# THE NEW PubMed – IMPROVEMENTS OF THE MOST WIDELY USED DATABASE ON BIOMEDICAL INFORMATION

## A NOVA PubMed – DESENVOLVIMENTOS DA BASE DE DADOS MAIS UTILIZADA PARA PESQUISA DE INFORMAÇÃO BIOMÉDICA

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Launched in 1996 by the U. S. National Library of Medicine (NLM), PubMed allowed free access to the collection of indexed publications on MEDLINE. Currently it includes more than 30 million citations from biomedical literature and provides several complementary resources.[1]

Available since May 18, 2020, the new PubMed presents a renewed design (Fig. 1) and an upgrade in terms of functionalities, thus ensuring greater navigation efficiency on mobile devices. Developments are set to continue and the two versions (new and legacy) will coexist until the new system stabilizes, with the implementation of new features and the integration of the Thesaurus MeSH (Medical Subject Headings), the NLM Catalogue and Clinical Queries, Single Citation Matcher and Batch Citation Matcher tools. Although the NLM aimed to provide PubMed users with a modern interface, easier navigation and better search results based on machine learning algorithms, the reactions to the sweeping redesign have not been consensual. Many PubMed users see no benefit in the updates and are highly resistant to the new version.[2] The legacy version is still online
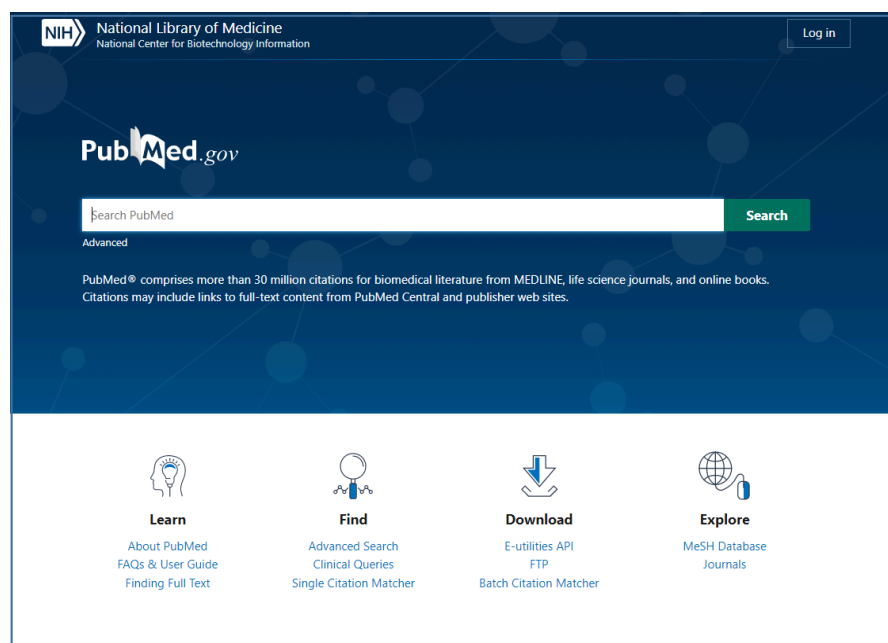


FIGURE 1 – **New PubMed home page.**

(https://pmlegacy.ncbi.nlm.nih.gov/), but it will soon be disabled, so we really encourage users to explore the new version (https://pubmed.ncbi.nlm.nih.gov/), even if that means having to relearn how to make searches to benefit from all the new improvements.

In order to describe the new platform's potential, explain how its new algorithms work and highlight some of its constrains, a brief summary of the main changes is presented.[3]

## BASIC SEARCH AND RESULTS DISPLAY

Starting from a basic search, the first difference is the number of results obtained and the way they are presented. The new PubMed is more comprehensive in retrieving results, with significant changes in the syntax and translation of search expressions. The automatic mapping of terms reinforced the sensitivity regarding synonymy (female/male, plural/singular, etc.); English (British/American) language differences and the application of truncation is no longer limited to the first 600 variables of the term. Now, 10 results are presented per page and the presentation criteria is "Best Match", based on an algorithm for analysing the frequency of terms searched in each quote. If you prefer to see the most recent results on the top of the page, as it used to appear before, just select the "most recent" option in the "Display Options" button.

Citations continue to appear in the "Summary" format. In addition to the reference, it also includes the initial part of the abstract, with the searched terms highlighted. "Cite" and "Share" options allows you to copy, download or export the citation formatted according to AMA, MLA, APA or NLM. The sharing of citations on social networks, or a copy of the permanent URL of the reference is now possible through the "Share" option. "Save" allows you to save selected references in Summary, Ris, Abstract or CSV format. "Send" is only for sending references to Clipboard, My Bibliography,

Collections or Citation Manager. It is also possible to send your list of results to email, on Summary or Abstract format.

Reading abstracts has become more friendly. Through the "Next Result" or "Prev Result" options, it is possible to go to the next or previous record, without returning to the initial general list of results. In addition to the full text links, an index is available in the right sidebar to get access to specific information: title & authors, figures, similar articles, cited by, publication type, MeSH terms, and links other options and more results.

## ADVANCED SEARCH

In addition to the mentioned changes in the syntax and translation of the search expressions, advanced search is where some of the most interesting developments are found. The principle of building "Queries" remains the same as in the legacy version of PubMed. The "Query Box" is now below the "Search Box", which seems more functional, providing greater visibility to the details of the search strategy as we are building it. This way, it becomes easier to evaluate the search strategy, avoid and correct errors.

After entering terms in the search box, an auxiliary index – "Show Index" is available to identify variables of the term and find out how many records there are for each variable.

Automatic filters are available in the left sidebar of the general results list. Critical sense in its application is recommended. As automatic filters are based on MeSH indexing, limiting your search strategy with these filters, can exclude articles not yet indexed (PubMed in Process or PubMed as Supplied by Publisher). Depending on the context, to balance precision and recall, manual filters should be used.

The temporal setting, in the automatic filter "Publication Date", now includes only three pre-defined filters (1 year; 5 years or 10 years). A

specific time range can be defined at the advanced search query box, through the "Date – Publication" option.

## SEARCH WITH MeSH TERMS

At this point, search with MeSH terms is only possible at the advanced search query box, through three different options: MeSH Major Topic, MeSH Subheadings and MeSH Terms. Until new developments, MeSH Database is still available through the legacy version (https://www.ncbi.nlm.nih.gov/mesh/). After testing, it seems that the search in both versions, returns the same number of results.

## MyNCBI

Personal profiles created on the legacy version on MyNCBI - a tool that retains user information and database preferences to provide customized services (save searches, select display formats, filtering options, and set up email alerts), remains available in the new PubMed.

Despite these new features, "some issues" are being identified. Recently, considering the changes made to the search algorithm, which aims to improve the location of scientific articles, García-Puente et al.,[4] detected some changes that make the reproducibility of bibliographic searches difficult. In order to safeguard the reproducibility and replicability of the searches carried out for systematic reviews, narratives and meta-analyses, they suggest accompanying these strategies with a file in a format compatible with reference managers, to facilitate comparison and verification of the strategy to be replicated in a future.

After some initial resistance, it is important to explore all the new functionalities and improve search skills to ensure better results. As the new PubMed is an ongoing project, more developments are expected. New changes can be made and previous decisions can be reversed, to take into account user feedback. On the right side of each window you can always find a green button to automatically send your feedback. Just use it!

## REFERENCES

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