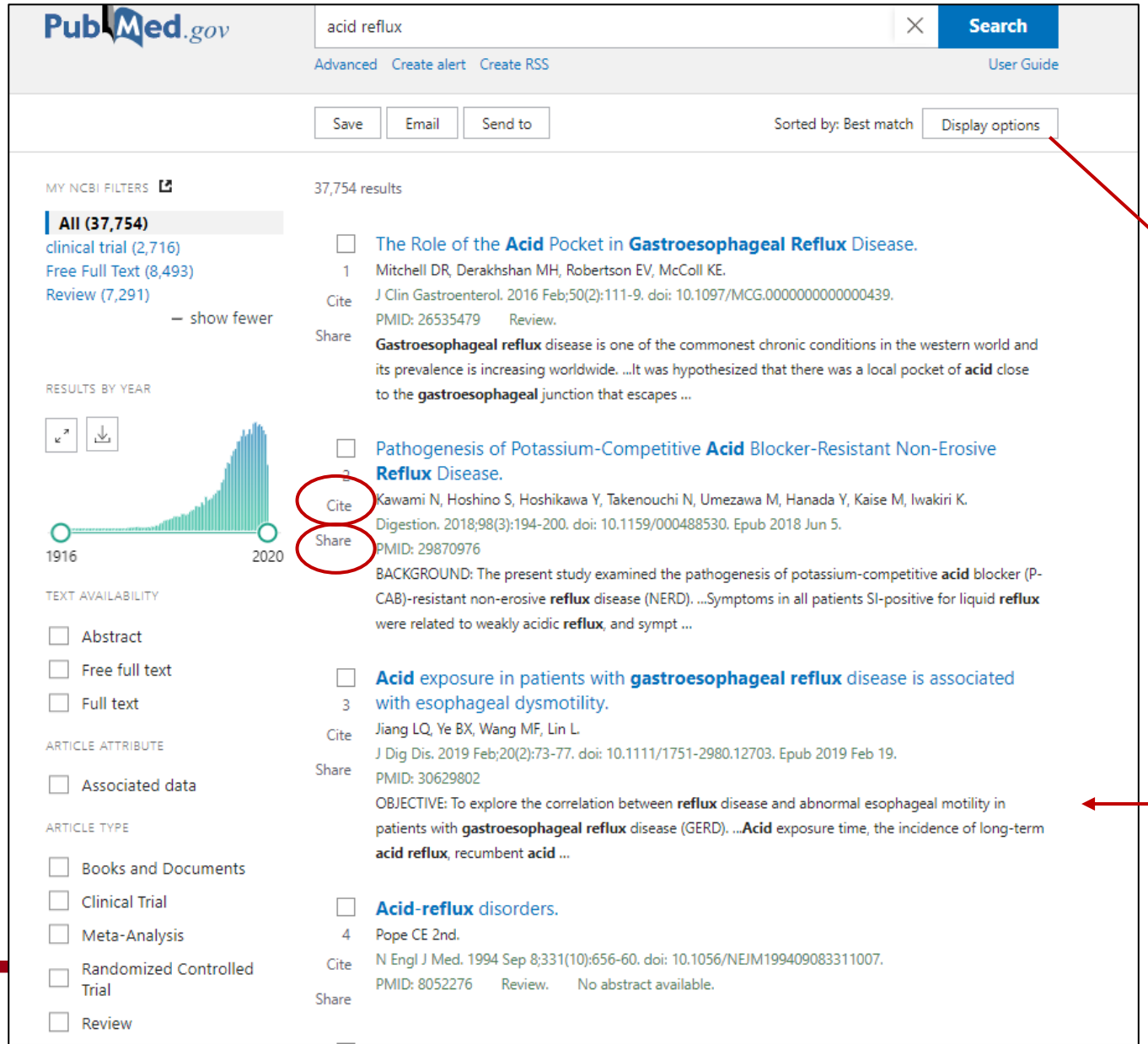
Results display

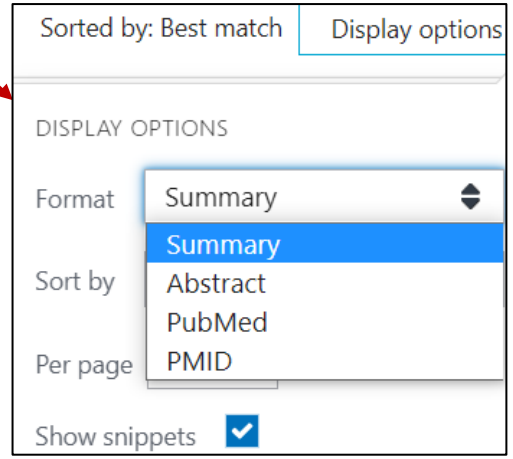
Cite: copy a citation formatted in four popular styles

Share: get the URL of single citation by copying the permalink

Results display by year and time filter

Article type filter





Snippet: significant fragment from the article abstract

Results management– some formats and options

SAVE

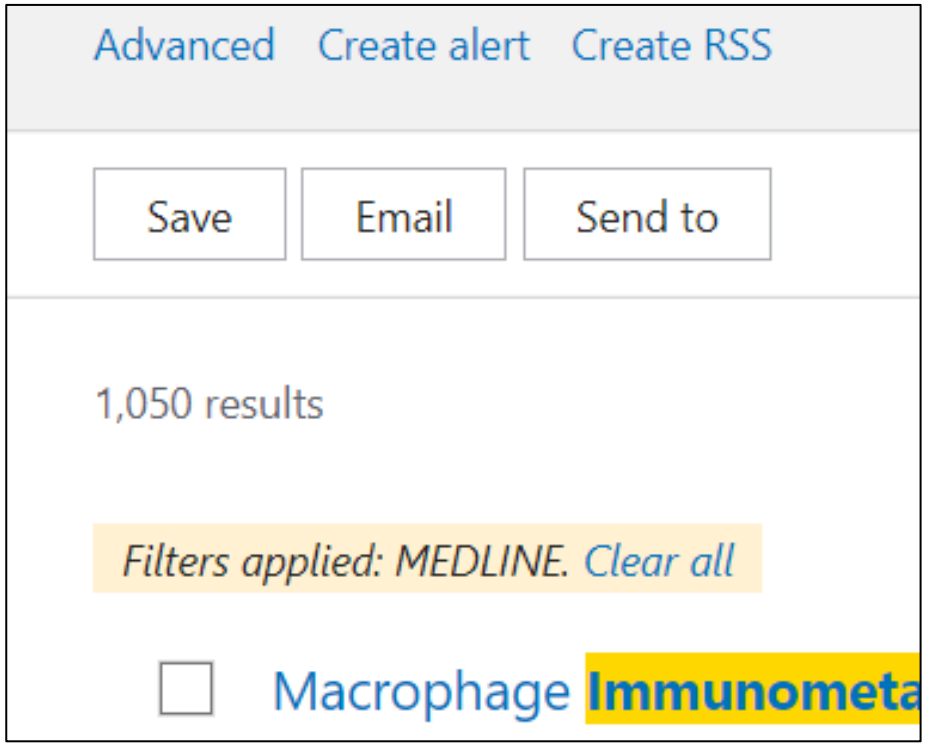
- **Pubmed**: text format including all fields and citation status
- **Abstract**: text format including abstract, limited number of fields
- **CSV**: useful to manage a high number of records, e.g. literature reviews

EMAIL

- **Abstract**: html format where GO links to full text options at the University of Padova Library System

SEND TO

- **Clipboard:** temporary store, expires after 8 hours of inactivity
- **Collections:** permanent articles storage, no limit to the collection number, 1000 records maximum upload if records are not selected
- **Citation manager**: creation of ncib file to be exported to a citation manager, e.g.. Zotero etc.



In addition: **Create alert** to save a search strategy in MyNCBI for updating of results

Indexing – when a record is added to PubMed

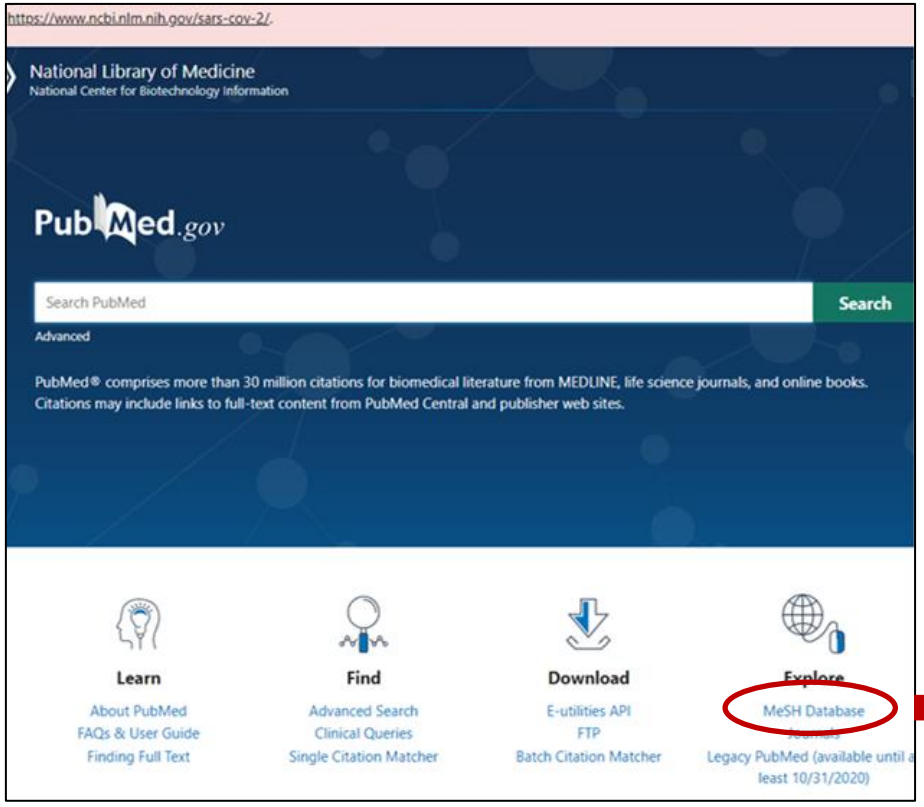
- Articles delivered to NLM close to publication, appear in in Pubmed as they are.
- At the same time, the articles from journals classified as Medline get indexed: they are subjected to close analysis, attribution of subject headings (Mesh) and other qualifiers that facilitate search retrieval.
- The most specific vocabulary terms are assigned that best describe the concepts found in the article.
- When a concept is not adequately described, the closest and more general term is used along with other vocabulary elements in coordination.
- Indexed citations acquire ″Medline″ status (see Display options -> Pubmed).
- Searching with MeSH subject terms excludes citations from journals that have not yet been fully indexed, as well as other PubMed citations that are not indexed for MEDLINE (e.g., citations that are out of scope for MEDLINE, such as a volcanology article in Science). These records do not (or do not yet) include MeSH subject terms

)

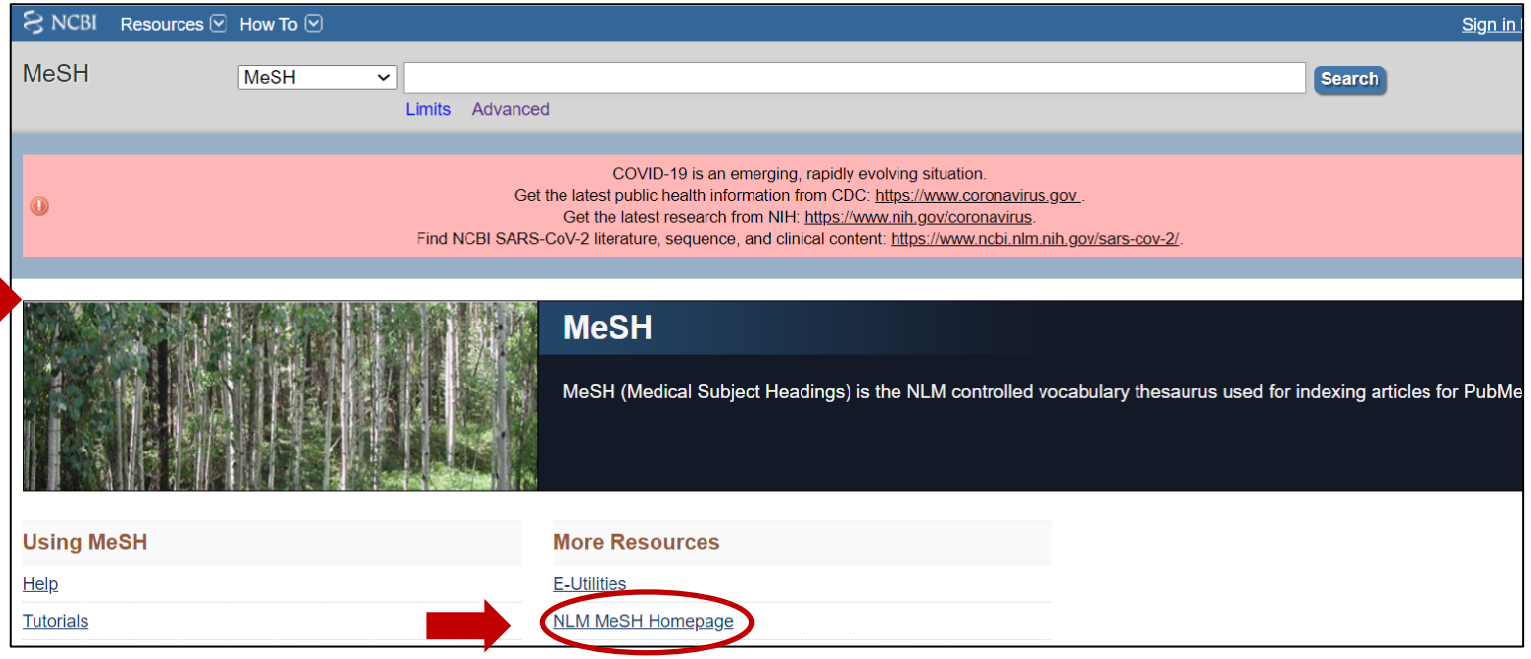
MESH – Medical Subject Headings

- Bibliographic databases deal with language variation by means of controlled vocabularies where each concept points to one specific term, regardless of the word choice made by the authors: this gives consistency to the indexing of literature
- The Medical Subject Headings (MeSH) thesaurus is the controlled vocabulary produced by the National Library of Medicine used for indexing and searching biomedical and health-related information. It provides a consistent way to find content with different terminology but the same concepts.
- The MeSh is hierarchically organized in a "tree" with 19 main branches pointing to very general concepts that give rise to progressively smaller branches pointing to more and more specific concepts
- The Mesh vocabulary is updated every year
- To know more: Learn about Medical Subject Headings (MeSH)

MESH vocabulary



The Mesh vocabulary – Medical Subject Headings can be accessed from the link in Pubmed Home page



Details and updates

MeSH Tree Structure

- Analytical, Diagnostic and Therapeutic Techniques and Equipment
- Anatomy
- Anthropology, Education, Sociology and Social Phenomena
- Check Tags
- Chemicals and Drugs
- Disciplines and Occupations
- Diseases
- Geographical Locations
- Health Care
- Humanities
- Information Science
- Organisms Category
- Persons
- Pharmacological Actions
- Phenomena and Processes
- Psychiatry and Psychology
- Publication Type
- Subheadings
- Technology and Food and Beverages

What's in the Medical Subject Headings

- Each bibliographic record is assigned 5 -15 headings including:
- Concept terms found in the article (main Headings)
- Subheadings: qualifiers that may be attached to MeSH headings to describe a specific aspect of a concept
- Age group
- Human vs animal
- Article type (e.g. Review, Clinical trial, Comment, …)
- Substances: chemical substances, drugs
- Supplementary concepts: primarily substance terms, but also protocols, some virus terms and rare disease terms …

More on Mesh vocabulary

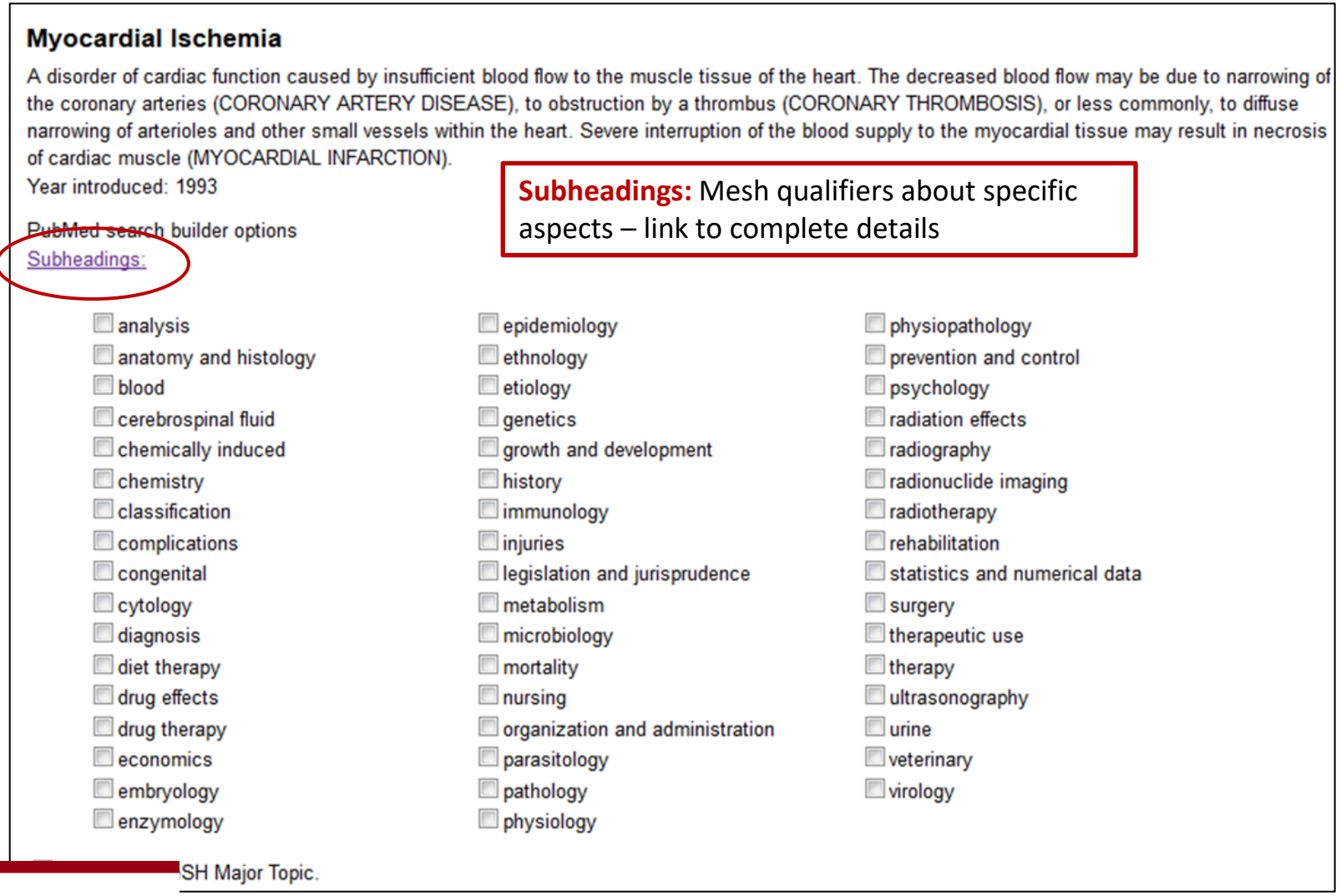
- **See Also**: searching suggestions involving related terms, often in different branches of the Mesh tree

- **Two dates in Scope note**: e.g. Influenza, human Year introduced: 2006 (1963) = the term, introduced in 2006 can be searched back since 1963.

- **Previous indexing** indexing previously used and still useful for records before the date of introduction of the new Mesh indicated in the Mesh scope note

- **Supplementary concepts:** primarily substance terms, but also protocols, some virus terms and rare disease terms. Daily updated, they may become Mesh terms

Mesh example -1



Myocardial Ischemia

A disorder of cardiac function caused by insufficient blood flow to the muscle tissue of the heart. The decreased blood flow may be due to narrowing of the coronary arteries (CORONARY ARTERY DISEASE), to obstruction by a thrombus (CORONARY THROMBOSIS), or less commonly, to diffuse narrowing of arterioles and other small vessels within the heart. Severe interruption of the blood supply to the myocardial tissue may result in necrosis of cardiac muscle (MYOCARDIAL INFARCTION).

Year introduced: 1993

PubMed search builder options

Subheadings:

- analysis
- anatomy and histology
- blood
- cerebrospinal fluid
- chemically induced
- chemistry
- classification
- complications
- congenital
- cytology
- diagnosis
- diet therapy
- drug effects
- drug therapy
- economics
- embryology
- enzymology
- epidemiology
- ethnology
- etiology
- genetics
- growth and development
- history
- immunology
- injuries
- legislation and jurisprudence
- metabolism
- microbiology
- mortality
- nursing
- organization and administration
- parasitology
- pathology
- physiology
- physiopathology
- prevention and control
- psychology
- radiation effects
- radiography
- radionuclide imaging
- radiotherapy
- rehabilitation
- statistics and numerical data
- surgery
- therapeutic use
- therapy
- ultrasonography
- urine
- veterinary
- virology

SH Major Topic.

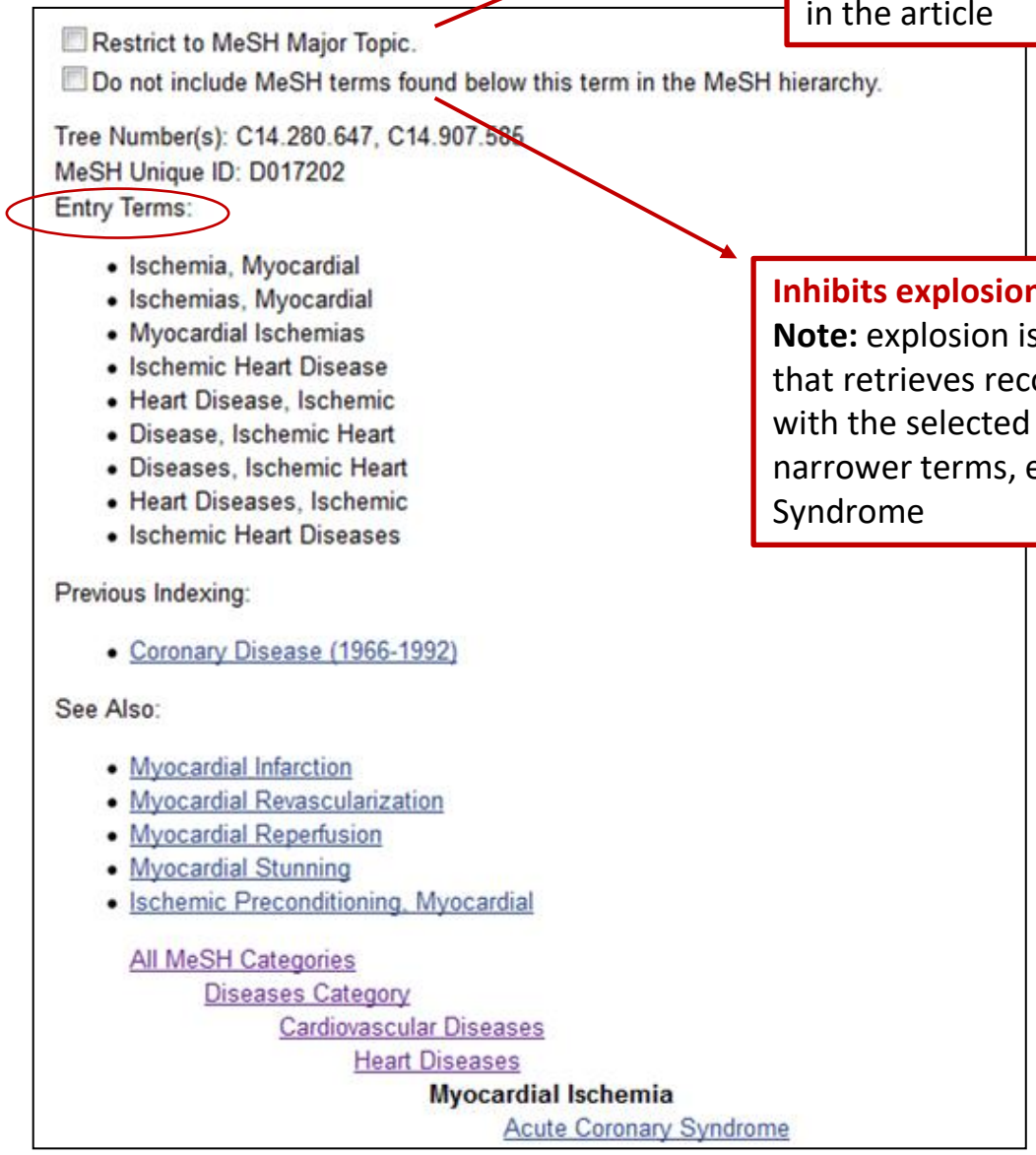
Subheadings: Mesh qualifiers about specific aspects – link to complete details

Scope note: useful Mesh term searching information, not always a defintion

N.B. Subheadings, like Mesh headings they are in a hierarchy with more specific qualifiers which are searched by explosion https://www.nlm.nih.gov/mesh/subhierarchy.html

Mesh example - 2

Entry terms: synonyms, near-synonyms, alternate forms, and other closely related terms to the preferred Mesh, generally used interchangeably with it for the purpose of retrieval.
In this example, Ischemic Heart Disease brings to Myocardial Ischemia, the preferred term



Major topic: for retrieval of records in which the heading is a main subject in the article

Inhibits explosion:
Note: explosion is the default option that retrieves records indexed both with the selected Mesh and its narrower terms, e.g. Acute Coronary Syndrome

Searching with Mesh terms

1. Select Mesh term ➡ 2. Add to search builder ➡ 3. Search Pubmed

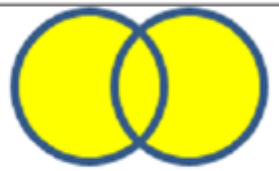
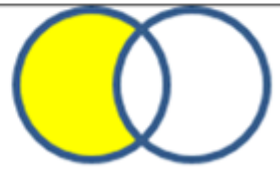
Options:

- **Restrict to MeSH Major Topic** (retrieves records having the selected term as a main concept)
- **Do not include MeSH terms found below this term in the MeSH hierarchy** (inhibits explosion, that is the retrieval of records indexed with narrower headings)
- **Subheadings selection** (qualifiers that address search to specific aspects)

N.B. : the search strategy can be built in the Mesh vocabulary box.
Alternatively, single searches can be combined in the Advanced search page applying boolean operators

Boolean operators

Boolean operators help focus or expand bibliographic searches

AND	Bronchitis **AND** smoking	 Both terms are included in each record
OR	Binge-eating disorder **OR** bulimia nervosa	 At least one of the terms is included in each record
NOT	Psychotropic drugs **NOT** antidepressive agents	 Records including the term after NOT are excluded

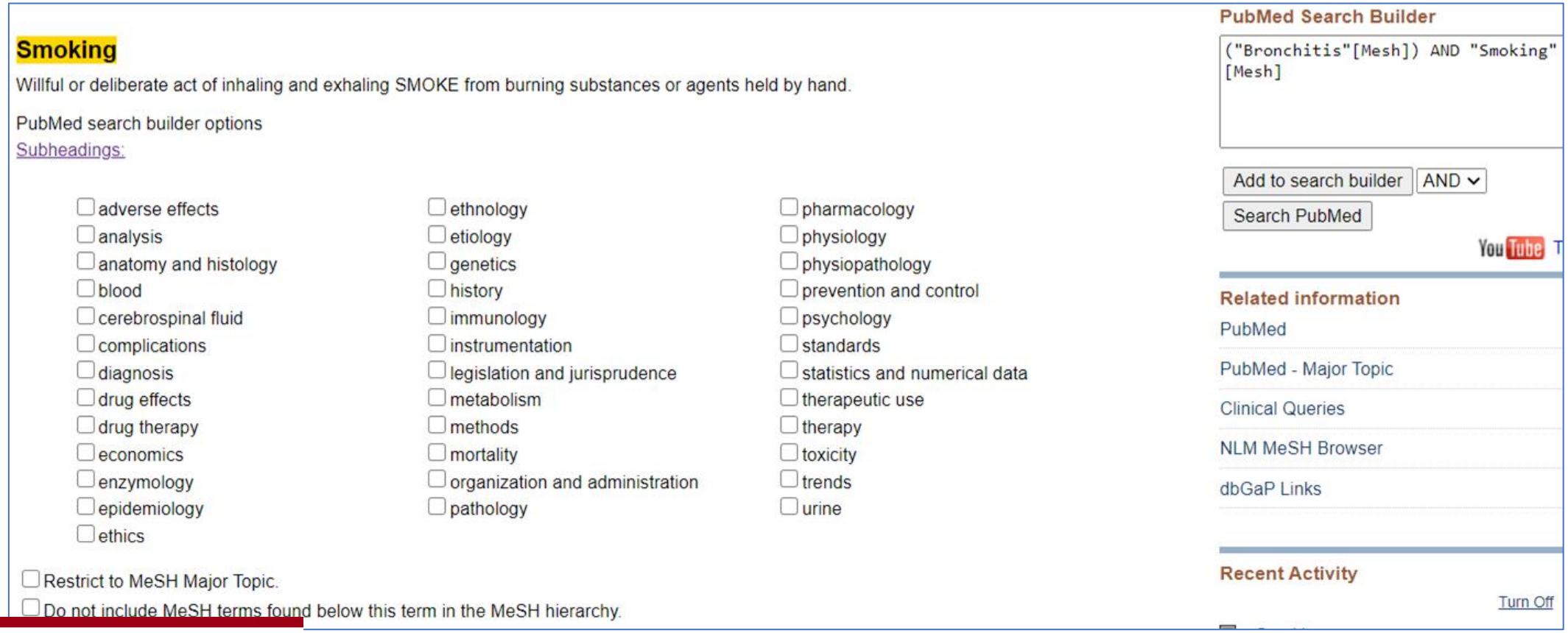
Boolean must be typed in capital letters to avoid confusion with stopwords (usually prepositions, articles, connectors, …)

Note: Use **NOT** with caution to avoid missing citations including a search term included in the same records containing the term that must be escluded

Searching with boolean operators, example

Correlation between bronchitis amd smoking:

- Search 1° term -> Add to search builder (AND is the default operator that can be changed)
- Search 2° Mesh term -> Add to search builder
- Search Pubmed



Nesting -1

Nesting (grouping of terms) allows to correctly interpret a search in which more boolean operators are necessary

Example:

Informed consent standards in Italy, Spain, France

1^ concept: Informed consent standards

AND

2^ concept: Italy or Spain or France: to be considered collectively

Each record will contain at least one of the three elements which will be combined with OR and enclosed in round brackets

as follows:

"Informed Consent/standards"[Mesh] AND ("Italy"[Mesh] OR "France"[Mesh] OR "Spain"[Mesh])

Nesting -2

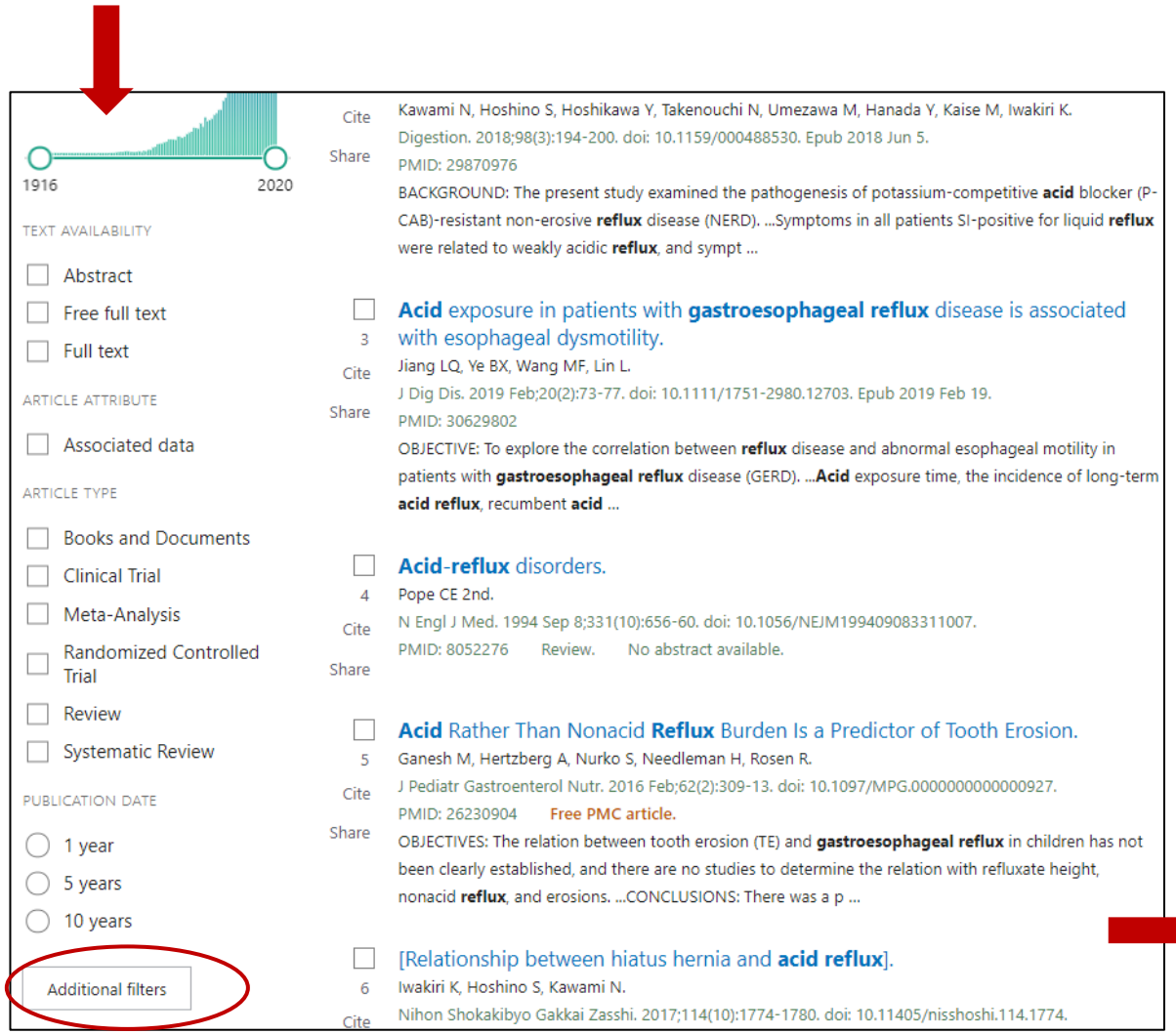
- Nesting of terms is useful when a concept can be expressed in several ways, especially if an appropriate Mesh term is missing or not applicable, like searching among non-indexed records.
- Round brackets enclose related tems, like synonims or terms to be considered as a whole
- Nesting terms tells the database to look for terms in the parentheses first where they are connected with OR operator, and then AND is applied to connect the like terms to the rest of the search.
- For example, in the nested search below, the database will first find any of the words in parentheses and then look for the second term “depression”

(teenager* OR " teen" OR adolescen* OR "youth " OR "young adult") AND depression

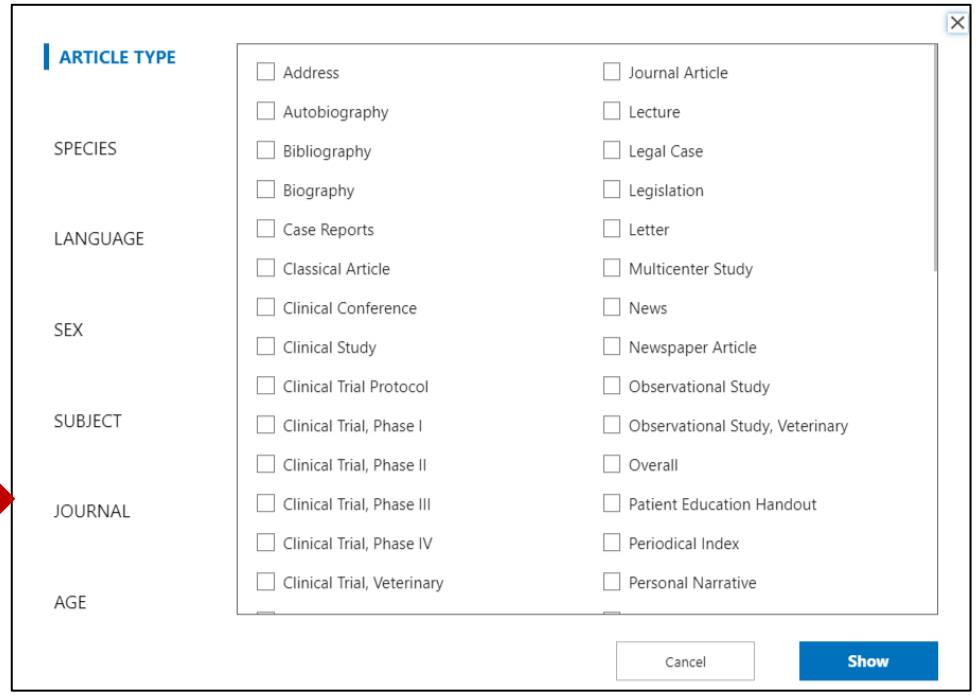
[Note: in the example above an asterisk and inverted commas are used which will be dealt with subsequently]

- Nesting is also used when we are interested in different aspects of a concept, e.g. the analysis of both syntoms and treatment of a disease (symptoms OR treatment) AND schizophrenia

Filters- 1



N.B. Most filters only apply to indexed records (Medline subset – records with Mesh headings) because most filters are Mesh elements.
N.B. Review can be applied to any record as it is preliminary attributed by the publisher



Filters - 2

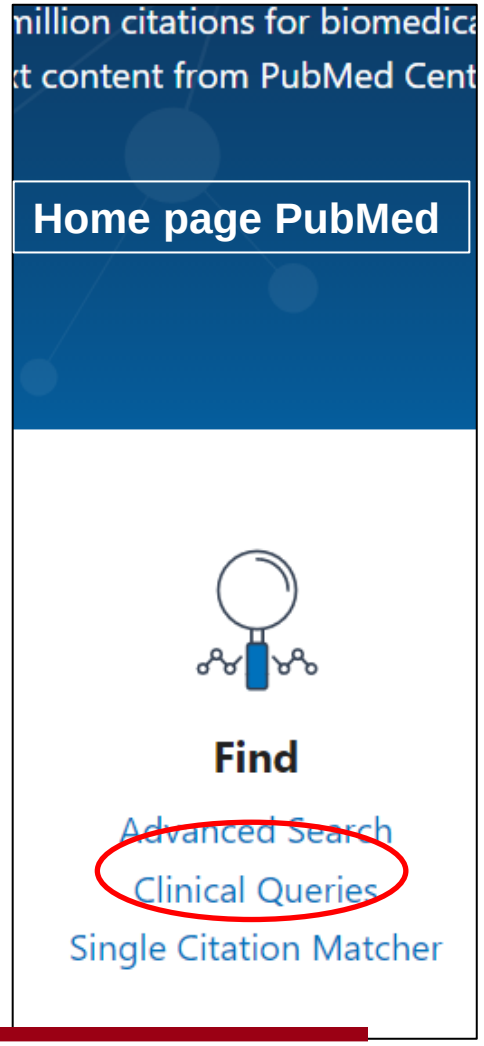
How to apply a filter:

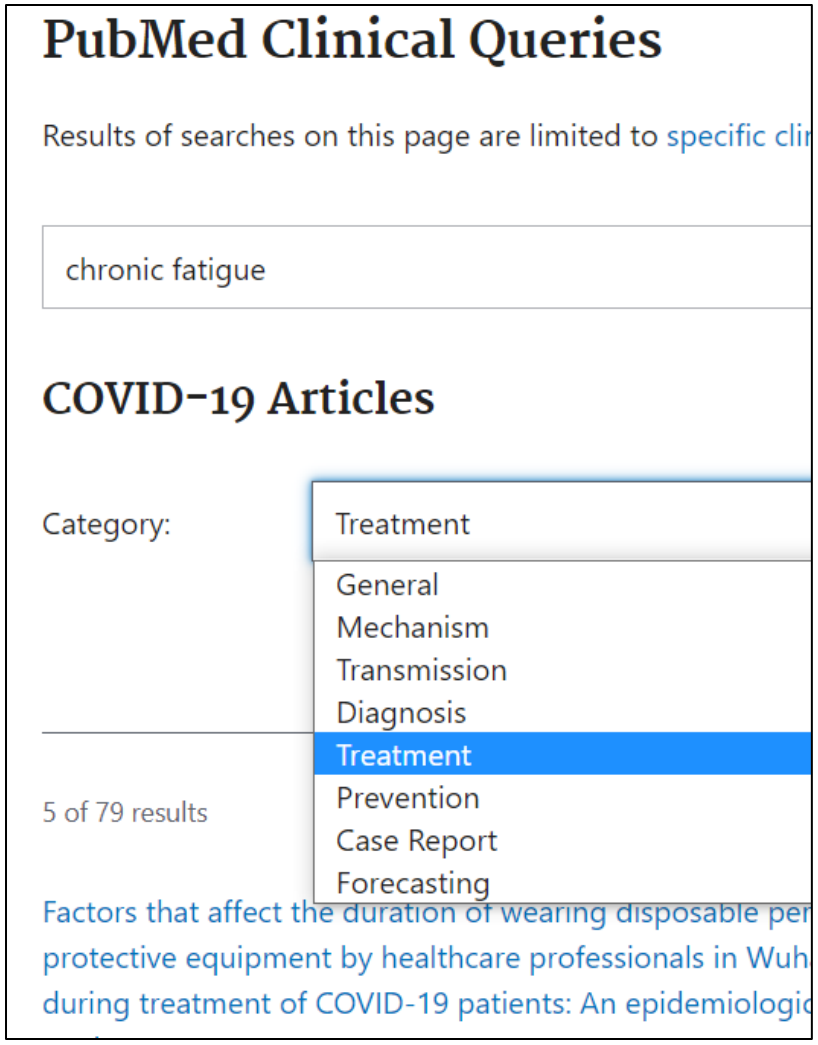
- Run a search
- Apply filters from sidebar
- More filters can be displayed from Additional filters (a pop-up menu will appear showing the available filters for each category; choose category, select filter, click Show, select it from side bar)

N.B. The filters will apply to further searches, if not turned off.

- If a category is to be excluded, a filter can be applied using NOT, i.e.. (("Bronchitis"[Mesh]) AND "Air Pollution"[Mesh]) NOT ("Aged"[Mesh])
- For details about filters also applicable to non-indexed records and search fields not listed in Pubmed Subject filters, see: https://www.nlm.nih.gov/psd/special_queries.html
- Covid and Clinical queries: see next
- More filters can be pemanenty set up in My NCBI filters

Using Covid-19 filter

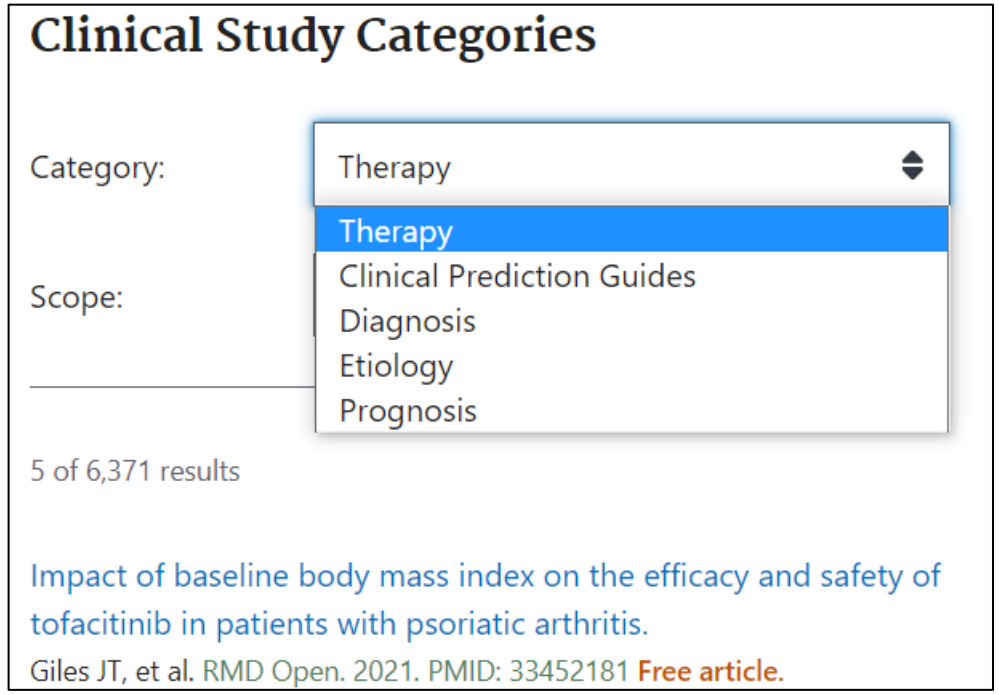


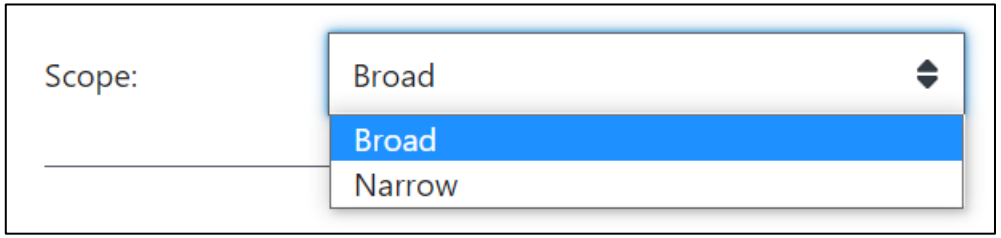


- From Clinical Queries in Pubmed home page
- COVID-19 filter limits results retrieval to Covid-19 citations
- Build your query in the search box -> Search
- Select a category: General, Mechanism, Transmission, Diagnosis, Treatment, Prevention, Case Report, or Forecasting
- Results preview is in Covid-19 filter column
- For all results, see link See all at the bottom
- Covid-19 filter details: the filter may evolve over time

Clinical queries

- The Clinical queries filter limits retrieval to citations resulting from studies conducted according to specific clinical research methods: Filter details
- Build your query in the search box -> Search
- Select a **category:** Therapy, Diagnosis, Etiology, Prognosis, or Clinical Prediction Guides
- Select from **Scope**: Broad or Narrow depending on sensitivity/specificity required
- For all results, see link See all at the bottom
- **Note**: **Using PubMed in Evidence-Based Practice** Training course





PubMed special queries no longer available

[Pubmed special queries: directory of topic specific Pubmed queries]

Details of search strategies in areas not included in the **Subject** list of Pubmed **Additional filters**

Subjects	Description
AIDS	Limits search to the PubMed AIDS subset. View search strategy.
Bioethics	A PubMed Bioethics subset search. View search strategy. See also Bioethics Information Res
Cancer	Limits search to the PubMed Cancer subset. View search strategy.
Complementary Medicine	Limits search to the PubMed Complementary Medicine subset. View search strategy.
Developmental and Reproductive Toxicology (DART)	A PubMed Developmental and Reproductive Toxicology search. View search strategy.
Dietary Supplements	Limits search to the PubMed Dietary Supplements subset. View search strategy.
Health Disparities	A PubMed Health Disparities search. View search strategy. See also Health Disparities Inform
Health Literacy	A PubMed Health Literacy search. View search strategy. See also links to other Health Literac
History of Medicine	Limits search to the PubMed History of Medicine subset. View search strategy.

How to apply the filters in the list

[PubMed Subject Filters]

Bioethics
This strategy was created by NLM and the Kennedy Institute of Ethics, Geo
also be used in a search as bioethics [sb].
Example: euthanasia AND bioethics [sb]

Cancer
This strategy uses terms from the Neoplasms (and related) branches of Me
National Cancer Institute to facilitate searching for subjects in all areas of
[sb].
Example: survivors AND cancer [sb]

Complementary Medicine
This strategy was created using terms from the Alternative Medicine branc
Center for Complementary and Integrative Health (NCCIH), NIH. It is provid
filter can also be used in a search as cam [sb].
Example: osteoarthritis AND cam [sb]

Developmental and Reproductive Toxicology (DART)
This strategy was created to facilitate searching for subjects in the area of
used in a search as dart [sb].
Example: mercury AND dart [sb]

Dietary Supplements
This strategy was developed jointly by NLM and the Office of Dietary Supple
broad spectrum of dietary supplement literature. This filter can also be use
Example: anemia AND dietsuppl [sb]

Note that the filters above do not work any more. The links shown lead to an archived page that may be useful as examples of search strategies

Simple search – Best Match

- Pubmed uses a relevance search algorithm, **Best Match**, that retrieves the most important records at the top of results following a simple query
- It works in a similar way to other search engines which, based on usage analyses and statistics, recognizes that most users don't scroll results beyond the first page
- One of the goals of Best Match is to make sure that the most relevant results are displayed in the top positions
- The search engine has been created so that a query search simply fomulated will be translated into a more complex one that can bring the most relevant results
- Pubmed also includes tools for accurate searching and refinement of results
- In practice: a search can be conducted in a simple way, just type in the subject of interest without worrying about syntax, punctuation, boolean operators, controlled vocabulary …

Best Match default sorting is useful for a quick search that yields the most relevant results or as a starting point that, based of the first results analisys, triggers a more accurate and controlled search

How Pubmed works: Automatic Term Mapping (ATM)

When untagged terms are entered in the search box, Automatic Term Mapping occurs: the terms are matched against translation tables (including all Mesh elements, journal title, author, and investigation index). If a match is found the search stops

If a Mesh term is found, it will be searched as a Mesh heading (along with its narrower terms: explosion, in All fields as they are (as exact phrase in inverted commas), and as single terms combined with AND

- E.g.1:asthma -> "asthma"[MeSH Terms] OR "asthma"[All Fields] OR "asthmas"[All Fields] OR "asthma s"[All Fields]
- E.g.:2: physical activity -> "exercise"[MeSH Terms] OR "exercise"[All Fields] OR ("physical"[All Fields] AND "activity"[All Fields]) OR "physical activity"[All Fields]

To view the search translation, see **Search Details** in the Advanced page, next to the query

For Automatic Term Mapping details, see https://pubmed.ncbi.nlm.nih.gov/help/#automatic-term-mapping

Search details: how a search is translated

Click **Details** to see automatic term mapping and how your search has been translated

PubMed Advanced Search Builder

PubMed.gov

User Guide

Add terms to the query box

All Fields | Enter a search term | ADD

Show Index

Query box

Enter / edit your search query here | Search

History and Search Details

Download | Delete

Search	Actions	Details	Query	Results	Time
#8	•••	›	Search: **physical activity**	579,246	07:30:06
#6	•••	⌄	Search: **asthma** "asthma"[MeSH Terms] OR "asthma"[All Fields] OR "asthmas"[All Fields] OR "asthma s"[All Fields] **Translations** **asthma:** "asthma"[MeSH Terms] OR "asthma"[All Fields] OR "asthmas"[All Fields] OR "asthma's"[All Fields]	194,354	07:24:09

Best Match vs Mesh search

- A uninformed search based on Best Match may be enough if what is needed is just a few relevant records on a subject of interest
- Best Match may interpret your search in a different way than intended: this must be checked on Search details
- Some records retrieved may not be relevant as the automatic term mapping may have yielded records containing the searched terms combined with AND and inconsistent with the search goal
- If you find that the results retrieved do not reflect the goal of your search, try a different wording
- For an accurate search, examine the first records in Best Match sorting, find useful Mesh terms that define your search concepts, if available, and then start a new search based on Mesh vocabulary
- If Mesh terms are missing for your search concepts, a free text search must be performed
- **Note**: A Mesh based search only retrieves indexed records: for a comprehensive search including non indexed records, a free text search will complete your search

When the Mesh vocabulary is not helping: free text search

If:

- I do not know the appropriate Mesh terms (let's find out)
- An appropriate Mesh term does not exist or it is not specific enough (let's find out all appropriate synonims and combine them with OR)
- I am searching non-indexed materials (records with status other than "indexed for Medline ", e.g. most recent articles and other records excluded from indexing)

then:

- Best match – simple and spontaneous start useful to carefully examine the records in the first positions and check Search Details
- ATM (automatic term mapping) = help find consistent Mesh terms for an accurate search
- Phrase searching in double quotes: mandatory if Mesh is missing or a suitable option either to find the appropriate Mesh term to start a search or to complete a search done with Mesh in order to also find non-indexed materials on the subject
- Search by field strategies

Phrase search, truncation and stopwords

Free text without punctuation

heart attack

Search details: "myocardial infarction"[MeSH Terms] OR ("myocardial"[All Fields] AND "infarction"[All Fields]) OR "myocardial infarction"[All Fields] OR ("heart"[All Fields] AND "attack"[All Fields]) OR "heart attack"[All Fields]

Exact phrase (in inverted commas)

"heart attack"

Search details: "heart attack"[All Fields]

Truncation (asterisk on the term root – **at least 4 letters are needed**):

To search for all variables terms that begin with a word root

surg* -> Search details: "surg*"[All Fields]

Note: Inverted commas and truncation inhibit automatic term mapping, the exact expression as written will be searched in All fields, but there will be non suggestions of suitable Mesh terms

STOPWORDS: frequently used words not taken into account by search engines, usually prepositions, conjunctions, articles …

Completing a search conducted with Mesh: some tips

1. AAA[Mesh] AND BBB[Mesh]*"sinonimo 3 di AAA" … etc.*
2. Apply filters

Then:

Complete the search already conducted with Mesh vocabulary to retrieve non indexed records:

" AAA" OR *" AAA synonim-1 "* OR *"AAA synonim-2 "* OR *" AAA synonim-3 " … etc.*

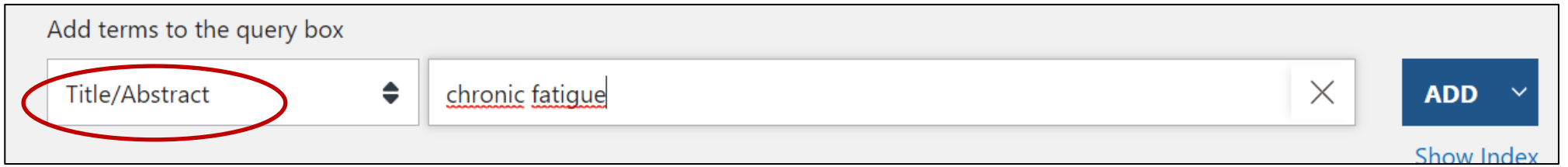
AND

" BBB" OR *" BBB synonim -1 "* OR *" BBB synonim -2"* OR *" " BBB synonim -3" … etc.*

Note: Most filters, being mesh headings, must be expressed with free text and synonims, e.g. elderly population:

" aged" OR "elderly" OR " old age" OR … etc.

It may be useful to limit search to the most relevant fields, i.e. Title and Abstract (see: Field searching)

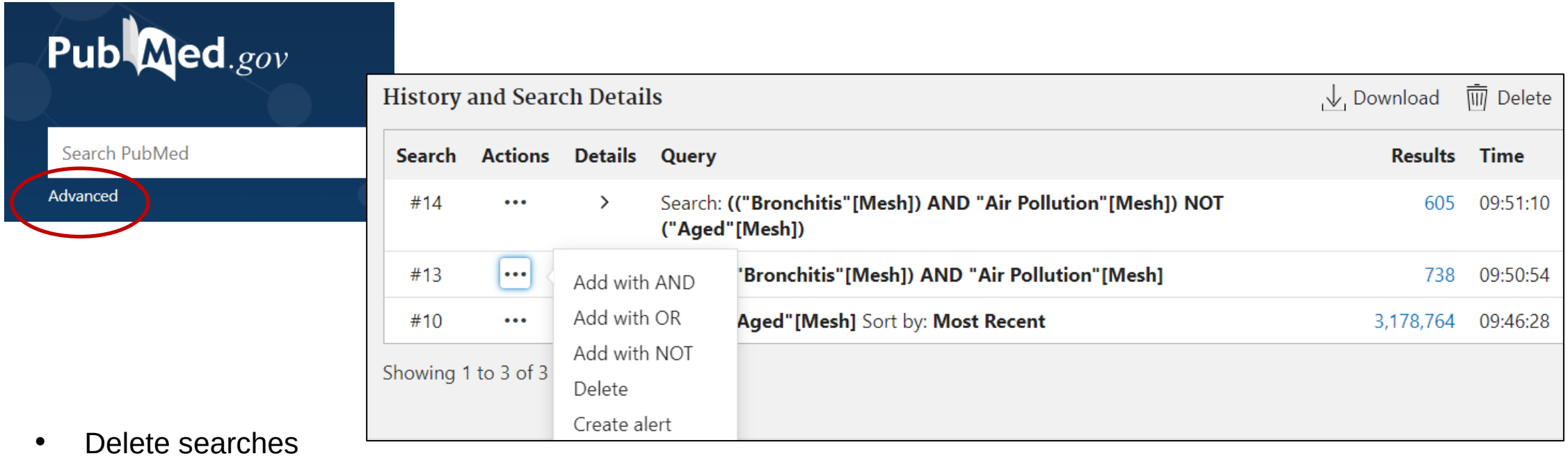


Note: what is not apparent with phrase searching is that more specific terms are **not** retrieved **, unlike** a Mesh search which by default occurs with Explosion of Mesh terms

Advanced search - 1

Advanced (under Pubmed search box in home page) links to a page where users can:

- Search for terms in a specific field (e.g.Title, Journal…, Title/abstract), that may be accompanied by Show Index - an alphabetical display of terms appearing in selected PubMed search field
- History: searches may be seen in detail and combined with the appropriate boolean operators

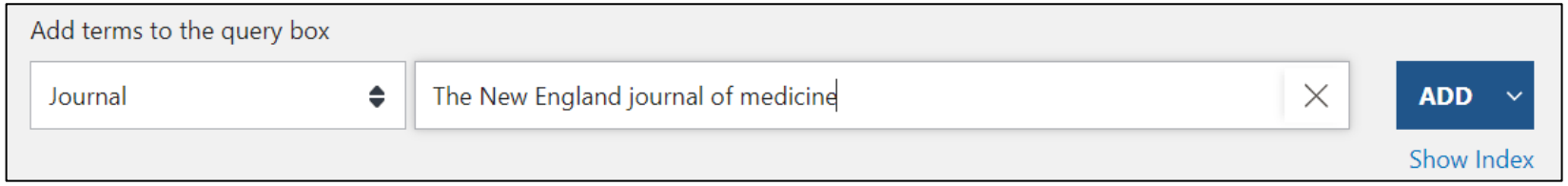


- Delete searches
- Access to the searches by clicking on the number of results
- Create an alert for the selected search, that is, the search strategy is saved so that it can be re-run for the purpose of updates (Note: **Create alert** is also found under the search box in Pubmed home page)

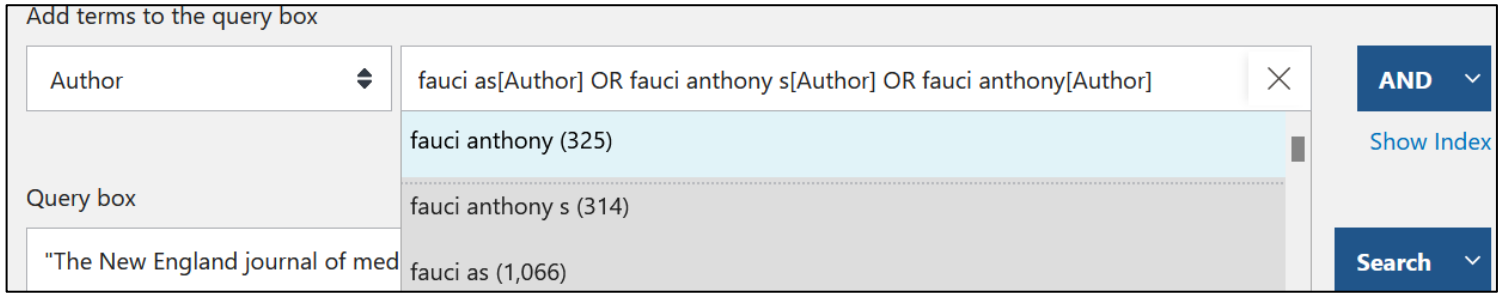
Advanced search – 2: searching by a specific field

E.g.. Serching for articles with Anthony Fauci as author published in the New England Journal of Medicine

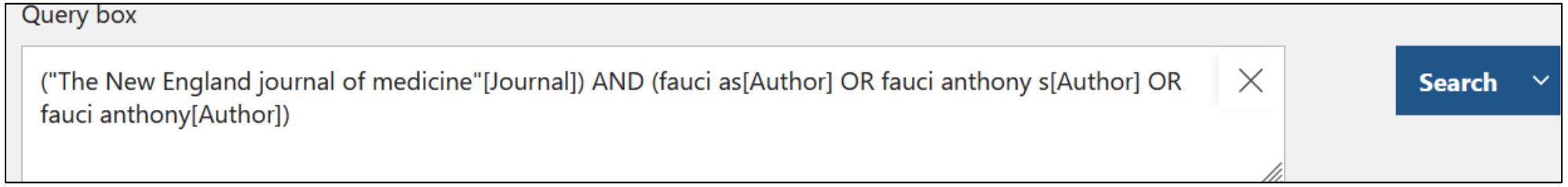
- Select field **Journal** -> Write/select journal title-> -> Click **ADD**



- Select field **Author** -> Write/select author (use Ctrl+Alt to select more name variations) -> Click **AND**



Final search strategy

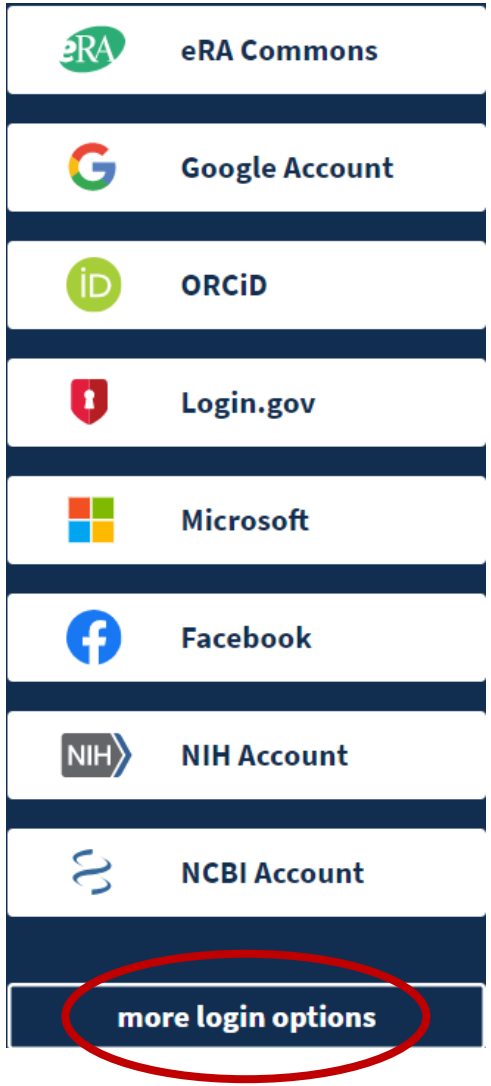


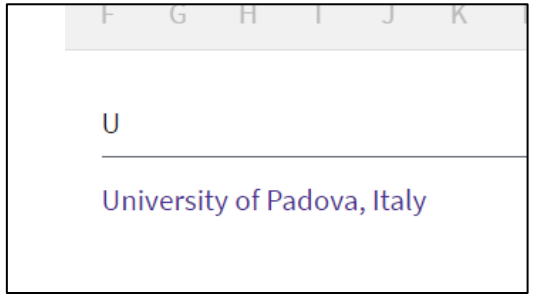
Sign up in NCBI for a personal space

First **Log in** on the top right corner in Pubmed home page

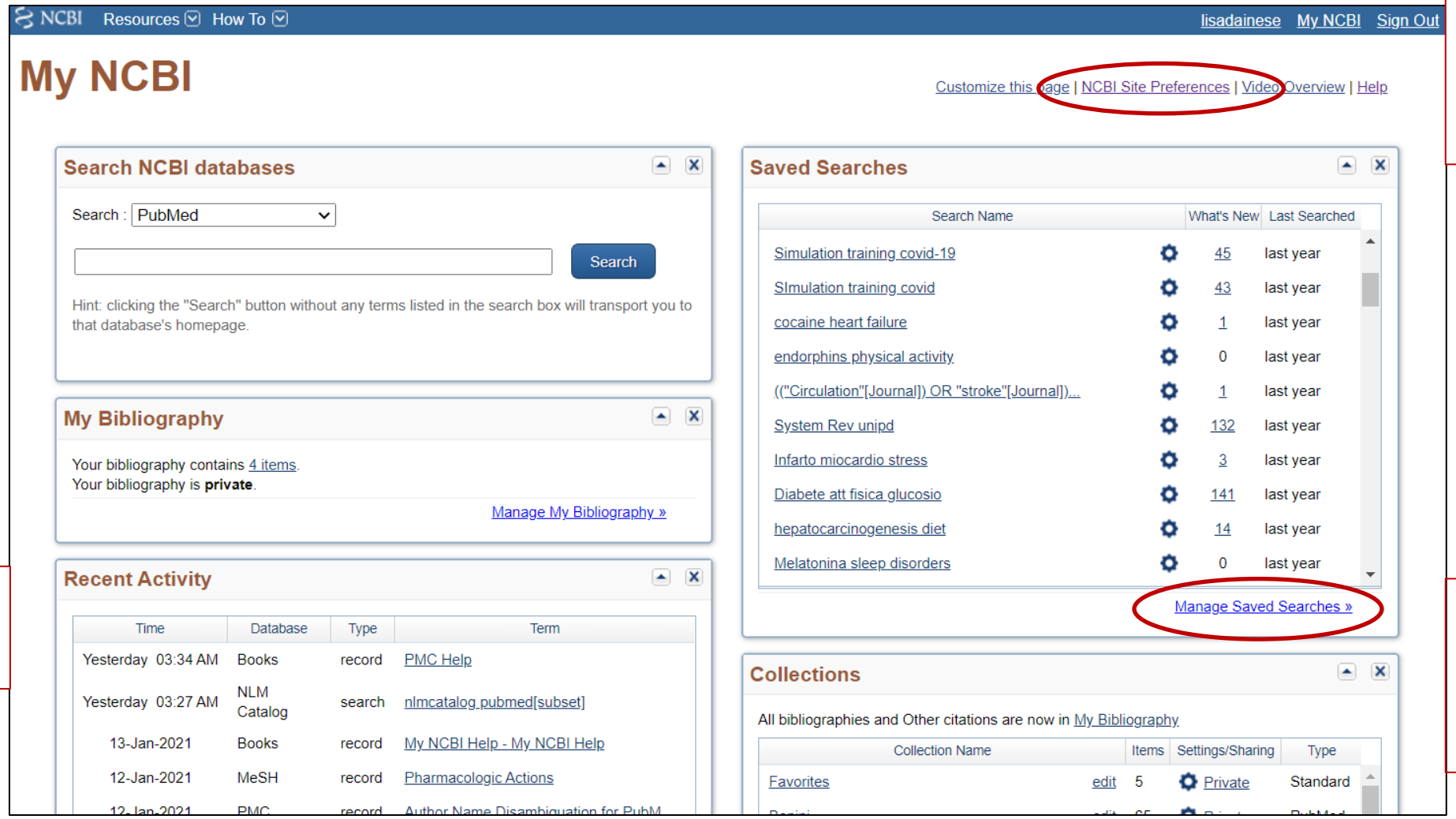
Why:

- To create and store **collections** indefinitely
- To check updates of Search strategies saved from **Create alert**
- To keep track of one's activity over the last 6 months: this makes it convenient to log in when searching Pubmed
- To set up personal preferences





MyNCBI



Recent activity keeps track of 6 months activity

NCBI site preferences -> Highlighting -> select color to highlight searched terms

Manage saved searches to check search updates -> What's new

A brief tutorial :
https://www.nlm.nih.gov/oet/ed/pubmed/quicktours/alerts/index.html

Bibliography and useful links

- Pubmed online training
- Medical Subject Headings (MeSH®) in MEDLINE®/PubMed®: A Tutorial
- Learn about Medical Subject Headings (MeSH)
- https://learn.nlm.nih.gov/documentation/training-packets/T0042010P/
  Le voci Quick tours e Tutorials portano a brevi moduli didattici su singoli aspetti della ricerca in Pubmed
- Breve tutorial su MyNCBI: https://www.nlm.nih.gov/oet/ed/pubmed/quicktours/alerts/index.html
- PubMed special queries: https://www.nlm.nih.gov/psd/special_queries.html
- Pubmed Subject filters
- Using PubMed in Evidence-Based Practice Training Course
- Fiorini N, Canese K, Starchenko G, Kireev E, Kim W, Miller V, Osipov M, Kholodov M, Ismagilov R, Mohan S, Ostell J, Lu Z. Best Match: New relevance search for PubMed. PLoS Biol. 2018 Aug 28;16(8):e2005343. doi: 10.1371/journal.pbio.2005343. PMID: 30153250; PMCID: PMC6112631.

NLM web portal is being updated, links might change

Introduction to Pubmed – April 2022
Lisa Dainese – Biblioteca Medica Centrale V.Pinali - Uiversità degli studi di Padova