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# Trip Database: Turning Research into Practice for Evidence-Based Care

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**Gregg A. Stevens, Lori Fitterling, and F. Victoria Kelly**

**ABSTRACT.** Trip Database is a freely available search engine based in the United Kingdom. Trip directs users to journal articles, practice guidelines, and other research to support evidence-based medical practice. This column includes sample searches in both the free version and in the subscription Pro version.

**KEYWORDS.** evidence-based medicine, Internet, online databases, review, Trip

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## *INTRODUCTION*

Originally known as *Turning Research into Practice*, Trip was initially created in 1997, as a Microsoft Excel spreadsheet for evidence-based content from the UK National Health Service. Searched globally over 100 million times to date, the Trip database predominantly serves primary care and specialty physicians (70% of its user population), but other users include clinical care team members, information specialists, patients, and caregivers. Most of Trip's users come from English-speaking countries such as the United States, the United Kingdom, Canada, and Australia; however, Trip is expanding its base by providing searching translation in seven languages: English, French, Spanish, German, Czech, Hungarian, and Swedish. Trip's intention is to match Google in ease of usability, creating user-friendly, fast search ability that permits a broad accessibility necessary to support global audiences.[1]

Trip's search filtering system also allows searches by publisher. Trip developed a publisher classification system, which groups publishers by the primary type of research material they provide, such as key primary research or systemic reviews. The filtering system allows users to refine searches by publisher, by dates, and by a controlled trials search, which has recently been enhanced to provide controlled trial hits with 97% accuracy.[2]

Trip recently fine-tuned its search engine to supply clinical need-based answers by linking search terms to provide both disease and intervention results.[3] Thus, the search engine itself will gauge the clinical questions behind the search term(s), reducing search effort and time. The SmartSearch feature gleans and suggests results that are relevant to articles a user has selected in a primary search.[4] Trip's PICO (Population, Intervention, Comparison, and Outcome) search approach builds on the components of the typical two-fold clinical inquiry: an investigation of both problem and resolution.

Additional new improvements to the Trip search experience include visual presentation changes, user interactivity, and controlled trial bias estimates.[5] Search suggestions are now listed mid-page to catch the user's attention, broken links can be reported with ease by clicking on the link, and RobotReviewer will assess the bias of a clinical trial with human-like precision.[2]

Trip offers free accounts to users. Users who register with Trip can find previously viewed documents and searches and can set documents as favorites. They also receive monthly updates of content according to interests and specialties.[1] Full-text document access for subscription-based resources may be available through the user's institution. Many of the resources are available through open access, such as the articles in PubMed Central® and the practice guidelines available through Guideline.gov. Documents may be exported into email and into reference management software.[1]

Trip's content updates approximately once every month, except for PubMed content, which is updated biweekly in Trip. Trip also provides informal updates of their research, news, and search engine processes in a blog called Liberating the Literature, available at <http://blog.tripdatabase.com>. Topics currently being discussed in this blog are Dementia

Networks, Search Patterns in Trip, and Marketing Trip. Trip archives older blog topics and provides links to these by date and topic.

Trip offers four types of search options: simple search, PICO, advanced search, and recent searches. The advanced and recent searches are available only with Trip Pro, as is the ability to search images and videos.

*SAMPLE BASIC SEARCH*

Developers of the Trip database have made the basic search features intuitive for users who are accustomed to searching via a single search box. By using a Google-like search box, users know to begin by selecting terms that best describe their topic. Boolean operators, quotation marks, truncation, and wildcards can be used to formulate a simple search strategy using keywords.

Trip is a meta-search engine that crawls through documents looking for text words. It utilizes a synonyms function that identifies synonyms of search terms, and, while this is not a controlled vocabulary with medical subject headings, it is a function that allows variance in the usage of medical terminology and abbreviations. When search terms are entered in the simple search box, possible synonyms are suggested. Combining search terms using Boolean operators (AND, OR, NOT) will narrow searches, and adding quotation marks or parentheses will allow a phrase to be searched in the simple search option (e.g., "pulmonary hypertension"). The asterisk * is used to truncate words. To demonstrate a basic search, a sample search of hyperkalemia AND Veltassa was conducted (see Figure 1).

Once results are displayed, searches can be refined through the filtering feature located on the right side of the results page titled "Evidence type." Each publisher is categorized by the

content of their publications, and results are filtered based on the publisher's content classification (e.g., all Cochrane results would fall in the systematic reviews filter). Each evidence type is also color coded, so that the hierarchy of publications is seen in the results list. By looking down the results list, colors easily identify the level of evidence of the document (e.g., primary evidence is red, secondary evidence is green, clinical trials are orange, etc.), giving users visual clues to complement their search experience. By choosing a specific evidence type or color, results can be further narrowed. Searches can also be filtered by publication date or by articles previously viewed in the further refinements at the bottom of the refine by box.

## *PICO SEARCH*

PICO is a mnemonic that describes the four elements contained in a good clinical question. By choosing the PICO search option in TRIP, a user can focus their search based on a clinical question relative to Patient, Intervention, Comparison, and Outcome. The more information that is provided in the initial search, the better the results for the PICO search option, but all elements do not have to be included. In a sample PICO search (see Figure 2), heart failure was entered in the Population box, candesartan was entered in the Intervention box, losartan was entered in the Comparison box, and reduced mortality was entered in the Outcome box. This search poses the clinical question, "In patients with heart failure how does candesartan compare with losartan in reducing mortality?" Results retrieve 54 with the first from a Cochrane Review when sorted by quality:

Grosso AM, Bodalia PN, Macallister RJ, Hingorani AD, Moon JC, Scott MA.

Comparative clinical- and cost-effectiveness of candesartan and losartan in the

management of hypertension and heart failure: a systematic review, meta- and

cost-utility analysis. Int J Clin Pract. 2011 Mar;65(3):253-63.

This unique search emphasizes the clinical aspects of TRIP and its evidence based practice

utility, which is distinctive from other medical databases.

## *ADDITIONAL FEATURES IN TRIP PRO*

Trip offers additional features and content in its subscription version, Trip Pro. One of the most

significant differences, according to the database's upgrade page, is that there is additional

content available in the Pro version. The Pro details page states that there are more than 100,000

additional systematic reviews and millions more free-text articles available than in the free

edition. Sample searches conducted in both the regular and Pro versions produced more results in

Pro. For example, a search for "diabetic foot ulcer" retrieved 2,667 results in the standard version

but 2,765 in the Pro version. A search for "schizophrenia diagnosis" in the regular version led to

9,957 results, but in Pro there were 10,390 results. As previously mentioned, advanced searching

is available only in the Pro version. The advanced search feature allows searching using a phrase

and the ability to exclude words or phrases. It also allows the user to choose where in the article

they would like to search (i.e., title only or anywhere in the document).

To the right of the Evidence tab on a search page are two additional tabs. These tabs are

for advanced features only available in the Pro version. The first of the useful additional features

in the Pro version is an image search. The images retrieved in a search may be photographs,

illustrations, or radiographs, depending on the topic. A sample search of "rheumatoid arthritis"

supplied dozens of photographs of arthritic hands, color anatomical illustrations of arthritic joints, and x-ray images of afflicted joints (see Figure 3). On the top right, above the images, there is an option to check for limiting results to images that the user can freely use without copyright restrictions. Most of these images appear to come from wikis and other open access resources, while the majority of the copyrighted images seem to be from hospital and medical school websites.

The second additional feature in the Pro version is a video search. Using "rheumatoid arthritis" again as a sample search topic, 20 videos were retrieved (see Figure 4). The results list shows the video title, source of video, and the year of production. All the videos highlighted are freely available in YouTube. Many of the videos retrieved were from well-respected health organizations such as the Mayo Clinic and the Wellcome Trust. Others are associated with journals such as *BMJ* and *Rheumatology News*. Because many of the videos are intended for patients, this could be a useful feature for librarians and health professionals needing consumer health resources for patients.

Besides the image and video features, there are a number of other useful features for users of Trip Pro. In addition to the standard filter for evidence type, Pro users may also filter results by clinical area. There are 30 medical and dental clinical specialties to choose from; however, there are currently no filters for nursing or other health professions. Besides the basic search box, the Pro version features an advanced search interface that allows for more controlled searching. Users may export their article search results into CSV or RIS files for integration into bibliographic management software, as well as send results via email.

The Pro version is available either as a personal subscription at $40 per year or an institutional subscription. Institutional pricing varies based on size and type of organization, with rates starting at $215 per year.[6]

### *CONCLUSION*

Trip offers access to quality health care information with an interface that will appeal to many users who might not have the time or searching experience to conduct a full literature search in PubMed or another database. Its focus on health care information sets it apart from Google Scholar and other search engines, which have wider subject coverage. It will be of greatest interest to its intended audience: health care professionals in a clinical setting who need point-of-care information.

Despite offering a number of filters, it is not an ideal tool for librarians and other researchers conducting comprehensive literature reviews because there is no controlled vocabulary and it is difficult to search with precision. However, the search algorithm may provide citations to articles and reports missed in systematic database searching, so it could be of some value after primary searching has concluded.

### *FOR MORE INFORMATION*

For more information on Trip, please direct queries to:

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Trip can also be contacted through Facebook, Twitter, and YouTube.

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