

Strategies for Searching the Literature Using PubMed



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CE Credits: 3 hours

Intended Audience: Dentists, Dental Hygienists, Dental Assistants, Dental Students, Dental Hygiene Students, Dental Assistant Students

Date Course Online: 04/13/2009

Last Revision Date: 07/02/2021

Course Expiration Date: 06/30/2024

Cost: Free

Method: Self-instructional

AGD Subject Code(s): 130, 770

Online Course: www.dentalcare.com/en-us/professional-education/ce-courses/ce340

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Conflict of Interest Disclosure Statement

- Dr. Jane Forrest has done consulting work for P&G. She is a member of the P&G Oral Care Global Dental Hygiene Advisory Board.
- Ms. Miller reports no conflicts of interest associated with this course.

Introduction

This continuing education course is a follow up to the course, [Evidence-Based Decision Making: Introduction and Formulating Good Clinical Questions](#).¹ The primary learning objectives for this course are to increase your skills in conducting an efficient computerized search using PubMed to answer a specific clinical question, the second step of the Evidence-based process.

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Overview

Finding relevant evidence to answer clinical questions requires conducting a focused search of the peer-reviewed professional literature. To assist professionals in keeping up with the literature and in making it possible to quickly find needed information without leaving your location, online access to MEDLINE, the premier scientific database provided by the National Library of Medicine, is available at no cost through PubMed. The purpose of this course is to outline the steps involved in conducting a PubMed search using both the traditional comprehensive PubMed search mechanism, including the MeSH database, and the PubMed Clinical Queries feature to answer clinical questions. Case scenarios will demonstrate the application of the skills involved. To gain hands-on experience learning the skills, open a second window in your browser and complete each step as you read about it in the course.

Learning Objectives

Upon completion of this course, the dental professional should be able to:

- Identify key search terms using the components of a PICO question (Patient/

Population Problem, Intervention, Comparison and Outcome).

- Navigate PubMed's home page.
- Apply PubMed's Filters and Advance Search Features in conducting an efficient search.
- Search the PubMed MeSH Database to find the correct indexing terms.
- Describe how to use Boolean operators (AND, OR and NOT) to combine search terms.
- Discuss how using the PubMed 'Filters' feature assists in finding the highest levels of evidence.
- Explain how to combine previous search queries using the Advanced Search History feature.
- Effectively use PubMed to find evidence to answer a question using the PubMed features including: MeSH, Boolean Operators, Filters, and the Advance Search History.
- Conduct a PubMed search using the Clinical Queries feature.
- Compare the traditional comprehensive PubMed search with using the PubMed Clinical Queries feature.

Structuring a PubMed Comprehensive Search Using a PICO Question

The first course, [*Evidence-Based Decision Making: Introduction and Formulating Good Clinical Questions*](#),¹ demonstrated how to construct a PICO Question from a case scenario. The following is a brief review of the case, the PICO question and key terms that will be used to illustrate a comprehensive PubMed search.

Case Scenario

Your new patient, Mr. Nathan Baker, is a 20-year old college student-athlete who has been swimming competitively since he was 12-years-old. His chief complaint is about the smooth, yellow areas near his gum line that he recently noticed. He wants to know what might be causing this and if there is anything he can do to fix and/or prevent it from getting worse. When reviewing his health history and behaviors, you learn that Nathan is a vegetarian, frequently snacking throughout the day on healthy fruits and vegetables. He also consumes sports drinks and an occasional energy drink with his hectic student/athlete schedule.

Nathan currently uses a manual toothbrush right after every meal, flosses nightly, and uses whatever fluoride toothpaste is on sale when he goes to buy one. Since you suspect his chief complaint is due to erosion, you perform the Basic Erosive Wear Examination (BEWE),² and calculate his BEWE score to be 10, indicating he is at medium risk for erosive wear.

From Nathan's assessment, we suspect the erosion is due to multiple risk factors including his diet and dietary habits, oral health regimen, and his competitive swimming. After discussing each of Nathan's risk factors, he realizes that some of his habits are contributing to his oral health problem. He had always thought being a vegetarian was healthy and that it was good to brush right after meals. He did not know that his diet was acidic and eating too frequently could contribute to erosion.^{3,4} Nor did he realize that he should wait 1-2 hours before brushing his teeth after an acid exposure,⁵ or that as a competitive swimmer, if he is training in water with a pH lower than the optimal (7.2-8.0) he may be subject to further erosion.⁶

You both agree on changes that he can make with his eating and oral care habits but realize there are some things that aren't going to change – like the fact he is a competitive swimmer and plans to remain a vegetarian. He then asks you about the toothpaste he should be using. He asks you about Sensodyne Pronamel® (a sodium fluoride toothpaste with potassium nitrate), since he recently heard a TV commercial stating that it helps with erosion. You typically recommend a stannous fluoride toothpaste, like Crest Pro-Health, but are not sure which one will be more effective in preventing the initiation and further progression of dental erosion.

To find the answer, you structure Nathan's question following the PICO formula: "For a patient with erosive tooth wear (P), will Sensodyne Pronamel® (a sodium fluoride toothpaste with potassium nitrate) (I), as compared to Crest Pro Health (a stannous fluoride toothpaste) (C), be more effective in preventing the initiation of further erosive tooth wear (O)?"

Key search terms are derived from the PICO components comprising the PICO question. In this case, they include the Intervention (I: sodium fluoride toothpaste with potassium nitrate or Sensodyne Pronamel), and the Comparison (C: stannous fluoride toothpaste or Crest Pro-Health toothpaste). In this specific example, including the Problem (P), erosive tooth wear, as part of the search will be important since the two different fluoride toothpastes may be compared for other reasons, e.g., occlusal or root caries, or dentinal hypersensitivity. Without including the P, which narrows the search to the specific problem, the search would include different answers/outcomes other than their comparison for tooth erosion. However, in general, the two main search terms are the I and C since you will want studies that compare the two to determine which is more effective. Next, identify any additional terms or phrases (synonyms) related to the already identified P, I, C, and O (See Table 1 – Mr. Baker's PICO Worksheet). By generating these words, alternative key terms are identified that facilitate finding evidence to answer the question.

Understanding PubMed Key Features

After structuring a specific clinical question, the next step in the evidence-based process is finding the evidence through conducting an online search of the scientific literature. As familiar as many dental professions have become in searching the Internet, most have not had a specific course on searching biomedical databases, such as PubMed. These require a basic understanding of the PubMed features, including the MeSH (Medical Subject Headings) database and Clinical Queries. All features can be used with either a traditional PubMed Comprehensive search, which begins on the homepage, or a Clinical Queries search (listed under FIND on the homepage) and are illustrated throughout this course. The one exception is in order to use the Advanced search and History features with Clinical Queries, you must click on the "See all" feature on the Clinical Queries page.

PubMed Home Page

Understanding how PubMed is structured begins

Table 1. Completed PICO Worksheet for Mr. Baker's Case.¹

| PICO Worksheet for Mr. Baker's Case | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------|
| Define your PICO Components (OUTCOME MUST MATCH THE PROBLEM). | | | |
| <i>Your question should be used to help establish your search strategy</i> | | | |
| 1. Problem: | <u>erosive tooth wear</u> | | |
| 2. Intervention: | <u>sodium fluoride + potassium nitrate toothpaste (Sensodyne Pronamel®)</u> | | |
| 3. Comparison: | <u>stannous fluoride toothpaste (Crest Pro-Health)</u> | | |
| 4. Outcome: | <u>more effective in preventing erosive tooth wear</u> | | |
| 5. Write out your question using the formula. (USE PICO COMPONENTS). | | | |
| For a patient with erosive tooth wear, will sodium fluoride + potassium nitrate toothpaste (Sensodyne Pronamel®), as compared to stannous fluoride toothpaste (Crest Pro-Health), be more effective in preventing erosive tooth wear? | | | |
| 6. Identify the Type of question. Circle one: | | | |
| <input checked="" type="checkbox"/> Therapy/Prevention | <input type="checkbox"/> Diagnosis | <input type="checkbox"/> Etiology/Causation/Harm, | <input type="checkbox"/> Prognosis |
| 7. Identify the type of study to include in your search. | | | |
| <input checked="" type="checkbox"/> Meta-Analysis | <input checked="" type="checkbox"/> Systematic Review | <input checked="" type="checkbox"/> Randomized Controlled Trial | |
| <input checked="" type="checkbox"/> Clinical Trial Cohort Study | <input checked="" type="checkbox"/> Practice Guidelines | <input type="checkbox"/> Case series or Case Report | |
| <input type="checkbox"/> Cohort Study | <input type="checkbox"/> Case Control Study | <input type="checkbox"/> Literature Review | |
| <input type="checkbox"/> Other: _____ | | | |
| 8. List the main topics and alternative terms from your PICO question that can be used for your search. | | | |
| <u>Erosive tooth wear, tooth erosion, tooth wear,</u> | | <u>tooth attrition, tooth abrasion</u> | |
| <u>Sodium fluoride + potassium nitrate toothpaste</u> | | <u>Stannous fluoride toothpaste/dentifrice</u> | |
| <u>Sensodyne Pronamel® dentifrice</u> | | <u>Crest Pro-Health toothpaste</u> | |
| 9. List inclusion criteria – e.g., gender, age, year of publication | | List irrelevant terms | |
| <u>Competitive swimmer</u> | | <u>Sodium fluoride (FL) toothpaste, FL mouthrinses</u> | |
| <u>Vegetarian</u> | | <u>Sensitivity or hypersensitivity, FL varnish, gels</u> | |
| _____ | | <u>Crest sodium FL or MFP toothpaste,</u> | |
| _____ | | <u>Sensodyne toothpaste, dental caries</u> | |
| 10. List where you plan to search, e.g., MEDLINE, PubMed, Cochrane Database, Trip, Other: | | | |
| <u>PubMed, Trip, ADA Center for EBD and Cochrane database</u> | | | |

with its Home Page (Figure 1). Three important areas that are most often used include:

1. A Search Box where terms are entered for conducting a traditional or comprehensive PubMed search.
2. Links to using the MeSH Database, Clinical Queries, and tutorials providing directions to using each of the features.
3. A link to the Advanced Search feature (below the Search Box).

PubMed is a free web based retrieval system developed by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine. It is part of

the larger NCBI system known as Entrez. PubMed includes over 31 million citations from MEDLINE, which comprises the largest part of PubMed. PubMed includes links to full text articles through PubMed Central and to publisher web sites that offer full-text articles, however, there may be a fee to access the full text. As technology has advanced, so have improvements to PubMed. The latest version of PubMed includes more available resources than the former version, referred to as Legacy. Some of the new resources include Quick Tours and a series on How PubMed Works. These upgrades were made in 2020 along with enhancements to the mobile version with 40% of users accessing PubMed from a mobile device.⁷

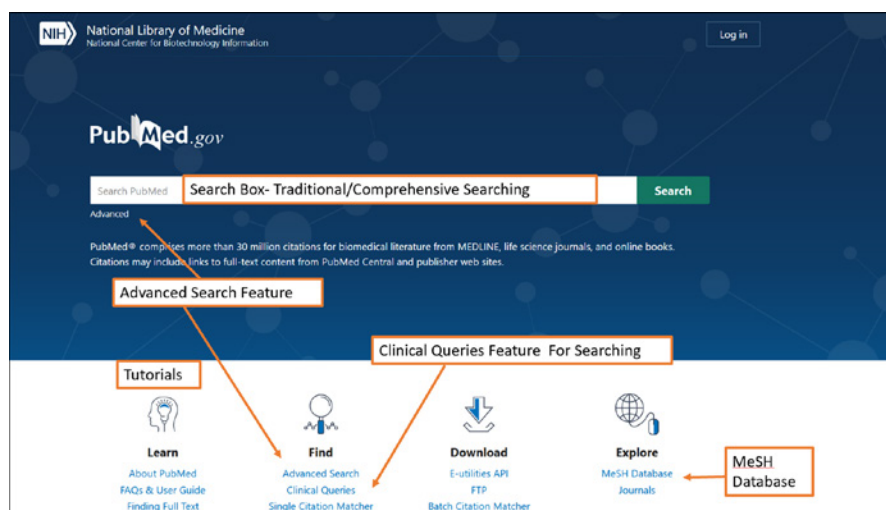


Figure 1. PubMed Home Page.

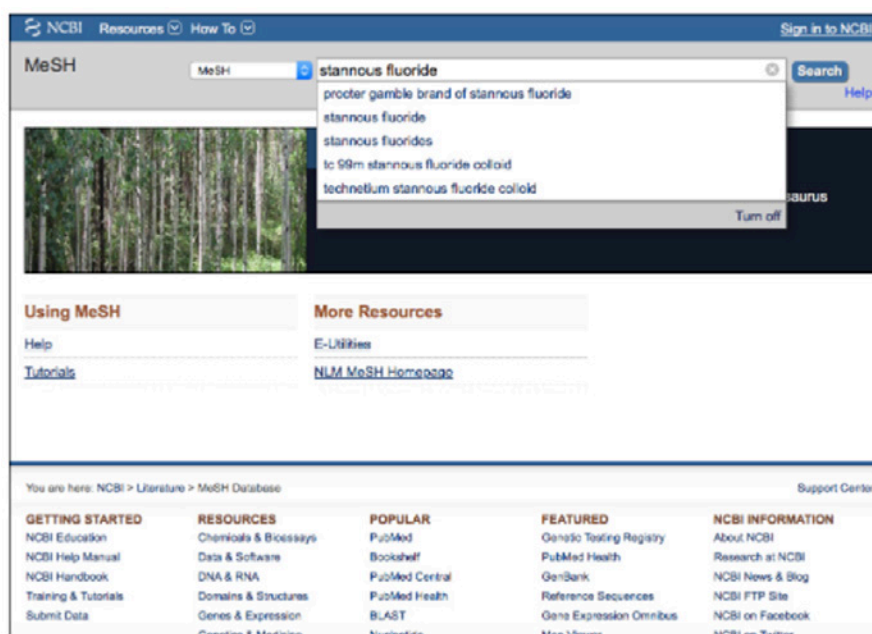


Figure 2. MeSH Database Search Page.

MeSH (Medical Subject Headings)

PubMed has an online user guide (<https://pubmed.ncbi.nlm.nih.gov/help/>) and YouTube tutorials that walk through the steps of a search and explain each PubMed feature and tool so users understand how to conduct a search and the language for how information on the database is indexed. For example, PubMed and MEDLINE use the MeSH (Medical Subject Headings), a controlled vocabulary thesaurus or indexing language, which allows there to be consistency in the key terms assigned to the articles indexed from journals. Each reference

is associated with a set of MeSH terms that describe the content of the item.

The MeSH Database can be accessed from the PubMed home page (Figure 1). By opening this browser, a word(s) can be entered in the search box. Although when typing in 'stannous fluoride' a pull-down list of other terms appears, do not mistake these for MeSH terms (Figure 2). They are just terms others have typed in.

Click on Search and the MeSH indexing term(s) that is/are used appear (Figure 3). Next, click

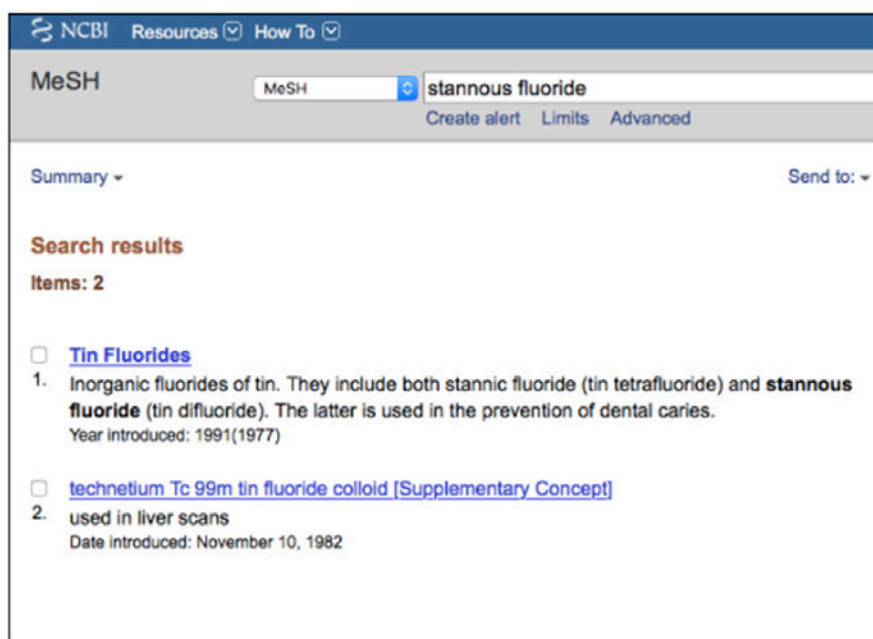


Figure 3. MeSH Database Search – Stannous Fluoride Results.

on Tin Fluorides since this appears to be the applicable term. Additional information is displayed related to subheadings, different entry terms, previous indexing and where the term is structured in the hierarchical “MeSH tree” (Figure 4). This is a helpful tool when an original search does not yield enough results. It will often provide additional terms related to a search, which may lead to more relevant information. For example, in searching for evidence on stannous fluoride, type in the term ‘stannous fluoride’ to determine if it is the correct MeSH term.

The results from using the MeSH Browser indicate that Tin Fluorides (vs. stannous fluoride) is the MeSH indexing term, however stannous fluoride is an entry term. If there were an inadequate number of citations then according to the MeSH Tree, the search would need to be broadened using the term Fluorides – one level up from Tin Fluorides.

When conducting the same search using the term Sodium Fluoride, the term Sodium Fluoride is identified as the MeSH term. Again, if there were an inadequate number of citations then according to the MeSH Tree, the search would need to be broadened using the term Fluorides – one level up from Sodium Fluoride.

Understanding PubMed Advanced Search Features

The Advanced search feature includes the Search Builder using Boolean Operators and the Search History. A link to a YouTube Tutorial is available on the upper right side of the Advanced search page (Figure 5) and explains the Advanced search feature.

Boolean Operators

Boolean logic refers to relationships among search terms. Boolean operators limit results of a search by letting the user combine search terms or concepts. The three Boolean operators are the words “**AND**,” “**OR**,” and “**NOT**” and although PubMed states they should be capitalized, you may also retrieve the same citations not capitalizing them.⁸ The **AND** operator is used to retrieve **results that contain the entered search terms** in a citation. A search for “stannous fluoride toothpaste **AND** sodium fluoride and potassium nitrate toothpaste” will retrieve only citations that reference **BOTH**. The **AND** is the default operator used in PubMed, so if a Boolean operator is not specified between two or more terms, PubMed will automatically use **AND** between terms.⁸

The **OR** operator looks for citations that have **at least one of the terms** and combines them

Entry Terms:

- Fluoride, Tin
- Fluorides, Tin
- Tin Fluoride
- Tin Difluoride
- Difluoride, Tin
- Difluorides, Tin
- Tin Difluorides
- Stannous Fluoride
- Fluoride, Stannous
- Fluorides, Stannous
- Stannous Fluorides
- Cav-X
- Floran
- Florans
- Tin Tetrafluoride
- Tetrafluoride, Tin
- Tetrafluorides, Tin
- Tin Tetrafluorides
- Stannic Fluoride
- Fluoride, Stannic
- Fluorides, Stannic
- Stannic Fluorides
- Gel-Kam
- Gel-Tin
- Omnii-Gel
- Omnii-Med
- Stanimax
- Stanimaxs
- Fluoristan
- Fluoristans

Previous Indexing:

- Fluorides (1966-1976)
- Fluorides, Topical (1966-1976)
- Tin (1966-1976)

Pharmacologic Action:

Cariostatic Agents

All MeSH Categories

Chemicals and Drugs Category

Inorganic Chemicals

Fluorine Compounds

Hydrofluoric Acid

Fluorides

Tin Fluorides

Figure 4. Stannous Fluoride / Tin Difluorides Entry Terms and MeSH Categories.

NIH National Library of Medicine
National Center for Biotechnology Information

Log in

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

Your history is currently empty! As you use PubMed your recent searches will appear here.

Figure 5. Top Portion of Advanced Search Builder Page.

together in one result. The **OR** operator is used to combine articles on similar topics or broaden your search. A search for “tooth erosion **OR** tooth wear” will retrieve citations that reference at least one of the terms. The **OR** Boolean operator is helpful to use when there are synonyms, e.g., tooth erosion OR erosive tooth wear. The **NOT** operator excludes the retrieval of terms from your search results. Typing “dental erosion **NOT** dental caries” excludes results about dental caries that also cause enamel damage. However, if articles refer to how enamel damage can occur, the **NOT** Boolean operator could eliminate relevant citations. Of the 3 Boolean operators, be cautious about using **NOT**.

PubMed automatically processes Boolean connectors in a left to right sequence, so when using multiple Boolean operators with more than two terms it may be important to enclose terms in parentheses, (tooth erosion **OR** tooth wear) **AND** (stannous fluoride toothpaste) **AND** (sodium fluoride and potassium nitrate toothpaste). The terms inside the parentheses, which is referred to as nesting, will be processed as a unit and then incorporated into the overall strategy.⁹

Boolean Operators can be used when typing in terms in the Search Box on the Home Page (Figure 1) and when using the Search Builder on the Advanced Search Page (Figure 6), which is accessed from the Home Page (found under the search box). Later you will see that Boolean

Operators also can be used in performing a search using Clinical Queries.

Advanced Search Builder and Search History Feature

Another valuable tool for conducting an evidence-based search is the Advanced Search Builder, including the Search History feature. This allows you to view all the search strategies that have been run and their results. It also allows you to combine previous search queries using the Boolean operators with new search queries. PubMed may move a search statement number to the top of the History when it's used again, so the search queries may appear to be out of numerical order. Note when combining searches, the terms do not need to be spelled out again. Instead of typing out toothpaste **AND** stannous fluoride, just type the number of the search, e.g., **#2 add with AND #3**. Please note, **you MUST use the # sign before the actual number**.

Using the Advanced Search Builder, you can see that the terms toothpaste (**#2**) AND stannous fluoride (**#3**) were then combined (**#4**), which then was combined with tooth erosion OR erosive tooth wear (**#1**). This limited the number of citations found to 63 (**#5**). Next, a search for sodium fluoride and potassium nitrate (**#6**) identified 100 citations. It then was combined with **#2** to limit the findings toothpaste. This resulted in 40 citations (**#7**). The final step was

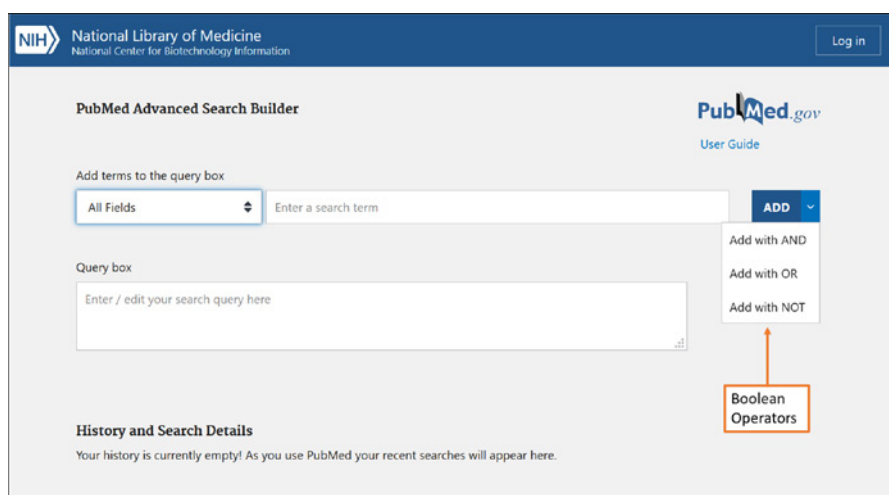


Figure 6. Boolean Operators as Part of Search Builder.

| History and Search Details | | | | | | Download | Delete |
|----------------------------|---------|---------|----------------------------------------------------------|---------|----------|----------|--------|
| Search | Actions | Details | Query | Results | Time | | |
| #8 | ... | > | Search: (#5) AND (#7) | 4 | 16:37:40 | | |
| #7 | ... | > | Search: (#6) AND (#2) | 40 | 16:36:45 | | |
| #6 | ... | > | Search: (sodium fluoride) AND (potassium nitrate) | 100 | 16:36:23 | | |
| #5 | ... | > | Search: #1 AND #4 | 63 | 16:35:30 | | |
| #4 | ... | > | Search: (#2) AND (#3) | 299 | 16:34:56 | | |
| #3 | ... | > | Search: stannous fluoride | 1,466 | 16:34:37 | | |
| #2 | ... | > | Search: toothpaste | 5,699 | 16:34:16 | | |
| #1 | ... | > | Search: (tooth erosion) OR (erosive tooth wear) | 3,542 | 16:33:57 | | |

Showing 1 to 8 of 8 entries

Figure 7a. Search History on Advanced Search Builder Page.

Pubmed.gov

(#5) AND (#7) Search

Advanced Create alert Create RSS User Guide

Save Email Send to Sorted by: Best match Display options

MY NCBI FILTERS

RESULTS BY YEAR

2011 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

4 results

☐ Caries-preventive effect of anti-**erosive** and nano-hydroxyapatite-containing **toothpastes** in vitro.

Cite Esteves-Oliveira M, Santos NMA, Meyer-Lueckel H, Wierichs RL, Rodrigues JA. Clin Oral Invest. 2017 Jan;21(1):291-300. doi: 10.1007/s00784-016-1789-0. Epub 2016 Mar 19. PMID: 26993660

Share OBJECTIVES: The aim of the study was to investigate the caries-preventive effect of newly developed **fluoride** and **fluoride-free toothpastes** specially designed for **erosion** prevention. ...CONCLUSION/CLINICAL RELEVANCE: While both anti-**erosive** and a ...

☐ A Randomized Clinical Trial to Measure the **Erosion** Protection Benefits of a Novel Stabilized **Stannous Fluoride** Dentifrice versus a Control Dentifrice.

Cite Zhao X, He T, He Y, Cheng C, Chen H. J Clin Dent. 2017 Dec;20(4 Spec No B):B17-20. PMID: 29334437 Clinical Trial.

Share OBJECTIVES: The aim of this investigation was to assess the **erosion** protection ability of a novel stabilized **stannous fluoride** (SnF₂) dentifrice and a control **sodium fluoride** dentifrice (NaF) using a well-credentialed human in situ model. METHOD ...

☐ A randomised in situ trial, measuring the anti-**erosive** properties of a **stannous**-containing **sodium fluoride** dentifrice compared with a **sodium fluoride/potassium nitrate** dentifrice.

Cite Hooper S, Seong J, Macdonald E, Claydon N, Hellin N, Barker ML, He T, West NX. Int Dent J. 2014 Mar;64 Suppl 1:35-42. doi: 10.1111/adj.12101. PMID: 24571703 Clinical Trial.

Share OBJECTIVES: To determine if a stabilised, **stannous**-containing **sodium fluoride** dentifrice provides greater enamel protection in situ against intraoral dietary **erosive** challenges compared with a **sodium fluoride/potassium nitrate** ...

☐ Conventional and anti-**erosion fluoride** toothpastes: effect on enamel **erosion** and **erosion-abrasion**.

Figure 7b. Studies Identified Using Advanced Search Builder.

combining searches **#5 AND #7** to identify studies that included both types of fluoride toothpaste and studies related to tooth erosion/erosive tooth wear in relation to tooth erosion (**#8**). This resulted in retrieving 4 studies. By clicking on 4 under the column Results, you can see the four studies (Figure 7b).

If none of these studies answers Nathan’s question, then the search needs to be

expanded by using broader or more generic terms as mentioned earlier.

As you can see from this search, terms were searched individually prior to combining them. This allows the user to see exactly what results were obtained for each term. Skipping the search for individual terms prior to combining them can result in missing important citations.

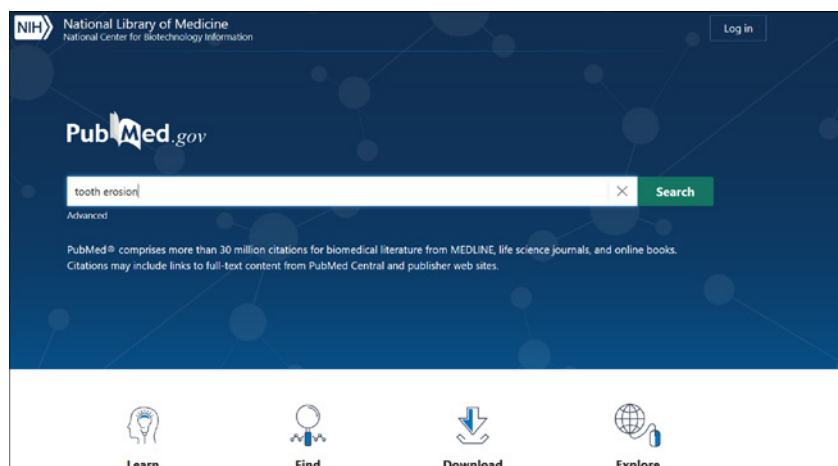


Figure 8. Beginning a Traditional/Comprehensive Search.

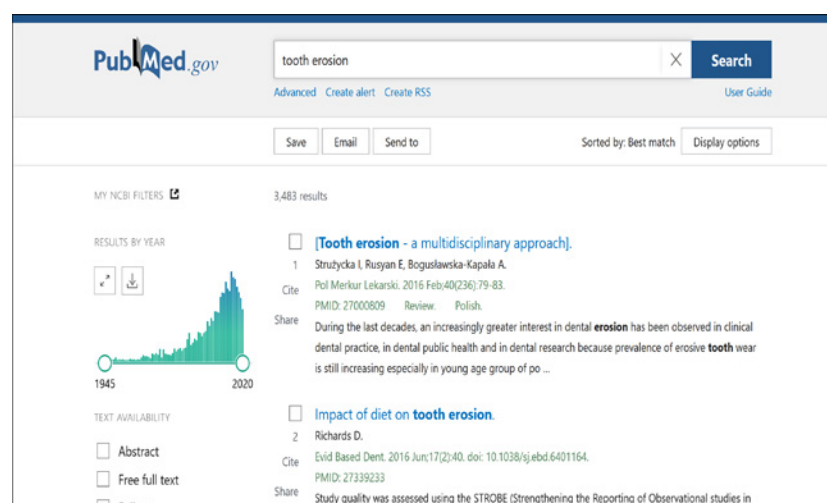


Figure 9a. Results of a Traditional/Comprehensive Search.

Conducting a Traditional or Comprehensive Search and the Use of Filters

Without knowing about or using the MeSH or Advanced search features, the most common way of beginning a search is to type in the main search term, tooth erosion, on the Homepage (Figure 8).

Next click on Search to see the results, which result in finding 3483 citations (Figure 9a). To narrow these results to the most current and highest levels of evidence, use the filters that appear on the left-hand column.

Scanning down the column you have choices related to Text Availability, Article Type, Publication Dates, and Additional Features (Figure 9b).

Clicking on Additional Features allows you to check off other Article Types, i.e., Practice Guideline and Comment, which are not a default publication type. Some of the other Additional Filters include Species, Languages, Sex, and Age (Figure 9c).

By clicking on SHOW, it places Practice Guideline and Comment under Article Type (Figure 9d). If you had clicked on any of the options under any of the Additional Filters, they too would appear on the main page.

Of all the filters, perhaps the most important is Article Types since it allows you to search for studies by levels of evidence.

ARTICLE ATTRIBUTE dietary habits on **tooth erosion** occurrence was calculated using a f ...

☐ 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

☐ Custom Range

☐ **A Dental Hygienist's and Therapist's Guide to the Management of **Tooth Erosion**.**

3 Ariyanayagam Y.

Cite Prim Dent J. 2016 Aug 1;5(3):58-62. doi: 10.1177/205016841600500306.

Share PMID: 28826465 Review.

Dental care professionals can support patients to prevent and manage **tooth erosion**. The role of the dentist is to restore the structure and function of teeth damaged by acid **erosion**, while the role of the dental hygienist therapist is to work alongside the de ...

☐ **Tooth erosion and eating disorders: a systematic review and meta-analysis.**

4 Hermont AP, Oliveira PA, Martins CC, Paiva SM, Pordeus IA, Auad SM.

Cite PLoS One. 2014 Nov 7;9(11):e111123. doi: 10.1371/journal.pone.0111123. eCollection 2014.

Share PMID: 25379668 Free PMC article. Review.

OBJECTIVES: The aim of this systematic review and meta-analysis was to search for scientific evidence regarding the following clinical question: Do eating disorders increase the risk of **tooth erosion**? METHODS: An electronic search addressing eating disorders and ...

☐ **Etiology and pathogenesis of dental **erosion**.**

5 Kanzow P, Wegehaupt FJ, Attin T, Wiegand A.

Cite Quintessence Int. 2016 Apr;47(4):275-8. doi: 10.3290/j.qia.35625.

Share PMID: 27022647 Review.

The condition of dental **erosion** is defined as acid-related loss of **tooth** structure which does not involve microorganisms. ... By a thorough clinical examination and an accurate anamnesis, various **erosion**-related risk factors can be identified and strategies to ...

Figure 9b. Customizing Article Types.

ARTICLE TYPE

SPECIES

LANGUAGE

SEX

SUBJECT

JOURNAL

AGE

☐ Clinical Trial Protocol

☐ Clinical Trial, Phase I

☐ Clinical Trial, Phase II

☐ Clinical Trial, Phase III

☐ Clinical Trial, Phase IV

☐ Clinical Trial, Veterinary

☒ Comment

☐ Comparative Study

☐ Congress

☐ Consensus Development Conference

☐ Consensus Development Conference, NIH

☐ Newspaper Article

☐ Observational Study

☐ Observational Study, Veterinary

☐ Overall

☐ Patient Education Handout

☐ Periodical Index

☐ Personal Narrative

☐ Portrait

☒ Practice Guideline

☐ Pragmatic Clinical Trial

☐ Preprint

Figure 9c. Customizing Article Types (Continued).

TEXT AVAILABILITY

☐ Abstract

☐ Free full text

☐ Full text

ARTICLE ATTRIBUTE

☐ Associated data

ARTICLE TYPE

☐ Books and Documents

☐ Clinical Trial

☐ Comment

☐ Meta-Analysis

☐ Practice Guideline

☐ Randomized Controlled Trial

☐ Review

☐ Systematic Review

☐ **Impact of diet on **tooth erosion**.**

2 Richards D.

Cite Evid Based Dent. 2016 Jun;17(2):40. doi: 10.1038/sj.ebd.6401164.

Share PMID: 27339233

Study quality was assessed using the STROBE (Strengthening the Reporting of Observational studies in Epidemiology) statement and Newcastle-Ottawa Quality Assessment Scale (NOS). The pooled effect of dietary habits on **tooth erosion** occurrence was calculated using a f ...

☐ **A Dental Hygienist's and Therapist's Guide to the Management of **Tooth Erosion**.**

3 Ariyanayagam Y.

Cite Prim Dent J. 2016 Aug 1;5(3):58-62. doi: 10.1177/205016841600500306.

Share PMID: 28826465 Review.

Dental care professionals can support patients to prevent and manage **tooth erosion**. The role of the dentist is to restore the structure and function of teeth damaged by acid **erosion**, while the role of the dental hygienist therapist is to work alongside the de ...

☐ **Tooth erosion and eating disorders: a systematic review and meta-analysis.**

4 Hermont AP, Oliveira PA, Martins CC, Paiva SM, Pordeus IA, Auad SM.

Cite PLoS One. 2014 Nov 7;9(11):e111123. doi: 10.1371/journal.pone.0111123. eCollection 2014.

Share PMID: 25379668 Free PMC article. Review.

OBJECTIVES: The aim of this systematic review and meta-analysis was to search for scientific evidence regarding the following clinical question: Do eating disorders increase the risk of **tooth erosion**? METHODS: An electronic search addressing eating disorders and ...

Figure 9d. Result of Adding Options under Article Types.

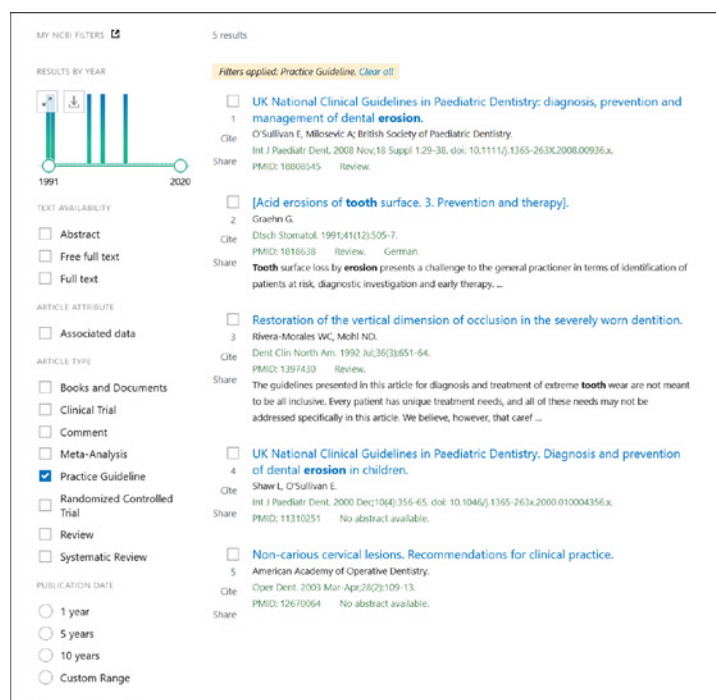


Figure 10. Using Filters to Narrow Citations to the Highest Level of Evidence, Practice Guideline.

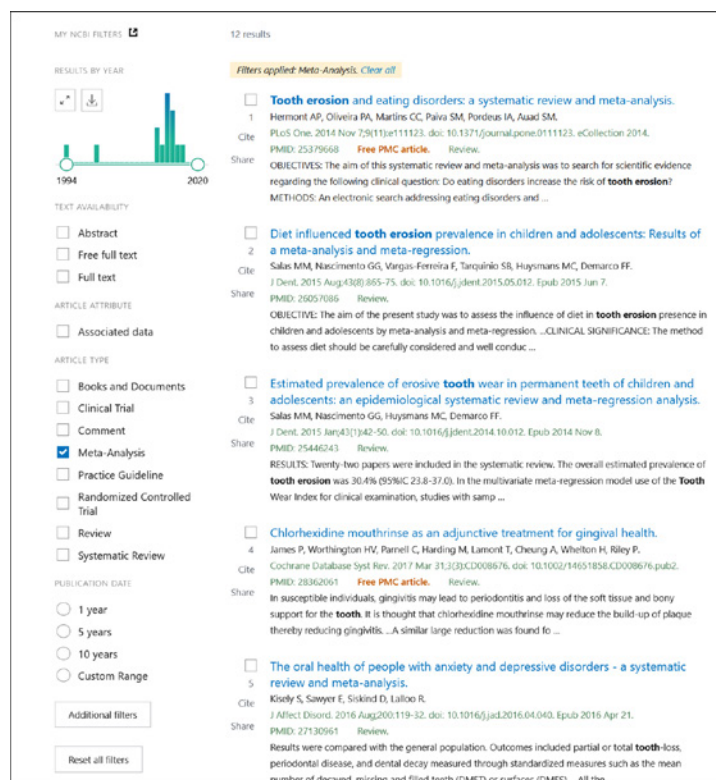


Figure 11. Using Filters to Narrow Citations to the Highest Level of Evidence, Meta-Analysis.

Figure 12. Additional Filters to Narrow Citations.

Figure 13. PubMed Clinical Queries.

Beginning with clicking on Practice Guideline, the highest level of evidence, the 3483 citations are narrowed to 5 (Figure 10), which is much more reasonable to review. However, notice that the most recent one, #1, was published in 2008.

If no Practice Guideline was identified or none of those found answer your question, then re-run the search. First clear the filter by clicking on “Clear all” to remove its selection. Next, click on Meta-Analysis, the next highest level of evidence. In this case, 12 citations are identified (Figure 11). Again, it’s important to only click on one filter at a time so that you know what level of evidence you have found.

If no Meta-Analysis is found, then re-run the search again by clicking on “Clear all” to remove Meta-Analysis and click on Systematic Reviews, the next highest level. There are 32 for this search. Continue this process so that you are able to identify the highest levels of evidence that answers your question. For a review of levels of evidence and the hierarchy that exists to guide clinical decision making see [Evidence-Based Decision Making: Introduction and Formulating Good Clinical Questions](#).¹

If there had been a large number of citations, another option is to use the “Publication Date”

filter to limit the findings to the past 5 or 10 years. Also, if focusing on a specific age group, click on **Show additional features** and select the appropriate age group (Figure 12).

Searching with PubMed Clinical Queries

Now that the basics of PubMed have been reviewed, rather than beginning a PubMed search on the homepage using a traditional or comprehensive approach, a valuable feature for answering clinical questions for busy professionals and students is **PubMed Clinical Queries**. Click on the link found on the Homepage under PubMed Tools (Figure 1). The Clinical Queries feature (Figure 13) provides specialized searches using evidence-based filters to retrieve articles. The built-in evidence-based algorithms streamline the process of searching for clinically relevant articles.

Of the options on the Clinical Queries page, our focus is on using the main search bar and the **Clinical Study Categories**. Special algorithms are designed to find relevant evidence under the each Category. The default category is Therapy, however by clicking on the drop-down menu, other categories are found, such as Clinical Prediction Guides, Diagnosis, Etiology, and Prognosis. These can be searched with a broad or

The screenshot displays the PubMed Clinical Queries interface. At the top, a search bar contains the query "Tooth Erosion OR Erosive Tooth Wear" with a "Search" button. Below the search bar, there are two main sections: "COVID-19 Articles" and "Clinical Study Categories".

COVID-19 Articles: The "Category" dropdown is set to "Treatment". A note states: "This column displays citations about the 2019 novel coronavirus filtered by research topic categories. See more [filter information](#)."

Clinical Study Categories: The "Category" dropdown is set to "Therapy" and the "Scope" dropdown is set to "Narrow". It shows "5 of 225 results".

Search Results (Clinical Study Categories - Therapy, Narrow):

- Evaluation of Gingival Displacement with Aluminum Chloride and Naphazoline Hydrochloride: A Randomized Controlled Trial.**
de Carvalho WF, et al. Eur J Prosthodont Restor Dent. 2020. PMID: 33026719
- Efficacy of a Stannous-containing Dentifrice for Protecting Against Combined Erosive and Abrasive Tooth Wear In Situ.**
Zhao X, et al. Oral Health Prev Dent. 2020. PMID: 32705075 Clinical Trial.
- Influence of the long-term use of oral hygiene products containing stannous ions on the salivary microbiome - a randomized controlled trial.**
Anderson AC, et al. Sci Rep. 2020. PMID: 32530115 [Free PMC article](#).
- Abfraction: Etiopathogenesis, clinical aspect, and diagnostic-treatment modalities: A review.**
Badamnavar AN, et al. Indian J Dent Res. 2020. PMID: 32436913 [Free article](#). Review.
- In situ efficacy of an experimental toothpaste on enamel rehardening and prevention of demineralisation: a randomised, controlled trial.**
Creeth JE, et al. BMC Oral Health. 2020. PMID: 32303206 [Free PMC article](#). Clinical Trial.

At the bottom right of the results section, it says "See all (225)".

Clinical Study Categories (Right Panel): This panel shows the "Category" dropdown set to "Therapy" and the "Scope" dropdown set to "Broad". It shows "5 of 1,739 results".

Search Results (Clinical Study Categories - Therapy, Broad):

- Pellicle Modification with Casein and Mucin Does Not Affect Surface Loss from Erosion and Abrasion.**
Baumann T, et al. Caries Res. 2020. PMID: 33113528
- Protective effect of fluorides on erosion and erosion/abrasion in enamel: a systematic review and meta-analysis of randomized in situ trials.**
Zanatta RF, et al. Arch Oral Biol. 2020. PMID: 33113459 Review.
- Evaluation of Gingival Displacement with Aluminum Chloride and Naphazoline Hydrochloride: A Randomized Controlled Trial.**
de Carvalho WF, et al. Eur J Prosthodont Restor Dent. 2020. PMID: 33026719
- Accuracy of remote diagnoses using intraoral scans captured in approximate true color: a pilot and validation study in telerdentistry.**
Stammes S, et al. BMC Oral Health. 2020. PMID: 32977794 [Free PMC article](#).
- Effect of in situ aspartame mouthwash to prevent intrinsic and extrinsic erosive tooth wear.**
Konta PQ, et al. J Clin Exp Dent. 2020. PMID: 32950716 [Free PMC article](#).

At the bottom right of the results section, it says "See all (1,739)".

A note at the bottom of the right panel states: "This column displays citations filtered to a specific clinical study category and scope. These search filters were developed by Hagman RB et al. See more [filter information](#)."

Figure 14. Clinical Queries Results of Searching for Tooth Erosion OR Erosive Tooth Wear.

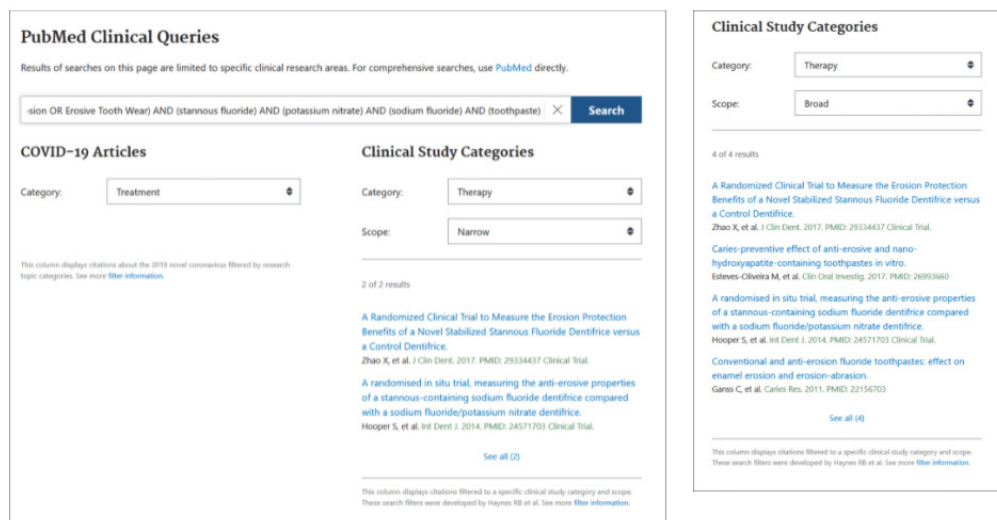


Figure 15a. Clinical Queries Results of Searching for the P, I and C components.

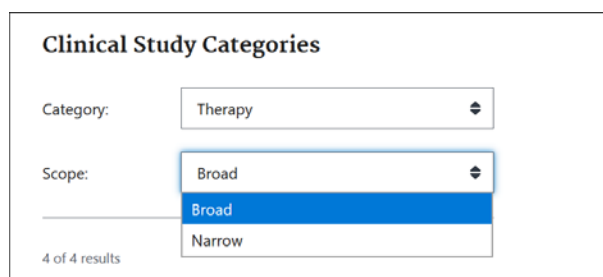


Figure 15b. Clinical Study Categories: Changing the Scope from Broad to Narrow.

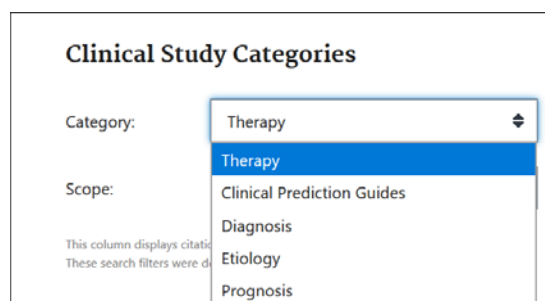


Figure 16. Clinical Study Categories: Changing the Scope from Broad to Narrow.

narrow focus. Broad is the default so by using the drop-down menu narrow can be selected.

Clinical Queries allows an individual with limited computer searching skills to find high levels of evidence by typing in a main topic or specific terms of interest. Using the same clinical scenario, “tooth erosion OR erosive tooth wear” is typed into the search box (Figure 14).

In this case, 1739 results were retrieved under a broad scope and 225 results under a narrow scope in Clinical Study Categories. To further narrow these, include Stannous fluoride (I) AND (Potassium nitrate AND sodium fluoride) AND toothpaste (C), Figure 15a.

In this case, 2 were found using the Narrow Scope and 4 were found using the Broad

Scope. These same studies are found under the Advanced Search Builder, Figure 7, result #8. Therefore, it is possible in two steps using Clinical Queries (vs. 7 steps and the use of Boolean operators, Figure 7a) to identify relevant studies to answer the question.

Review the abstracts found under the Clinical Study Categories. This search uses evidence-based search filters to find **individual studies** in the indicated category. The default settings are ‘Therapy’ under Category and ‘Broad’ under Scope, since the majority of questions asked fall under the category of therapy. The type of studies retrieved for this category and scope are randomized controlled trials (see filter table link at bottom of the webpage). If there were hundreds of studies, then change the Scope to Narrow (Figure 15b) and this will reduce the

number of citations. A Narrow, specific search will return the most relevant citations, although it may miss some.

In our case, with only 4 citations returned, there was no need to change the scope from Broad to Narrow. However, our graphic shows that a narrow search reduces the results to 2 citations.

Another important consideration is the type of question/category for which an answer is being sought, i.e., does the question pertain to etiology (or harm), diagnosis, therapy, prognosis or clinical prediction guides (Figure 16). Make sure the correct category is checked off.

Although there is no one correct way to conduct a search, how search terms are entered influences the results and the number of steps needed to refine the search.

PubMed Clinical Queries in Action

To further demonstrate searching with PubMed Clinical Queries let's review a second case scenario.

Case Scenario #2

To further demonstrate searching with PubMed Clinical Queries let's review a second case scenario.

Eric is a twenty-seven-year-old bartender who has used chewing tobacco for 9 years. He is a frequent user who chews almost five hours a day. Eric knows he can't quit by will power alone because he has tried in the past. He wants to know if using a nicotine patch rather than behavioral counseling can help him permanently quit.

To locate the highest level of evidence, begin with the Clinical Queries feature (Figure 17) by typing in the main problem of interest, chewing tobacco cessation. In this case we also will combine it with the Intervention, nicotine patch, and the Comparison, behavior counseling, using the **"and"** Boolean operator.

The results of the search identified 33 citations under Clinical Study Categories, the Broad Scope and 18 under the Narrow Scope.

In reviewing the title of the citations it should occur to the user that perhaps 'chewing tobacco' is not the correct indexing term since 'smokeless tobacco' is used and nowhere is 'chewing tobacco' used in the title of any citation. In this case, you should search the MeSH Database to determine the correct term. You discover that the MeSH term for chewing tobacco is smokeless tobacco and see that it is the correct indexing term in the MeSH hierarchy (Figure 18a). Searching for smokeless

The image shows two side-by-side screenshots of the PubMed Clinical Queries interface. The left screenshot displays the search results for the query "chewing tobacco cessation AND nicotine patch AND behavior counseling". It shows two tabs: "COVID-19 Articles" and "Clinical Study Categories". The "Clinical Study Categories" tab is selected, showing 18 results. The results are listed with their titles, authors, and PMIDs. The right screenshot shows the "Clinical Study Categories" search interface. It has a "Category" dropdown set to "Therapy" and a "Scope" dropdown set to "Broad". It shows 33 results.

PubMed Clinical Queries
Results of searches on this page are limited to specific clinical research areas. For comprehensive searches, use PubMed directly.

chewing tobacco cessation AND nicotine patch AND behavior counseling

COVID-19 Articles
Category: Treatment

Clinical Study Categories
Category: Therapy
Scope: Narrow

5 of 18 results

Combined nicotine patch with gum versus nicotine patch alone in smoking cessation in Hong Kong primary care clinics: a randomised controlled trial.
Leung MKW, et al. BMC Public Health. 2019; PMID: 31615025
Free PMC article. Clinical Trial.

Using Nicotine Gum to Assist Nondaily Smokers in Quitting: A Randomized Clinical Trial.
Shihman S, et al. Nicotine Tob Res. 2020; PMID: 31125988
Free PMC article. Clinical Trial.

Effectiveness of a new multi-component smoking cessation service package for patients with hypertension and diabetes in northern Thailand: a randomized controlled trial (ESCAPE study).
Aung MN, et al. Subst Abuse Treat Prev Policy. 2019; PMID: 30795811
Free PMC article. Clinical Trial.

Can we increase smokers' adherence to nicotine replacement therapy and does this help them quit?
Schlam TR, et al. Psychopharmacology (Berl). 2018; PMID: 29083111
Free PMC article. Clinical Trial.

Randomized Trial to Compare Smoking Cessation Rates of Snus, With and Without Smokeless Tobacco Health-Related Information, and a Nicotine Lozenge.
Nelson PR, et al. Nicotine Tob Res. 2019; PMID: 29373695
Free PMC article. Clinical Trial.

See all (18)

Clinical Study Categories
Category: Therapy
Scope: Broad

5 of 33 results

Combined nicotine patch with gum versus nicotine patch alone in smoking cessation in Hong Kong primary care clinics: a randomised controlled trial.
Leung MKW, et al. BMC Public Health. 2019; PMID: 31615025
Free PMC article. Clinical Trial.

Using Nicotine Gum to Assist Nondaily Smokers in Quitting: A Randomized Clinical Trial.
Shihman S, et al. Nicotine Tob Res. 2020; PMID: 31125988
Free PMC article. Clinical Trial.

Effects of motivation phase intervention components on quit attempts in smokers unwilling to quit: A factorial experiment.
Engle A, et al. Drug Alcohol Depend. 2019; PMID: 30825795
Free PMC article.

Effectiveness of a new multi-component smoking cessation service package for patients with hypertension and diabetes in northern Thailand: a randomized controlled trial (ESCAPE study).
Aung MN, et al. Subst Abuse Treat Prev Policy. 2019; PMID: 30795811
Free PMC article. Clinical Trial.

Can we increase smokers' adherence to nicotine replacement therapy and does this help them quit?
Schlam TR, et al. Psychopharmacology (Berl). 2018; PMID: 29083111
Free PMC article. Clinical Trial.

See all (33)

Figure 17. Search Results for Chewing Tobacco Cessation, Nicotine Patch and Behavior Counseling.

tobacco cessation (using the correct MeSH term from chewing tobacco) results in the MeSH term Tobacco Use Cessation (Figure 18b).

The MeSH term for nicotine patch is Tobacco Use Cessation Devices and is a new MeSH term introduced in 2019 (Figure 18c). Finally Behavioral Counseling is not a MeSH term and typing counseling provides several options to choose from (Figure 18d.). Directive Counseling is probably the closest definition to what we are investigating for Eric. However, we can see that it is indexed under Counseling and for this search we select Counseling as the MeSH term to capture a broader scope in potential relevant articles (Figure 18e).

A new search can be generated right from the MeSH database by adding MeSH terms to the search builder as you explore terms. This is done by selecting the search term (if there is

more than one listed) and clicking on the Add to search builder button on the right side of the screen. Terms can be combined with the Boolean operators AND/OR/NOT and a search can be generated (Figure 19a). When all of the terms are added, and combined with your choice of Boolean operator, click on Search Pubmed (Figure 19b.) Based on the MeSH terms a new search query is run and 3 potentially relevant citations are identified (Figure 19c.). The search query can be highlighted and copied using CTRL+C and pasted into clinical queries as well for the same results (Figure 19d).

As demonstrated, there is no one correct way to conduct a search and for someone who is not familiar with Boolean operators and combining terms, the filters feature or the MeSH database, so the Clinical Queries feature is an excellent starting point. For example, if the Clinical Queries search just included “chewing tobacco cessation,”

Tobacco, Smokeless
Any product of NICOTIANA TABACUM that is not smoked but is either inhaled through the nose, chewed, or stored in cheek pouches.
Year introduced: 1991(1986)

PubMed search builder options
[Subheadings:](#)

☐ administration and dosage
☐ adverse effects
☐ analysis
☐ chemistry
☐ classification
☐ drug effects
☐ economics
☐ etiology

☐ history
☐ isolation and purification
☐ legislation and jurisprudence
☐ metabolism
☐ microbiology
☐ organization and administration
☐ pharmacokinetics
☐ pharmacology

☐ physiology
☐ poisoning
☐ standards
☐ statistics and numerical data
☐ supply and distribution
☐ therapeutic use
☐ toxicity
☐ virology

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

Tree Number(s): J01.637.767.844.500
MeSH Unique ID: D014030
Entry Terms:

- Smokeless Tobacco
- Tobaccos, Smokeless
- Gutka
- Gutkas
- Gutka Tobacco
- Gutka Tobaccos
- Tobacco, Gutka
- Tobaccos, Gutka
- Snus
- Dipping Tobacco
- Dipping Tobaccos
- Tobacco, Dipping
- Tobaccos, Dipping
- Oral Tobacco
- Tobacco, Oral
- Chewing Tobacco
- Chewing Tobaccos
- Tobacco, Chewing
- Tobaccos, Chewing
- Snuff
- Mint Snuff
- Snuff, Mint

[All MeSH Categories](#)
[Technology and Food and Beverages Category](#)
[Technology, Industry, and Agriculture](#)
[Manufactured Materials](#)
[Smoking Devices](#)
[Tobacco Products](#)
Tobacco, Smokeless

Figure 18a. MeSH Database Search for Chewing Tobacco.

Tobacco Use Cessation
Ending the TOBACCO habits of smoking, chewing, or snuff use.
Year introduced: 1999

PubMed search builder options
[Subheadings:](#)

| | | |
|---------------------------------------|----------------------------------------------------------|--------------------------------------------------------|
| <input type="checkbox"/> economics | <input type="checkbox"/> history | <input type="checkbox"/> psychology |
| <input type="checkbox"/> epidemiology | <input type="checkbox"/> methods | <input type="checkbox"/> statistics and numerical data |
| <input type="checkbox"/> ethnology | <input type="checkbox"/> organization and administration | |

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

Tree Number(s): F01.145.488.750
MeSH Unique ID: D020340
Entry Terms:

- Cessation, Tobacco Use
- Cessations, Tobacco Use
- Tobacco Cessation
- Cessation, Tobacco
- Smokeless Tobacco Cessation
- Cessation, Smokeless Tobacco

See Also:

- [Tobacco Use Cessation Devices](#)

[All MeSH Categories](#)
[Psychiatry and Psychology Category](#)
[Behavior and Behavior Mechanisms](#)
[Behavior](#)
[Health Behavior](#)

Tobacco Use Cessation

Figure 18b. MeSH Database Search for Smokeless Tobacco Cessation.

Tobacco Use Cessation Devices
Devices or delivery systems used to aid in ending a TOBACCO habit.
Year introduced: 2019(1968)

PubMed search builder options
[Subheadings:](#)

| | | |
|------------------------------------------|----------------------------------------------------------|--------------------------------------------------------|
| <input type="checkbox"/> adverse effects | <input type="checkbox"/> history | <input type="checkbox"/> statistics and numerical data |
| <input type="checkbox"/> analysis | <input type="checkbox"/> organization and administration | <input type="checkbox"/> supply and distribution |
| <input type="checkbox"/> classification | <input type="checkbox"/> pharmacology | <input type="checkbox"/> therapeutic use |
| <input type="checkbox"/> economics | <input type="checkbox"/> standards | <input type="checkbox"/> trends |
| <input type="checkbox"/> ethics | | |

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

Tree Number(s): E02.980
MeSH Unique ID: D061485
Entry Terms:

- Nicotine Patch
- Patch, Nicotine
- Nicotine Transdermal Patch
- Patch, Nicotine Transdermal
- Transdermal Patch, Nicotine
- Nicotine Polacrilex
- Polacrilex, Nicotine
- Nicotine Inhalant
- Inhalant, Nicotine
- Inhalants, Nicotine
- Nicotine Inhalants
- Nicotine Delivery Devices
- Delivery Device, Nicotine
- Delivery Devices, Nicotine
- Device, Nicotine Delivery
- Devices, Nicotine Delivery
- Nicotine Delivery Device
- Nicotine Nasal Spray
- Nasal Spray, Nicotine
- Nasal Sprays, Nicotine
- Nicotine Nasal Sprays
- Spray, Nicotine Nasal
- Sprays, Nicotine Nasal
- Smoking Cessation Products
- Product, Smoking Cessation
- Products, Smoking Cessation
- Smoking Cessation Product
- Tobacco Use Cessation Products
- Nicotine Replacement Products
- Nicotine Replacement Product
- Product, Nicotine Replacement
- Products, Nicotine Replacement
- Replacement Product, Nicotine
- Replacement Products, Nicotine
- Nicotine Lozenge
- Lozenge, Nicotine
- Lozenges, Nicotine
- Nicotine Lozenges

See Also:

- [Smoking Cessation Agents](#)
- [Tobacco Use Cessation](#)

[All MeSH Categories](#)
[Analytical, Diagnostic and Therapeutic Techniques and Equipment Category](#)
[Therapeutics](#)

Tobacco Use Cessation Devices
[Nicotine Chewing Gum](#)

Figure 18c. MeSH Database Search for Nicotine Patch.

Search results

Items: 6

- ☐ **Counseling**
1. The giving of advice and assistance to individuals with educational or personal problems.
Year introduced: 1900(1964)
- ☐ **Directive Counseling**
2. **Counseling** during which a professional plays an active role in a client's or patient's decision making by offering advice, guidance, and/or recommendations.
Year introduced: 2003
- ☐ **Sex Counseling**
3. Advice and support given to individuals to help them understand and resolve their sexual adjustment problems. It excludes treatment for PSYCHOSEXUAL DISORDERS or PSYCHOSEXUAL DYSFUNCTION.
Year introduced: 1988
- ☐ **Genetic Counseling**
4. An educational process that provides information and advice to individuals or families about a genetic condition that may affect them. The purpose is to help individuals make informed decisions about marriage, reproduction, and other health management issues based on information about the genetic disease, the available diagnostic tests, and management programs. Psychosocial support is usually offered.
Year introduced: 1973
- ☐ **Distance Counseling**
5. **Counseling** conducted via electronic or other non-face-to-face interactions.
Year introduced: 2016
- ☐ **Vocational Guidance**
6. Systematic efforts to assist individuals in selecting an occupation or suitable employment on the basis of aptitude, education, etc.

Figure 18d. MeSH Database Search for Counseling.

Directive Counseling

Counseling during which a professional plays an active role in a client's or patient's decision making by offering advice, guidance, and/or recommendations.
Year introduced: 2003

PubMed search builder options
[Subheadings](#)

| | | |
|-----------------------------------------|----------------------------------------------------------|--------------------------------------------------------|
| <input type="checkbox"/> classification | <input type="checkbox"/> legislation and jurisprudence | <input type="checkbox"/> statistics and numerical data |
| <input type="checkbox"/> economics | <input type="checkbox"/> methods | <input type="checkbox"/> supply and distribution |
| <input type="checkbox"/> ethics | <input type="checkbox"/> organization and administration | <input type="checkbox"/> trends |
| <input type="checkbox"/> history | <input type="checkbox"/> standards | |

☐ Restrict to MeSH Major Topic.

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

Tree Number(s): F02.784.176.279, F04.408.413.349, N02.421.461.363.349
MeSH Unique ID: D037001

Entry Terms:

- Counseling, Directive
- Prescriptive Counseling
- Counseling, Prescriptive

See Also:

- [Genetic Counseling](#)

[All MeSH Categories](#)

- Psychiatry and Psychology Category
 - Psychological Phenomena
 - Psychology, Applied
 - Counseling**
 - Directive Counseling**
 - [Motivational Interviewing](#)

- [All MeSH Categories](#)
- Psychiatry and Psychology Category
 - Behavioral Disciplines and Activities
 - Mental Health Services
 - Counseling**
 - Directive Counseling**
 - [Motivational Interviewing](#)
- [All MeSH Categories](#)
- Health Care Category
 - Health Care Facilities, Manpower, and Services
 - Health Services
 - Mental Health Services
 - Counseling**
 - Directive Counseling**
 - [Motivational Interviewing](#)

Figure 18e. MeSH Database Description for Directive Counseling.

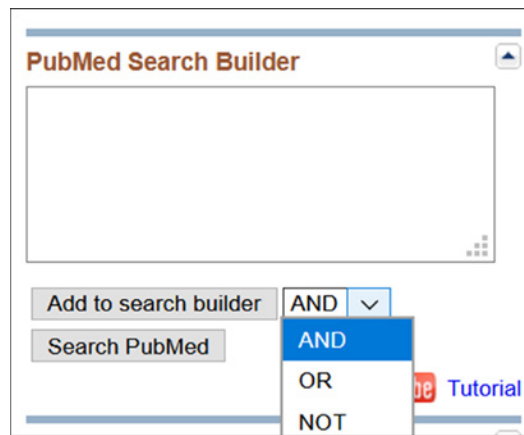


Figure 19a. PubMed Search Builder in MeSH Database.

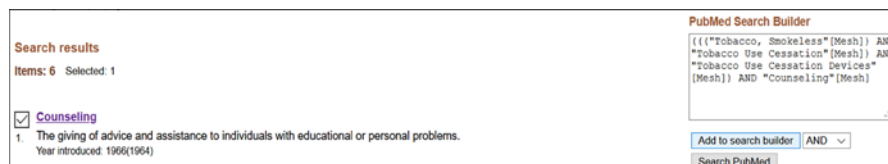


Figure 19b. PubMed Search Builder with MeSH terms for Eric.

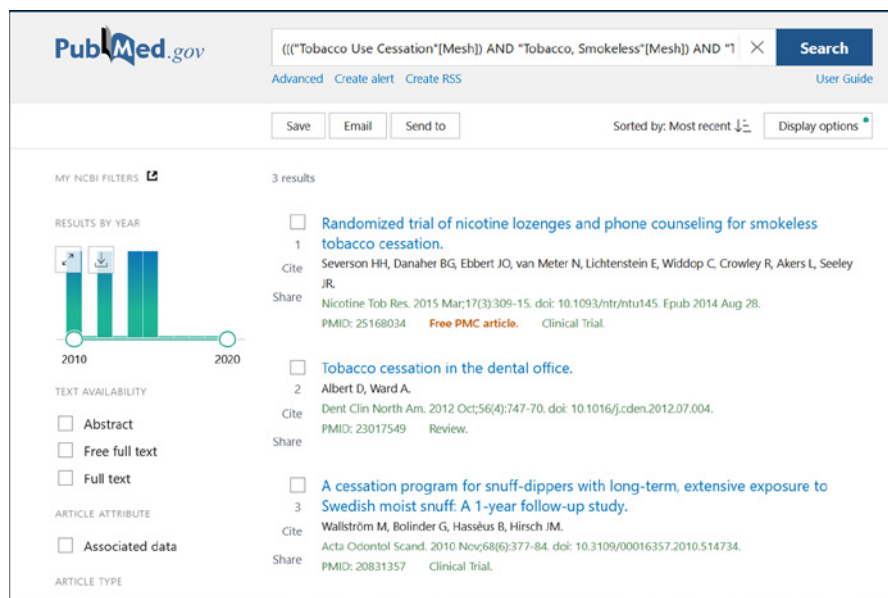


Figure 19c. PubMed Results of Search for Smokeless Tobacco AND Tobacco Use Cessation AND Tobacco Use Cessation Devices AND Counseling.

PubMed Clinical Queries

Results of searches on this page are limited to specific clinical research areas. For comprehensive searches, use [PubMed](#) directly.

s"[Mesh]) AND "Tobacco Use Cessation"[Mesh]) AND "Tobacco Use Cessation Devices"[Mesh]) AND "Counseling"[Mesh] X **Search**

COVID-19 Articles

Category:

This column displays citations about the 2019 novel coronavirus filtered by research topic categories. See more [filter information](#).

Clinical Study Categories

Category:

Scope:

3 of 3 results

[Randomized trial of nicotine lozenges and phone counseling for smokeless tobacco cessation.](#)
Severson HH, et al. Nicotine Tob Res. 2015. PMID: 25168034
[Free PMC article.](#) Clinical Trial.

[Tobacco cessation in the dental office.](#)
Albert D, et al. Dent Clin North Am. 2012. PMID: 23017549 Review.

[A cessation program for snuff-dippers with long-term, extensive exposure to Swedish moist snuff: A 1-year follow-up study.](#)
Wallström M, et al. Acta Odontol Scand. 2010. PMID: 20831357
Clinical Trial.

[See all \(3\)](#)

This column displays citations filtered to a specific clinical study category and scope. These search filters were developed by Haynes RB et al. See more [filter information](#).

Figure 19d. Clinical Queries Results of Search for Smokeless Tobacco AND Tobacco Use Cessation AND Tobacco Use Cessation Devices AND Counseling.

840 citations are identified (Figure 20). Changing the search to include the MeSH terms, Tobacco Use Cessation AND Smokeless Tobacco results in 109 or 32 citations broad/narrow respectively (Figure 21.). However, all of these do not necessarily focus the search on the chief concern of Eric, which is the effectiveness of the nicotine patch as compared to behavioral counseling on quitting chewing tobacco.

To narrow the 109 or 32 citations, scan down the page and click on **See all (109)** or **See all (32)** to apply filters. It brings up all 109/32 citations on the Results page and by selecting the Publication dates filter, you can identify those published within the last 5 years, narrowing the results from 109 to 14 citations (Figure 22). Adding article type filters, one is a meta-analysis (Figure 23.) and two are systematic reviews (Figure 24.). However, there's no guarantee that any of the abstracts address the real problem of whether a nicotine patch will be more effective than behavioral counseling in helping Eric permanently quit using smokeless tobacco.

Comparison of Using a PubMed Comprehensive Search Approach vs. Clinical Queries

To compare the searching strategies, let's conduct a PubMed comprehensive search (See Figure 1) to answer Eric's question. This is the traditional or typical approach that individuals use if they are not familiar with the Clinical Queries feature. Beginning on the PubMed homepage, the MeSH term, Tobacco Use Cessation is typed into the search box resulting in the retrieval of 21,774 citations (Figure 25a). A disadvantage to conducting this type of search is that you have no idea as to what type of studies you have found, e.g., systematic reviews, RCTs, animal or laboratory studies, personal opinions, etc. In comparison, using a non-mesh term, Chewing Tobacco Cessation only results in 1,426 citations (Figure 25b.) as compared to using the MeSH term.

In this case, someone not familiar with the PubMed Limits feature would either spend considerable time reviewing the 21,774 titles and abstracts to determine which ones might be useful in answering the question, or more

PubMed Clinical Queries

Results of searches on this page are limited to specific clinical research areas. For comprehensive searches, use PubMed directly.

tobacco use cessation

Search

COVID-19 Articles

Category:

Treatment

Clinical Study Categories

Category:

Therapy

Scope:

Broad

5 of 19 results

Tobacco use disorder and the lungs.
McRobbie H, et al. Addictions. 2020. PMID: 33140509

COVID-19 pandemic: an opportunity for tobacco use cessation.
Ahluwalia IB, et al. Lancet Public Health. 2020. PMID: 33120038
[Free PMC article](#). No abstract available.

How has the COVID-19 pandemic affected tobacco users in India: Lessons from an ongoing tobacco cessation program.
Gupte HA, et al. Tob Prev Cessat. 2020. PMID: 33083681 [Free PMC article](#).

Impact of the COVID-19 pandemic on telehealth research in cancer prevention and care: A call to sustain telehealth advances.
Park ER, et al. Cancer. 2020. PMID: 33048350 [Free PMC article](#).

Preferences for Tobacco Cessation Information and Support During Covid-19.
Pettigrew S, et al. J Addict Med. 2020. PMID: 32941292

[See all \(19\)](#)

This column displays citations about the 2019 novel coronavirus filtered by research topic categories. See more [filter information](#).

5 of 9,956 results

The Relationship of E-Cigarette Use to Tobacco Use Outcomes Among Young Adults Who Smoke and Use Alcohol.
Yonek JC, et al. J Addict Med. 2020. PMID: 33229934

Targeting mailed nicotine patch distribution interventions to rural regions of Canada: protocol for a randomized controlled trial.
Cunningham JA, et al. BMC Public Health. 2020. PMID: 33228625

Effectiveness of training stop-smoking advisers to deliver cessation support to the UK national proposed standard versus usual care in Malaysia: a two-arm cluster randomised controlled trial.
Wee LH, et al. Addiction. 2020. PMID: 33220115

The Effect of Acute Interpersonal Racial Discrimination on Smoking Motivation and Behavior Among Black Smokers: an Experimental Study.
Calote-Civil PF, et al. J Racial Ethn Health Disparities. 2020. PMID: 33215359

Linkage of Maternal Caregiver Smoking Behaviors on Environmental and Clinical Outcomes of Children with Asthma: A Post-Hoc Analysis of a Financial Incentive Trial Targeting Reduction in Pediatric Tobacco Smoke Exposures.
Jassal MS, et al. Int J Environ Res Public Health. 2020. PMID: 33212796

[See all \(9,956\)](#)

Figure 20. Results of Clinical Queries Search for Tobacco Use Cessation.

PubMed Clinical Queries

Results of searches on this page are limited to specific clinical research areas. For comprehensive searches, use PubMed directly.

"Tobacco Use Cessation"[Mesh] AND "Smokeless Tobacco"[Mesh]

Search

COVID-19 Articles

Category:

Treatment

Clinical Study Categories

Category:

Therapy

Scope:

Broad

5 of 109 results

Behavioral Interventions for Smokeless Tobacco Cessation.
Nathan ST, et al. Nicotine Tob Res. 2020. PMID: 31251347

Effect of a Responsiveness-Based Support Intervention on Smokeless Tobacco Cessation: The UCare-ChewFree Randomized Clinical Trial.
Altem L, et al. Nicotine Tob Res. 2020. PMID: 31070741 [Free PMC article](#). Clinical Trial.

Perception of health professions students of their role model status in tobacco cessation: A cross-sectional study from Sudan.
Ahmed RM, et al. PLoS One. 2019. PMID: 30730905 [Free PMC article](#). Clinical Trial.

An update on prevalence and risk of snus and nicotine replacement therapy during pregnancy and breastfeeding.
Knyazov L, et al. Acta Paediatr. 2019. PMID: 30710748 Review.

Smokeless tobacco cessation interventions: A systematic review.
Nathan ST, et al. Indian J Med Res. 2018. PMID: 30666002 [Free PMC article](#).

[See all \(109\)](#)

This column displays citations about the 2019 novel coronavirus filtered by research topic categories. See more [filter information](#).

Clinical Study Categories

Category:

Therapy

Scope:

Narrow

5 of 32 results

Effect of a Responsiveness-Based Support Intervention on Smokeless Tobacco Cessation: The UCare-ChewFree Randomized Clinical Trial.
Altem L, et al. Nicotine Tob Res. 2020. PMID: 31070741 [Free PMC article](#). Clinical Trial.

Switching from usual brand cigarettes to a tobacco-heating cigarette or snus: Part 2. Biomarkers of exposure.
Ogden MW, et al. Biomarkers. 2015. PMID: 26534277 [Free PMC article](#). Clinical Trial.

Switching from usual brand cigarettes to a tobacco-heating cigarette or snus: Part 3. Biomarkers of biological effect.
Ogden MW, et al. Biomarkers. 2015. PMID: 26525962 [Free PMC article](#). Clinical Trial.

Switching from usual brand cigarettes to a tobacco-heating cigarette or snus: Part 1. Study design and methodology.
Ogden MW, et al. Biomarkers. 2015. PMID: 26525849 [Free PMC article](#). Clinical Trial.

Nicotine Metabolic Ratio Is Associated With Lozenge Use But Not Quitting in Smokeless Tobacco Users.
Hawthorn KJ, et al. Nicotine Tob Res. 2016. PMID: 27071408 [Free PMC article](#). Clinical Trial.

[See all \(32\)](#)

Figure 21. Results of Clinical Queries Search for MeSH terms Tobacco Use Cessation AND Smokeless Tobacco.

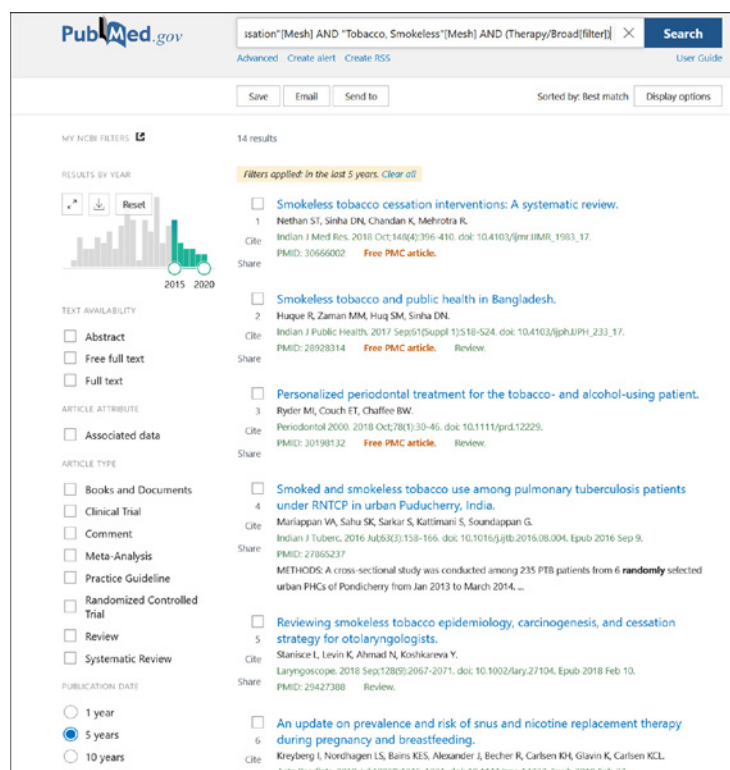


Figure 22. Clinical Queries Search Results with 5 Year Limit.

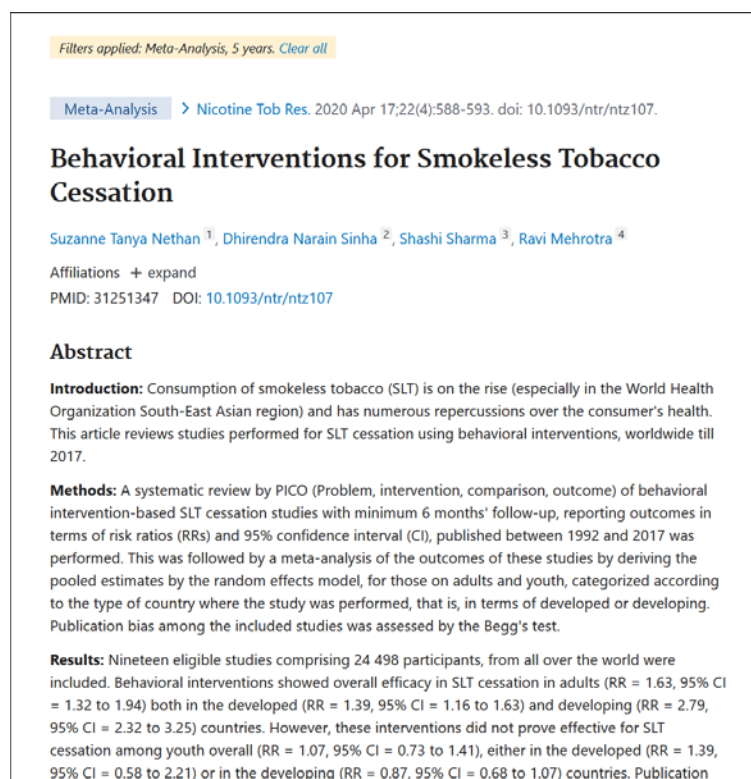


Figure 23. Clinical Queries Search Results with 5 Year Limit and Meta-Analysis Filter.

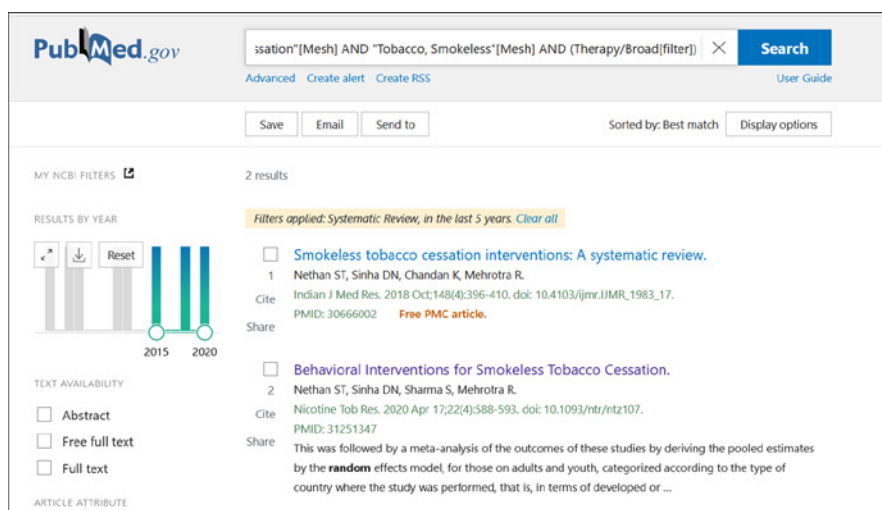


Figure 24. Results of Clinical Queries Search Filter 5 year limit and Systematic Reviews.

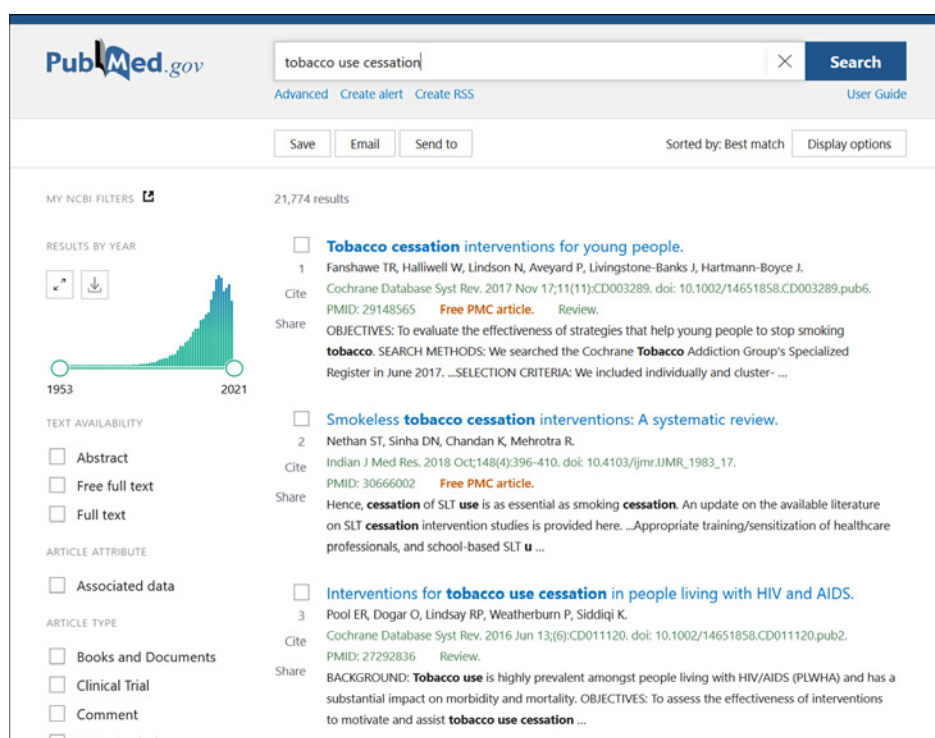


Figure 25a. Traditional PubMed Search for Tobacco Use Cessation.

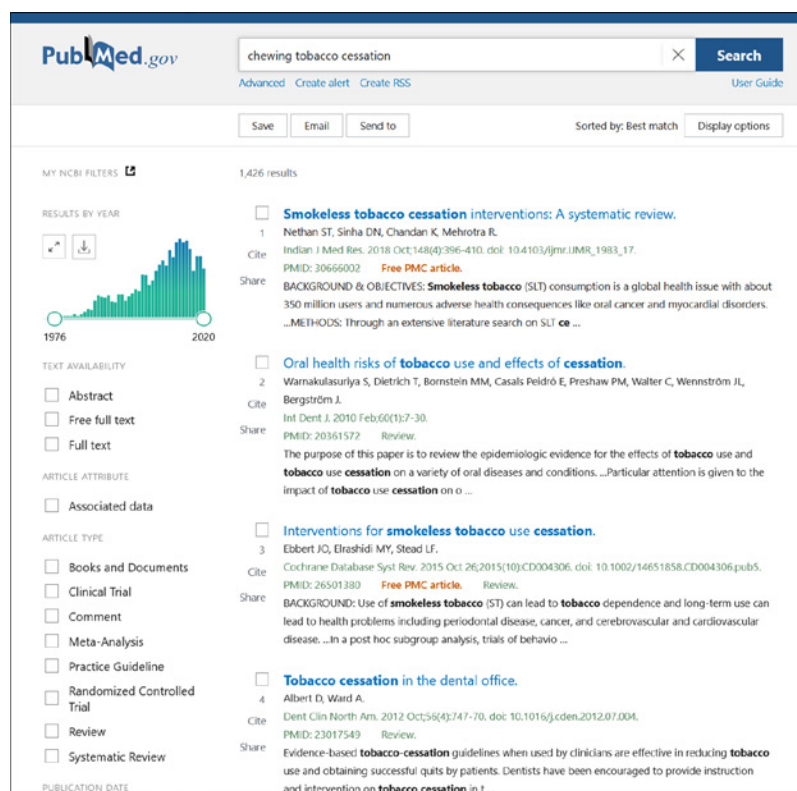


Figure 25b. Traditional PubMed Search for Chewing Tobacco Cessation.

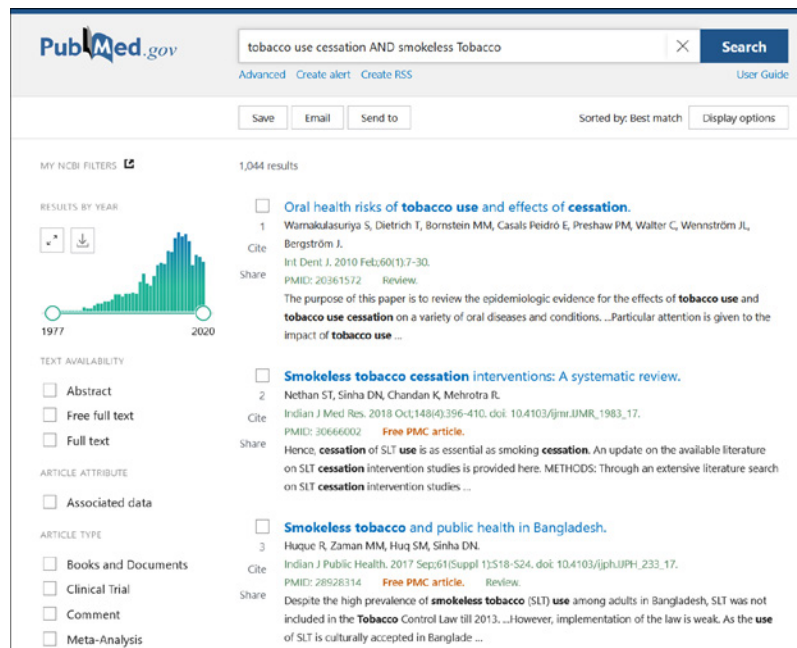


Figure 26a. Results of Limiting the 21,774 Citations for Tobacco Use Cessation AND Smokeless Tobacco to 1,044 Citations.



Figure 26b. Results of Limiting the 1,044 Citations for Tobacco Use Cessation AND Smokeless Tobacco to 1 Practice Guideline.

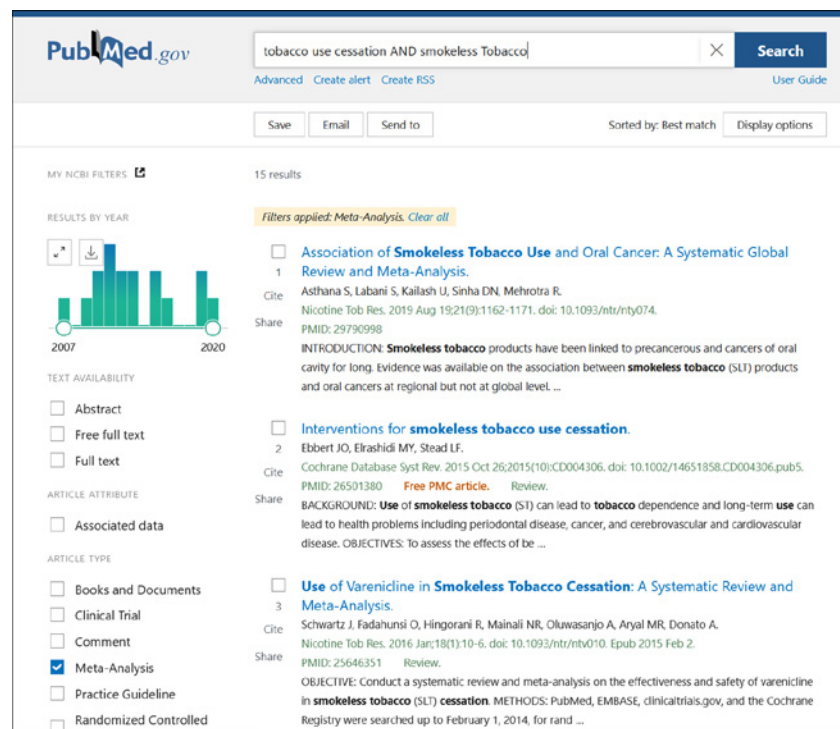


Figure 26c. Results of Limiting the 1,044 Citations for Tobacco Use Cessation AND Smokeless Tobacco to 1 Practice Guideline.

realistically, just look at the first 10 to 15 and hope that one answers the question. Fortunately, for those who are familiar with PubMed features, this process becomes easy to manage.

To narrow the search, add the search term smokeless tobacco using the AND Boolean operator. This limits the results to 1,044 citations (Figure 26a.) As previously illustrated, add the Practice Guidelines filter to Article Types so that you have the highest levels of evidence available

to start with. This results in 1 Practice Guideline, published in 2004 (Figure 26b). Subsequently, re-run the search by clicking on "Clear all" to remove the Practice Guideline filter and then click on Meta-Analysis. This results in 15, a reasonable starting point to determine if relevant information has been found (Figure 26c.). One of the top citations is the Cochrane 2015 review listed, as it was when conducting the Clinical Queries search (Figure 19).

Conclusion

Finding evidence to answer clinical questions requires skills that many professional programs are just now incorporating into curriculum. Although there is no one “correct” way to conduct a search, knowing how databases are designed and their key features allows you to be more efficient in quickly identifying relevant articles that can be used in clinical decision-making. The more successful you are, the more likely you will continue to search for the scientific evidence when it’s needed. PubMed offers two searching strategies, each of which can be conducted very efficiently if users take the time to learn how to use the Filters and Advanced Search features. With the development of evidence-based searching algorithms, the PubMed Clinical Queries feature is the preferred strategy in that it uses a streamlined searching mechanism that eliminates or reduces the need for multiple steps. In both case scenarios, relevant citations were found in 1-2 steps using the Clinical Queries feature vs. 5-7 steps using the PubMed comprehensive search strategy. Also, in each scenario, a more manageable number of clinically relevant and higher level

evidence citations were identified more quickly using Clinical Queries. This is a significant consideration in that individuals with limited experience using PubMed can be successful in finding useful information as they develop or refine their searching skills.

Just as in learning any skill, practice in conducting searches is needed. Again, one suggestion to gain hands-on experience is to follow the case scenarios in this course by opening a second window in your browser and doing each step as you read about it in the course. Another suggestion is to print out the pdf file of the course and use it as a guide after completing the course.

To gain a more in depth understanding of PubMed, access their tutorials at PubMed Online Training, <https://learn.nlm.nih.gov/documentation/training-packets/T0042010P/>. These include Quick Tours, which are brief animated tutorials with audio and cover a wide range of topics. Also, several areas have YouTube videos demonstrating different features, such as using the Advance search

Course Test Preview

To receive Continuing Education credit for this course, you must complete the online test. Please go to: www.dentalcare.com/en-us/professional-education/ce-courses/ce340/test

- 1. Which 2 PICO components provide the primary searching terms?**
 - A. Problem and Outcome
 - B. Intervention and Comparison
 - C. Intervention and Outcome
 - D. Comparison and Outcome
 - E. Problem and Intervention.
- 2. Which best describes PubMed?**
 - A. A web based retrieval system part of the National Library of Medicine.
 - B. Provides free access to MEDLINE, the premiere scientific database.
 - C. Provides links to articles and other resources.
 - D. Includes over 50 million citations from MEDLINE.
 - E. A, B & C.
- 3. What area of the PubMed Homepage is used to initiate a comprehensive search?**
 - A. Search Box
 - B. Feature Tabs
 - C. MeSH Database
 - D. Side Bar Links
 - E. Tutorials
- 4. Which of the following tools is used to identify the PubMed indexing language?**
 - A. Boolean Operators
 - B. Limits
 - C. Clinical Queries
 - D. MeSH Database
 - E. History
- 5. What is the primary purpose of Boolean Operators?**
 - A. To make sure the largest number of results is identified.
 - B. To make sure the least number of results is identified.
 - C. To limit results of a search by combining terms or concepts.
 - D. A and B.
 - E. B and C.
- 6. Which Boolean Operator is used to exclude terms from a search?**
 - A. not
 - B. or
 - C. and
 - D. never
 - E. A and B.
- 7. Which Boolean Operator is used to include both terms in the search?**
 - A. not
 - B. or
 - C. and
 - D. never
 - E. B and C.

8. **Which Boolean Operator is used to include at least one of two terms in a search?**
- A. not
 - B. or
 - C. and
 - D. never
 - E. A and D.
9. **All of the following characteristics describe the Search History Feature except:**
- A. Allows you to view all the search queries and results.
 - B. Allows you to combine previous search queries.
 - C. Does not require you to capitalize Boolean operators.
 - D. Requires you to write out search terms.
 - E. Requires using the # sign when combining searches.
10. **Which PubMed feature allows you to limit the citations according to study type?**
- A. Filters
 - B. Preview/Index
 - C. History
 - D. Clipboard
 - E. Details
11. **Which Filter option(s) are used to limit citations to find the highest level of evidence?**
- A. Languages
 - B. Species
 - C. Article Types
 - D. A and B
 - E. B and C
12. **Which PubMed feature is used to identify search terms when the original term does not yield enough results?**
- A. Boolean Operators
 - B. Filters
 - C. Clinical Queries
 - D. History
 - E. MeSH Database
13. **Which of the following Clinical Studies Categories on the PubMed Clinical Queries page is the default category?**
- A. Clinical Prediction Guides
 - B. Diagnosis
 - C. Etiology
 - D. Prognosis
 - E. Therapy
14. **Which of the PubMed Clinical Queries options finds citations for individual randomized controlled trials?**
- A. Clinical Study Categories: Therapy and Broad scope
 - B. Clinical Study Categories: Therapy and Narrow scope
 - C. Systematic Reviews.
 - D. COVID-19 Articles.
 - E. A and B

- 15. Which of the following Clinical Studies Categories on the PubMed Clinical Queries page is the default Scope?**
- A. Broad scope
 - B. Narrow scope
 - C. A and B are equal in scope
 - D. A and B
- 16. In question #15, if too many citations are found, which Clinical Queries option should be used next?**
- A. Broad scope
 - B. Narrow scope
 - C. Article types
 - D. Languages
 - E. Species
- 17. The Filters feature can be used with both a Clinical Queries and a comprehensive PubMed Search.**
- A. True
 - B. False
- 18. You are using the Article Type filter and have not found any Practice Guidelines. Which Article Type will provide you with the next highest level of evidence?**
- A. Books and Documents
 - B. Clinical Trial
 - C. Cohort Study
 - D. Meta-Analysis
 - E. Randomized Controlled Trial
- 19. Boolean Operators only can be used with a comprehensive PubMed Search.**
- A. True
 - B. False
- 20. The History feature does not reflect searches using Clinical Queries unless “See all” is used to view those results and apply additional filters.**
- A. True
 - B. False

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Syrene has presented at national and international dental, dental hygiene and allied health conferences on Evidence Based Decision Making including as a faculty member in the pre-Conference workshop for the 1st International Conference on Evidence-Based Dentistry. Syrene is the co-author with Jane Forrest on EBDM journal publications and on textbook chapters, the last 4 editions of *Clinical Periodontology* (Newman, Takei and Carranza editors), the current editions of *Dental Hygiene Theory and Practice* (Darby & Walsh; and Bowen & Pieren editors). Ms. Miller also is the co-author of the new textbook, *Evidence-Based Decision Making: A Translational Guide for Dental Professionals*.

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