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Introduction to

PubMed

April 2022 update

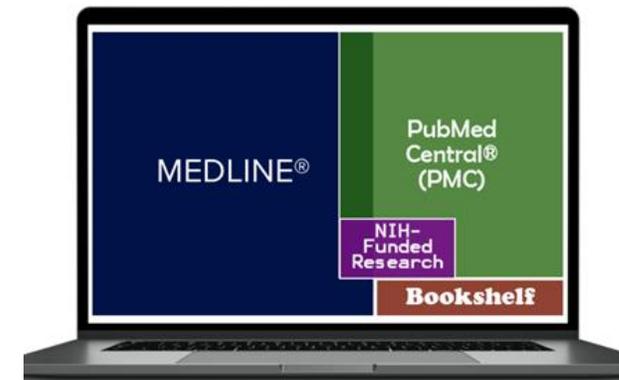
Lisa Dainese
lisa.dainese@unipd.it

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
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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  icon)

The new Pubmed

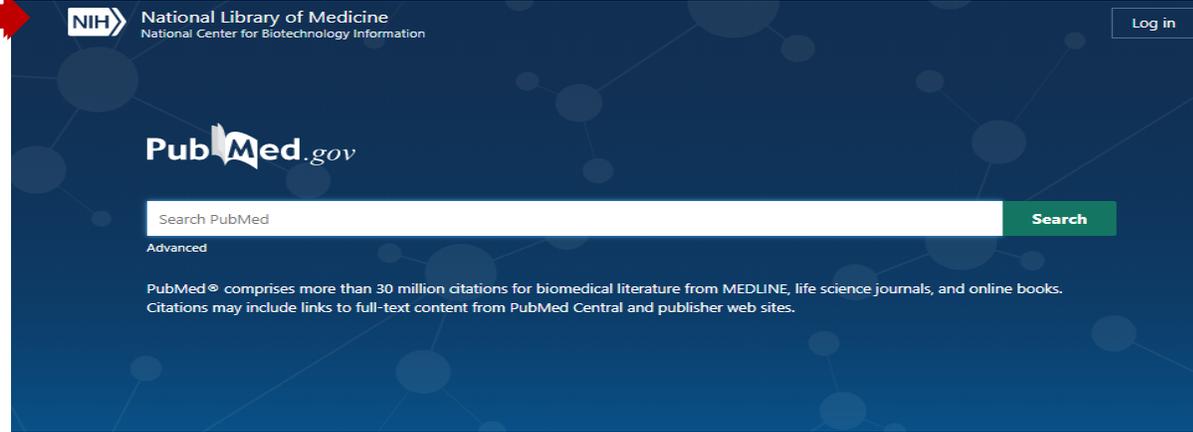
- Launched in november 2019, it has become the default interface since May 2020

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


Learn
About PubMed
FAQs & User Guide
Finding Full Text


Find
Advanced Search
Clinical Queries
Single Citation Matcher


Download
E-utilities API
FTP
Batch Citation Matcher


Explore
MeSH Database
Journals
Legacy PubMed (available until at
least 9/30/2020)

Mesh Database
Link to Medical Subject
Headings, medical
controlled vocabulary

Trending Articles
Articles with a
recent growth in
interest

Trending Articles

Latest Literature

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

Publication type: if specified

Author: affiliation details

PMID: Pubmed standard identifier for each record

Abstract often structured

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

External links for article retrieval

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

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

 GO

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

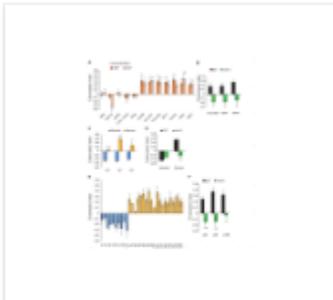


Fig 1. *C. elegans* can respond...

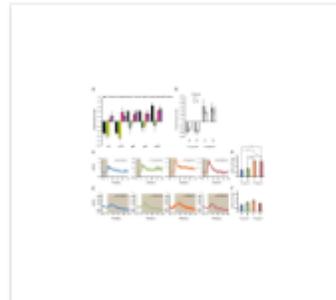


Fig 2. Olfactory neurons of *C. elegans*...

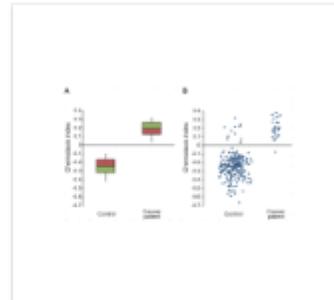


Fig 3. NSDT of 242 urine samples.

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.

1882465 [Free PMC article.](#)

Figures

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Publication types

MeSH terms

Substances

Grant support

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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/VMR.S148594. eCollection 2017.
PMID: 30050858 [Free PMC article.](#)

[Show more "Cited by" articles](#) [See all "Cited by" articles](#)

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](#)
[Biomarkers, Tumor / urine*](#)

[Rivaroxaban](#)
[Aspirin](#)

Associated data

[ClinicalTrials.gov/NCT01776424](#)

Related information

[MedGen](#)
[PubChem Compound \(MeSH Key\)](#)

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

Associated Data
Link to secondary source databanks, such es. [ClinicalTrials.gov](#), [GenBank](#), [Figshare](#), etc.

Associated data

[GEO/GSE39085](#)

Related information

[Cited in Books](#)
[GEO DataSet Links](#)

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

This research was supported by a JSPS Grant-in-aid for Young Scientists (A), Grant-in-Aid for Scientific Research (C), Senri Life Science Foundation, Inamori Foundation, The Kurata Memorial Hitachi Science and Technology Foundation, The Japan Health Foundation, Mishima Kaiun Memorial Foundation and Kyushu University Interdisciplinary Programs in Education and Projects in Research Development (Type E-4, 24425). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

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) attributed 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

The screenshot shows the PubMed search results page for the query "acid reflux". At the top, there is a search bar with the text "acid reflux" and a "Search" button. Below the search bar are links for "Advanced", "Create alert", "Create RSS", and "User Guide". There are also buttons for "Save", "Email", and "Send to". The results are sorted by "Best match" and there is a "Display options" button. On the left side, there are filters for "MY NCBI FILTERS" (All (37,754), clinical trial (2,716), Free Full Text (8,493), Review (7,291)), "RESULTS BY YEAR" (a bar chart showing results from 1916 to 2020), "TEXT AVAILABILITY" (Abstract, Free full text, Full text), "ARTICLE ATTRIBUTE" (Associated data), and "ARTICLE TYPE" (Books and Documents, Clinical Trial, Meta-Analysis, Randomized Controlled Trial, Review). The main results list shows four entries, each with a checkbox, a title, a citation, and a "Share" button. The second entry, "Pathogenesis of Potassium-Competitive Acid Blocker-Resistant Non-Erosive Reflux Disease", has its "Cite" and "Share" buttons circled in red.

This is a close-up of the "Display options" menu. It shows a dropdown menu for "Format" with "Summary" selected. Other options in the dropdown are "Abstract", "PubMed", and "PMID". There is also a "Sort by" dropdown, a "Per page" dropdown, and a "Show snippets" checkbox which is checked.

Snippet: significant fragment from the article abstract

Results management– some formats and options

SAVE

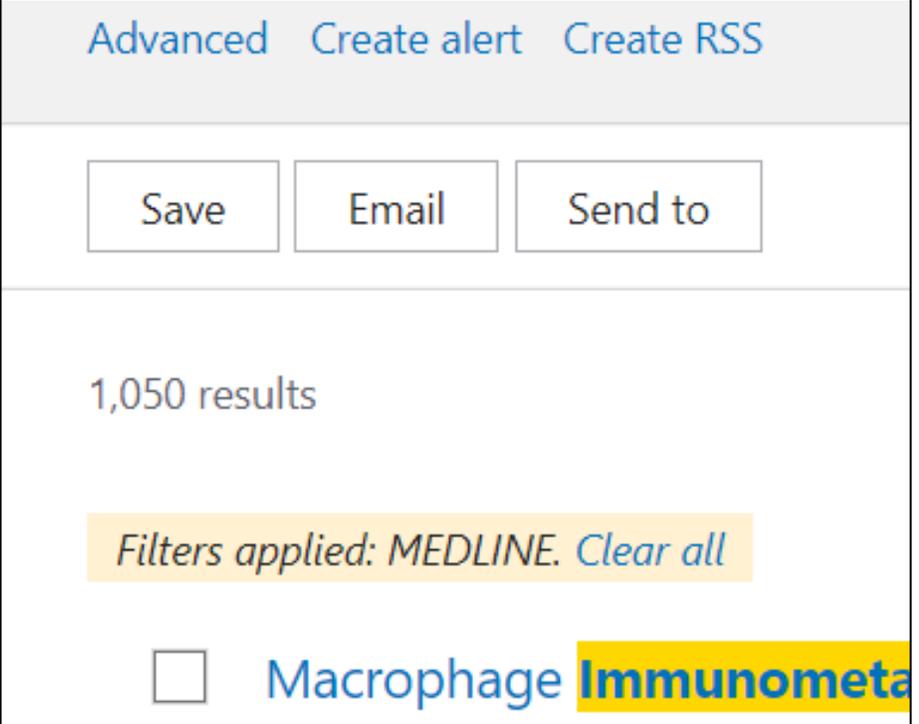
- **Pubmed:** text format including all fields and citation status
- **Abstract:** text format including abstract, limited number of fields
- **CSV:** useful to manage a high number of records, e.g. literature reviews

EMAIL

- **Abstract:** html format where  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.



Advanced Create alert Create RSS

Save Email Send to

1,050 results

Filters applied: MEDLINE. Clear all

Macrophage Immunometabolism

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

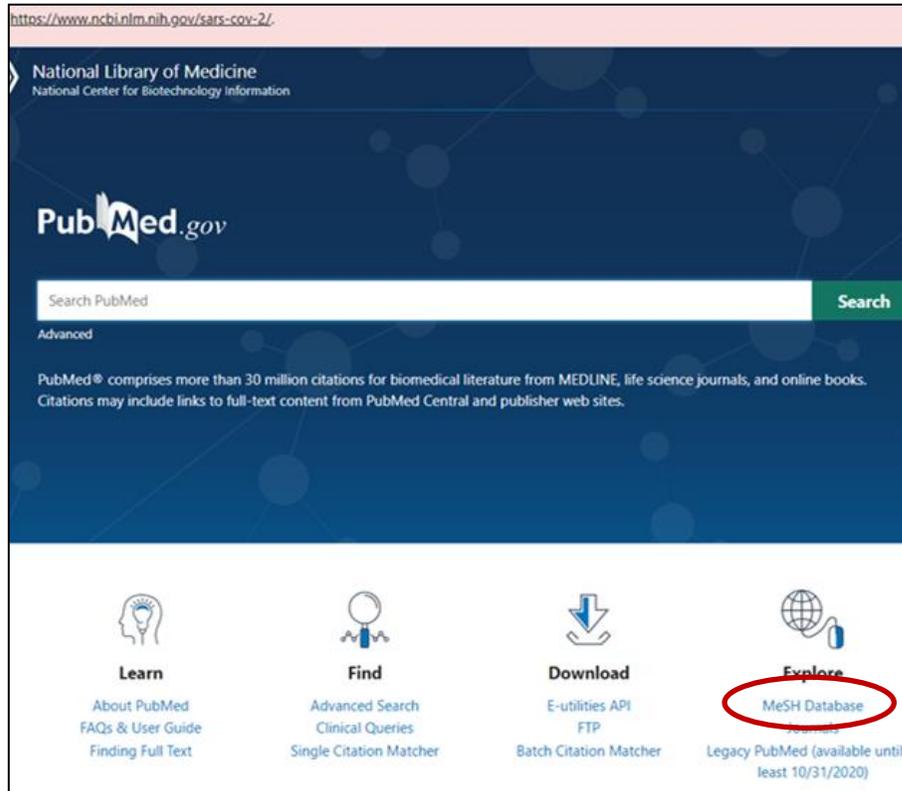
Indexing – when a record is added to PubMed

- 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

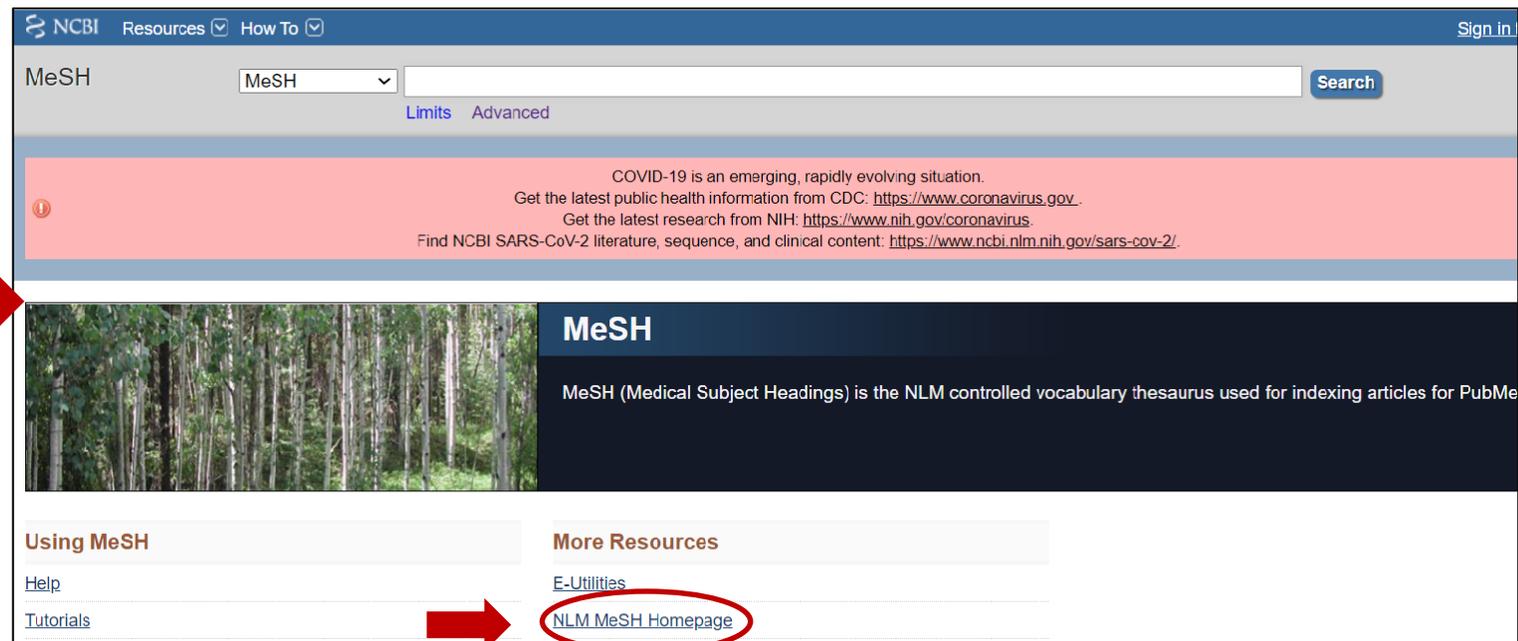
- Bibliographic databases deal with language variation by means of controlled vocabularies where each concept points to one specific term, regardless of the word choice made by the authors: this gives consistency to the indexing of literature
- The Medical Subject Headings (MeSH) thesaurus is the controlled 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:

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

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

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

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>

SH Major Topic.

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

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

Tree Number(s): C14.280.647, C14.907.585
MeSH Unique ID: D017202

Entry Terms:

- Ischemia, Myocardial
- Ischemias, Myocardial
- Myocardial Ischemias
- Ischemic Heart Disease
- Heart Disease, Ischemic
- Disease, Ischemic Heart
- Diseases, Ischemic Heart
- Heart Diseases, Ischemic
- Ischemic Heart Diseases

Previous Indexing:

- [Coronary Disease \(1966-1992\)](#)

See Also:

- [Myocardial Infarction](#)
- [Myocardial Revascularization](#)
- [Myocardial Reperfusion](#)
- [Myocardial Stunning](#)
- [Ischemic Preconditioning, Myocardial](#)

[All MeSH Categories](#)

[Diseases Category](#)

[Cardiovascular Diseases](#)

[Heart Diseases](#)

Myocardial Ischemia

[Acute Coronary Syndrome](#)

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:

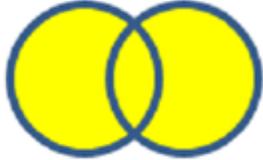
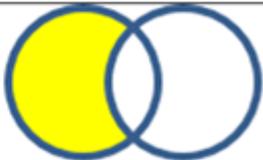
- **Restrict to MeSH Major Topic** (retrieves records having the selected term as a main concept)
- **Do not include MeSH terms found below this term in the MeSH hierarchy** (inhibits explosion, that is the retrieval of records indexed with narrower headings)
- **Subheadings selection** (qualifiers that 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	 <p>Both terms are included in each record</p>
OR	Binge-eating disorder OR bulimia nervosa	 <p>At least one of the terms is included in each record</p>
NOT	Psychotropic drugs NOT antidepressive agents	 <p>Records including the term after NOT are excluded</p>

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 excluded

Searching with boolean operators, example

Correlation between bronchitis and 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

Smoking

Willful or deliberate act of inhaling and exhaling SMOKE from burning substances or agents held by hand.

PubMed search builder options

[Subheadings:](#)

<input type="checkbox"/> adverse effects	<input type="checkbox"/> ethnology	<input type="checkbox"/> pharmacology
<input type="checkbox"/> analysis	<input type="checkbox"/> etiology	<input type="checkbox"/> physiology
<input type="checkbox"/> anatomy and histology	<input type="checkbox"/> genetics	<input type="checkbox"/> physiopathology
<input type="checkbox"/> blood	<input type="checkbox"/> history	<input type="checkbox"/> prevention and control
<input type="checkbox"/> cerebrospinal fluid	<input type="checkbox"/> immunology	<input type="checkbox"/> psychology
<input type="checkbox"/> complications	<input type="checkbox"/> instrumentation	<input type="checkbox"/> standards
<input type="checkbox"/> diagnosis	<input type="checkbox"/> legislation and jurisprudence	<input type="checkbox"/> statistics and numerical data
<input type="checkbox"/> drug effects	<input type="checkbox"/> metabolism	<input type="checkbox"/> therapeutic use
<input type="checkbox"/> drug therapy	<input type="checkbox"/> methods	<input type="checkbox"/> therapy
<input type="checkbox"/> economics	<input type="checkbox"/> mortality	<input type="checkbox"/> toxicity
<input type="checkbox"/> enzymology	<input type="checkbox"/> organization and administration	<input type="checkbox"/> trends
<input type="checkbox"/> epidemiology	<input type="checkbox"/> pathology	<input type="checkbox"/> urine
<input type="checkbox"/> ethics		

Restrict to MeSH Major Topic.

Do not include MeSH terms found below this term in the MeSH hierarchy.

PubMed Search Builder

("Bronchitis"[Mesh]) AND "Smoking"
[Mesh]

Add to search builder AND ▾

Search PubMed

YouTube T

Related information

PubMed

PubMed - Major Topic

Clinical Queries

NLM MeSH Browser

dbGaP Links

Recent Activity

[Turn Off](#)

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

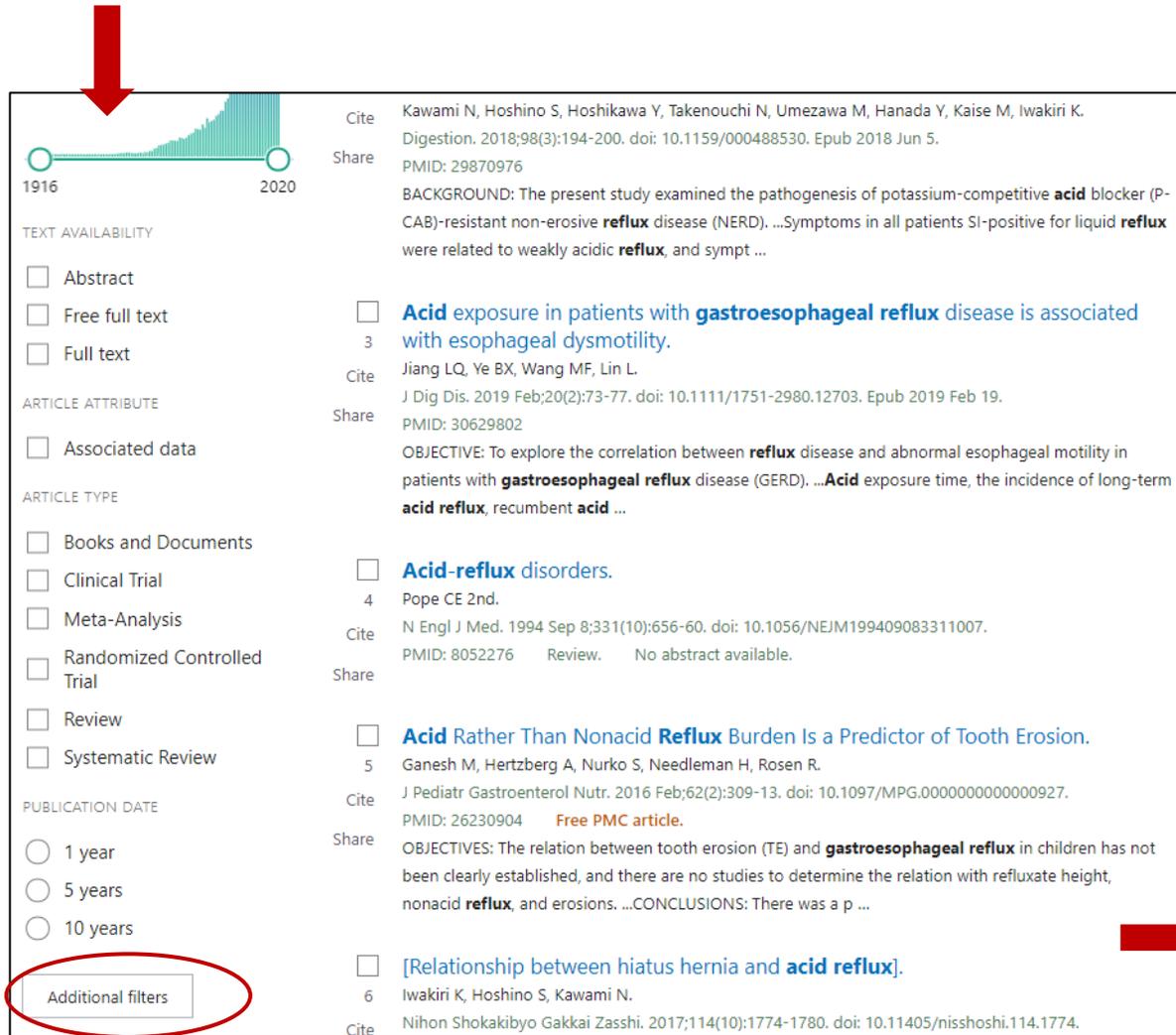
- Nesting of terms is useful when a concept can be expressed in several ways, especially if an appropriate Mesh term is missing or not applicable, like searching among non-indexed records.
- Round brackets enclose related terms, like synonyms or terms to be considered as a whole
- Nesting terms tells 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 symptoms and treatment of a disease (symptoms OR treatment) AND schizophrenia

Filters- 1



1916 2020

TEXT AVAILABILITY

- Abstract
- Free full text
- Full text

ARTICLE ATTRIBUTE

- Associated data

ARTICLE TYPE

- Books and Documents
- Clinical Trial
- Meta-Analysis
- Randomized Controlled Trial
- Review
- Systematic Review

PUBLICATION DATE

- 1 year
- 5 years
- 10 years

Additional filters

Cite Kawami N, Hoshino S, Hoshikawa Y, Takenouchi N, Umezawa M, Hanada Y, Kaise M, Iwakiri K. Digestion. 2018;98(3):194-200. doi: 10.1159/000488530. Epub 2018 Jun 5. PMID: 29870976

Share BACKGROUND: The present study examined the pathogenesis of potassium-competitive **acid** blocker (P-CAB)-resistant non-erosive **reflux** disease (NERD). ...Symptoms in all patients SI-positive for liquid **reflux** were related to weakly acidic **reflux**, and sympt ...

Acid exposure in patients with gastroesophageal reflux disease is associated with esophageal dysmotility.
3

Cite Jiang LQ, Ye BX, Wang MF, Lin L. J Dig Dis. 2019 Feb;20(2):73-77. doi: 10.1111/1751-2980.12703. Epub 2019 Feb 19. PMID: 30629802

Share OBJECTIVE: To explore the correlation between **reflux** disease and abnormal esophageal motility in patients with **gastroesophageal reflux** disease (GERD). ...**Acid** exposure time, the incidence of long-term **acid reflux**, recumbent **acid** ...

Acid-reflux disorders.
4

Cite Pope CE 2nd. N Engl J Med. 1994 Sep 8;331(10):656-60. doi: 10.1056/NEJM199409083311007. PMID: 8052276 Review. No abstract available.

Share

Acid Rather Than Nonacid Reflux Burden Is a Predictor of Tooth Erosion.
5

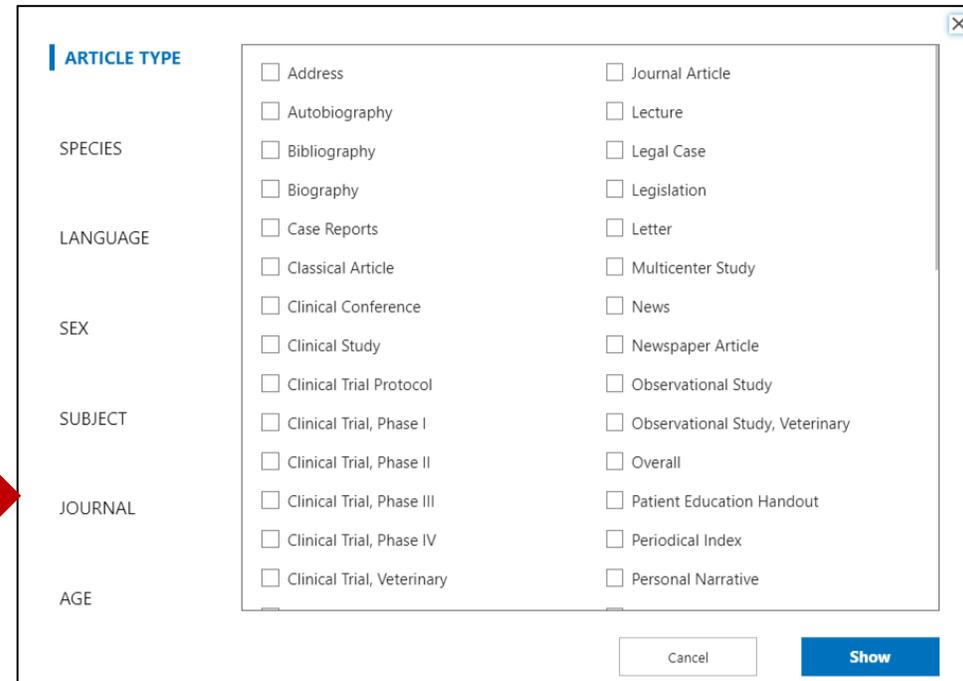
Cite Ganesh M, Hertzberg A, Nurko S, Needleman H, Rosen R. J Pediatr Gastroenterol Nutr. 2016 Feb;62(2):309-13. doi: 10.1097/MPG.0000000000000927. PMID: 26230904 **Free PMC article.**

Share OBJECTIVES: The relation between tooth erosion (TE) and **gastroesophageal reflux** in children has not been clearly established, and there are no studies to determine the relation with refluxate height, nonacid **reflux**, and erosions. ...CONCLUSIONS: There was a p ...

[Relationship between hiatus hernia and acid reflux].
6

Cite Iwakiri K, Hoshino S, Kawami N. Nihon Shokakibyō Gakkai Zasshi. 2017;114(10):1774-1780. doi: 10.11405/nisshoshi.114.1774.

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



ARTICLE TYPE

SPECIES

- Address
- Autobiography
- Bibliography
- Biography
- Case Reports
- Classical Article
- Clinical Conference
- Clinical Study
- Clinical Trial Protocol
- Clinical Trial, Phase I
- Clinical Trial, Phase II
- Clinical Trial, Phase III
- Clinical Trial, Phase IV
- Clinical Trial, Veterinary

LANGUAGE

SEX

SUBJECT

JOURNAL

AGE

- Journal Article
- Lecture
- Legal Case
- Legislation
- Letter
- Multicenter Study
- News
- Newspaper Article
- Observational Study
- Observational Study, Veterinary
- Overall
- Patient Education Handout
- Periodical Index
- Personal Narrative

Cancel Show

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 permanently set up in My NCBI filters

Using Covid-19 filter

million citations for biomedical
t content from PubMed Cent

Home page PubMed



Find

Advanced Search
Clinical Queries
Single Citation Matcher

PubMed Clinical Queries

Results of searches on this page are limited to [specific clinical queries](#)

chronic fatigue

COVID-19 Articles

Category:

Treatment
General
Mechanism
Transmission
Diagnosis
Treatment
Prevention
Case Report
Forecasting

5 of 79 results

Factors that affect the duration of wearing disposable per
protective equipment by healthcare professionals in Wuh
during treatment of COVID-19 patients: An epidemiologic

- 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

Clinical Study Categories

Category:

Scope:

5 of 6,371 results

[Impact of baseline body mass index on the efficacy and safety of tofacitinib in patients with psoriatic arthritis.](#)
Giles JT, et al. RMD Open. 2021. PMID: 33452181 [Free article.](#)

Scope:

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 Resources
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 Information Resources
Health Literacy	A PubMed Health Literacy search. View search strategy. See also links to other Health Literacy Resources
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](#)

<p>Bioethics</p> <p>This strategy was created by NLM and the Kennedy Institute of Ethics, Georgetown University. It can also be used in a search as bioethics [sb]. Example: euthanasia AND bioethics [sb]</p>
<p>Cancer</p> <p>This strategy uses terms from the Neoplasms (and related) branches of MeSH. It is provided by the National Cancer Institute to facilitate searching for subjects in all areas of cancer research. It can also be used in a search as cancer [sb]. Example: survivors AND cancer [sb]</p>
<p>Complementary Medicine</p> <p>This strategy was created using terms from the Alternative Medicine branch of MeSH. It is provided by the Center for Complementary and Integrative Health (NCCIH), NIH. It is provided to facilitate searching for subjects in the area of complementary medicine. This filter can also be used in a search as cam [sb]. Example: osteoarthritis AND cam [sb]</p>
<p>Developmental and Reproductive Toxicology (DART)</p> <p>This strategy was created to facilitate searching for subjects in the area of developmental and reproductive toxicology. It can also be used in a search as dart [sb]. Example: mercury AND dart [sb]</p>
<p>Dietary Supplements</p> <p>This strategy was developed jointly by NLM and the Office of Dietary Supplements. It is provided to facilitate searching for subjects in a broad spectrum of dietary supplement literature. This filter can also be used in a search as dietsuppl [sb]. Example: anemia AND dietsuppl [sb]</p>

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 formulated 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 on the first results analysis, 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

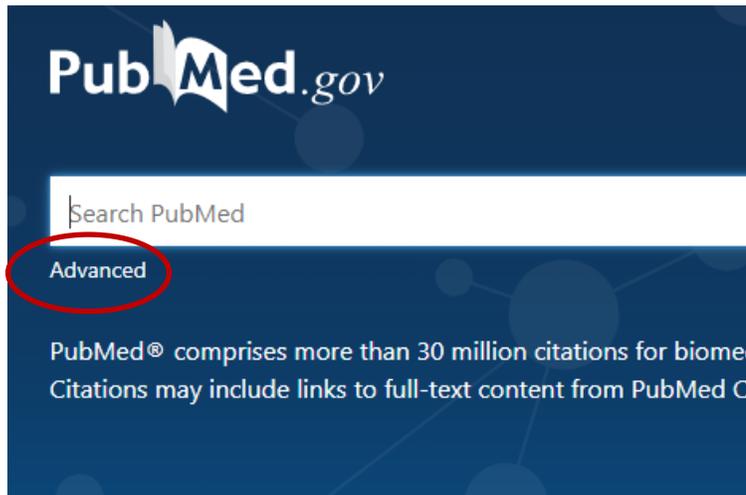
If a Mesh term is found, it will be searched as a Mesh heading (along with its narrower terms: explosion, in All fields as they are (as exact phrase in inverted commas), and as single terms combined with AND

- 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 **ADD**

Show Index

Query box

Search

History and Search Details

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 synonyms 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 sinonim-1 " OR "AAA sinonim-2 " OR "AAA sinonim-3 " ... etc.

AND

"BBB" OR "BBB sinonim -1 " OR "BBB sinonim -2" OR "BBB sinonim -3" ... etc.

Note: Most filters, being mesh headings, must be expressed with free text and synonyms, 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)



The screenshot shows a search interface with a header "Add terms to the query box". Below this is a search box containing the text "chronic fatigue" and a close button (X). To the left of the search box is a dropdown menu with "Title/Abstract" selected and circled in red. To the right of the search box is a blue "ADD" button with a downward arrow. Below the "ADD" button is a link "Show Index".

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

The screenshot shows the PubMed.gov interface. On the left, the 'Advanced' link is circled in red. On the right, the 'History and Search Details' panel is open, displaying a table of search history. A dropdown menu is open for search #13, showing options to combine searches with AND, OR, or NOT, or to delete or create an alert.

Search	Actions	Details	Query	Results	Time
#14	...	>	Search: (("Bronchitis"[Mesh]) AND "Air Pollution"[Mesh]) NOT ("Aged"[Mesh])	605	09:51:10
#13	...		'Bronchitis"[Mesh]) AND "Air Pollution"[Mesh]	738	09:50:54
#10	...		Aged"[Mesh] Sort by: Most Recent	3,178,764	09:46:28

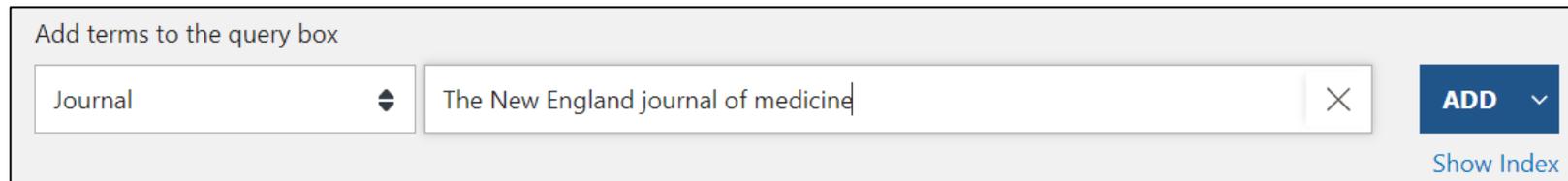
Showing 1 to 3 of 3

- 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

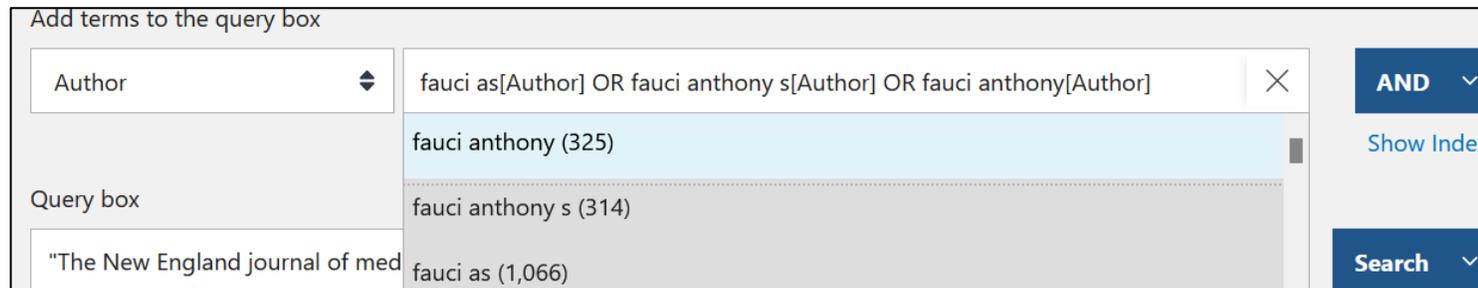
- Select field **Journal** -> Write/select journal title-> -> Click **ADD**



Add terms to the query box

Journal

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



Add terms to the query box

Author

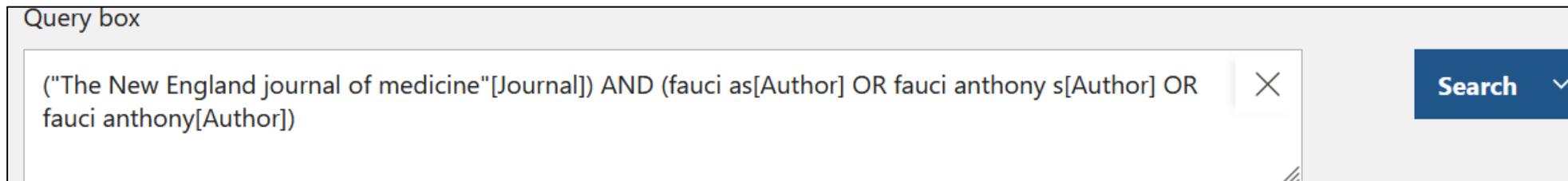
Query box

fauci anthony (325)

fauci anthony s (314)

fauci as (1,066)

Final search strategy



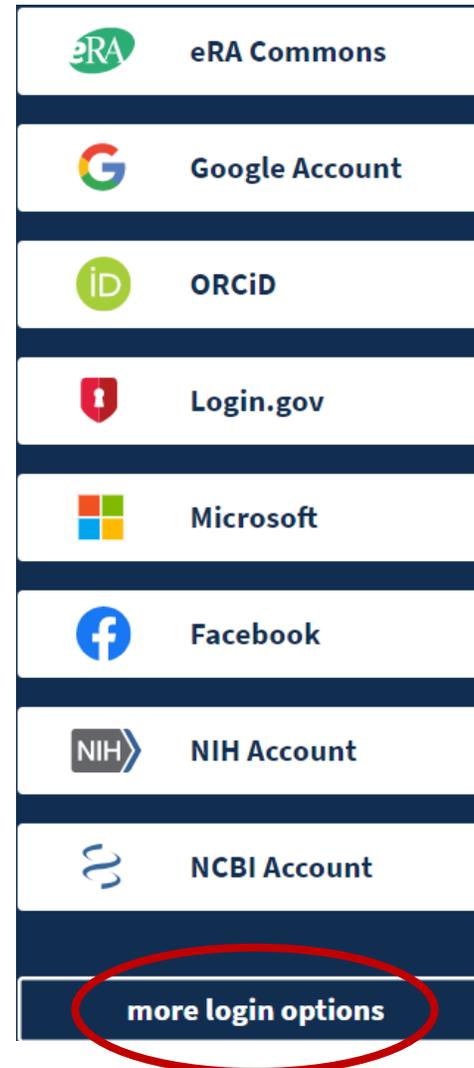
Query box

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

The screenshot displays the MyNCBI user interface. At the top, there is a navigation bar with 'NCBI Resources', 'How To', and user options like 'lisadainese', 'My NCBI', and 'Sign Out'. The main content area is divided into several panels:

- Search NCBI databases:** A search box with a dropdown menu set to 'PubMed' and a 'Search' button. A hint below states: 'Hint: clicking the "Search" button without any terms listed in the search box will transport you to that database's homepage.'
- My Bibliography:** A section indicating 'Your bibliography contains 4 items' and 'Your bibliography is private', with a 'Manage My Bibliography »' link.
- Recent Activity:** A table showing search history with columns for Time, Database, Type, and Term.

Time	Database	Type	Term
Yesterday 03:34 AM	Books	record	PMC Help
Yesterday 03:27 AM	NLM Catalog	search	nlmcatalog.pubmed[subset]
13-Jan-2021	Books	record	My NCBI Help - My NCBI Help
12-Jan-2021	MeSH	record	Pharmacologic Actions
12-Jan-2021	PMC	record	Author Name Disambiguation for PubM
- Saved Searches:** A table listing saved search queries with columns for Search Name, What's New, and Last Searched.

Search Name	What's New	Last Searched
Simulation training covid-19	45	last year
Simulation training covid	43	last year
cocaine heart failure	1	last year
endorphins physical activity	0	last year
(("Circulation"[Journal])_OR "stroke"[Journal])...	1	last year
System Rev unipd	132	last year
Infarto miocardio stress	3	last year
Diabete att fisica glucosio	141	last year
hepatocarcinogenesis diet	14	last year
Melatonina sleep disorders	0	last year
- Collections:** A section stating 'All bibliographies and Other citations are now in My Bibliography' and a table for collections.

Collection Name	Items	Settings/Sharing	Type
Favorites	5	Private	Standard

Navigation links at the top right include 'Customize this page', 'NCBI Site Preferences', 'Video Overview', and 'Help'. The 'NCBI Site Preferences' link is circled in red. In the 'Saved Searches' panel, the 'Manage Saved Searches »' link is also circled in red.

NCBI site preferences

-> Highlighting -> select color to highlight searched terms

Recent activity keeps track of 6 months activity

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

A brief tutorial :

<https://www.nlm.nih.gov/oet/ed/pubmed/quick tours/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 - Università degli studi di Padova



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