

# Quality Resources for Clinical Decision-Making: Part 1. Trip Database and PubMed Clinical Queries

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This article is the first in a four-part series designed to help readers build skills in finding scientific evidence and understanding how to use evidence-based knowledge to support decisions in clinical practice. This first paper explains how to use two quality resources, the Trip Database and the Clinical Queries feature in PubMed, to answer patients' questions. A case scenario is provided to explain how to use each resource, and figures illustrate each step in the search process. The paper concludes with a clinical decision based on the scientific evidence discovered. *Int J Evid Based Pract Dent Hygienist 2016;2:11–16. doi: 10.11607/ebh.51*

**Keywords:** clinical decision-making, levels of evidence, PubMed Clinical Queries, secondary evidence, Trip database

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Patients view their dental hygienist as a resource when they have questions about their oral health. They may see a story on the news or read an article in a magazine and have questions about the validity of that information. We are a valuable resource and our patients trust us to provide accurate answers that are current and evidence-based. But we do not know the answer to every question—so what do we do when inquiring minds want to know? Where do we find scientific evidence written in a manner that we understand and can translate for our patients?

## Case scenario

Your patient has been a cigarette smoker for over 10 years and has a clinical presentation of nicotine stomatitis. You have counseled this patient that he is at risk for oral cancer and lung cancer, and have recommended a smoking cessation program. The patient reports that he has attempted to quit smoking on several occasions but has not been successful. Recently he has seen people using e-cigarettes and asks if using them would be an effective way to stop smoking. Although you've skimmed through some articles, you want to make sure you are familiar with the most current information and decide to investigate further.

To begin with, you Google e-cigarettes and get 20,800,000 hits in 0.45 seconds. Wow! That's an overwhelming amount to review once you scan past the map of where to purchase the devices (Fig 1). Where do you begin and how do you know which pages will provide you with credible information? As you scroll down, you find Wikipedia and WebMD, both websites that can provide some background information but may not answer your specific question. Furthermore, the information on these sites is not always scientifically accurate.



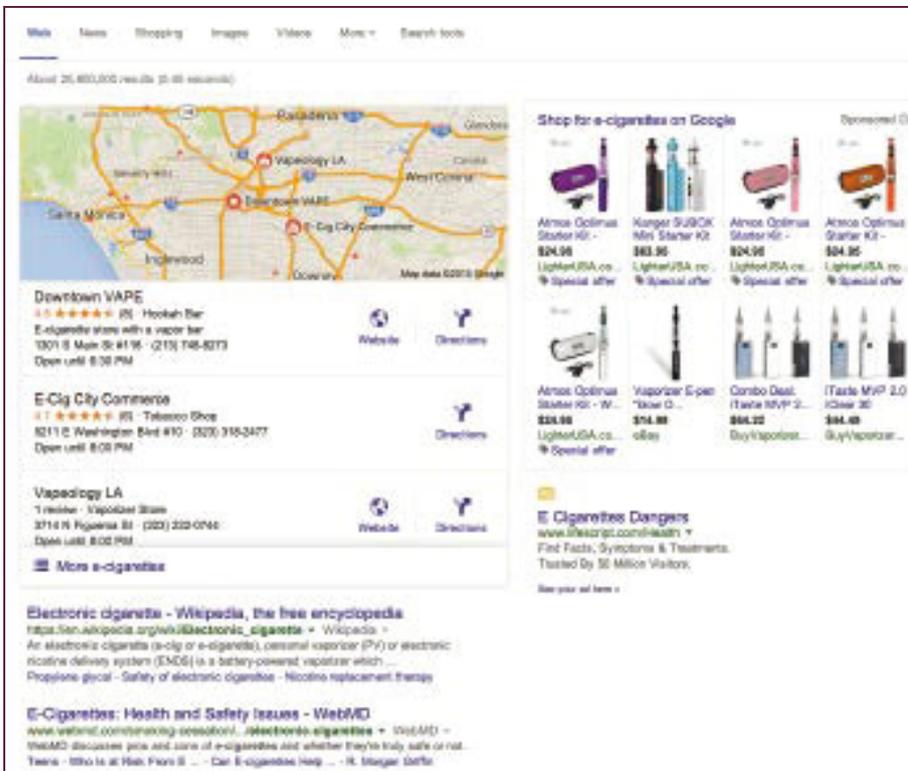


Fig 1 Google search.

Even though your first inclination may be to use Google, this search engine may not be your best, most efficient go-to resource for scientific information. So what other resources are available to help you answer this important question? Two credible options that will provide you with the highest level of scientific evidence are the Trip Database ([www.trip-database.com](http://www.trip-database.com)) and the Clinical Queries feature in PubMed (<http://www.ncbi.nlm.nih.gov/pubmed/> or just [www.pubmed.gov](http://www.pubmed.gov)). Let's explore each database to learn how to quickly find information from these sites to answer your clinical questions.

For our e-cigarette scenario, let's start with the Trip (translating research into practice) Database. Enter e-cigarettes in the search box and click "Search" (Fig 2). Over 570,000 results are shown (Fig 3); however, unlike Google, these results can be sorted by level of evidence so that the references are listed in order of highest-quality research. Refining your search is easily accomplished. On the top right side of the screen, click on the box "All Secondary Evidence" (Fig 3). Secondary sources provide the highest level of evidence since they synthesize individual primary studies that answer the same question, providing you with a body of evidence rather than an individual research study. You will see that All Secondary Evidence is color-coded in green. In addition, the small triangle shows where the reference falls on the hierarchy of evidence (Fig 4). Scrolling down the first page of this site, you can see that there are several articles that may be able to answer your question. You can click on the title and scan the abstract to determine if it addresses the question you are trying to answer.

Useful types of secondary evidence to look for in your search are clinical practice guidelines, summaries of systematic reviews, and then systematic reviews. In this search, we found all three categories of secondary evidence. A specific summary of interest found was "Electronic cigarettes: A review of the clinical evidence and safety."<sup>1</sup> This synopsis specifically addresses your research question (What is the clinical evidence regarding the utility of electronic cigarettes for smoking cessation?) and also raises a second question: What is the clinical evidence regarding the safety and potential harms associated with electronic cigarettes and the associated cartridges?

The authors concluded in a section called "Key Message" that e-cigarette use can reduce the desire to smoke; however, it is important to recognize that long-term studies on the efficacy of e-cigarettes for permanent cessation and their safety have yet to be conducted, as they have not been available for an extended period of time.

The second resource is PubMed, specifically the Clinical Queries feature (Fig 5). This feature automatically uses an evidence-based approach to search for the highest levels of evidence (Fig 6). When you type "e-cigarettes and smoking cessation" in the search box, look under the middle column titled "Systematic Reviews"—you will see that 45 citations are identified (Fig 7). That is significantly less than the 20+ million we started with in our Google search! On this page, the first five references are listed; if one of the five does not appear to answer your question(s), then click on "See All (45)" to view all of the citations. In doing so, we can scroll

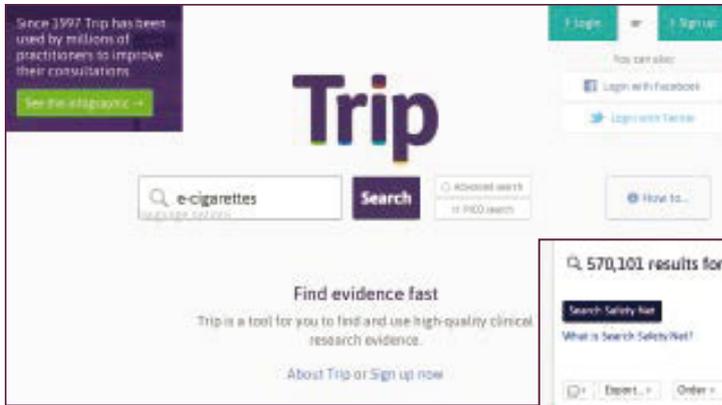


Fig 2 Trip Database.

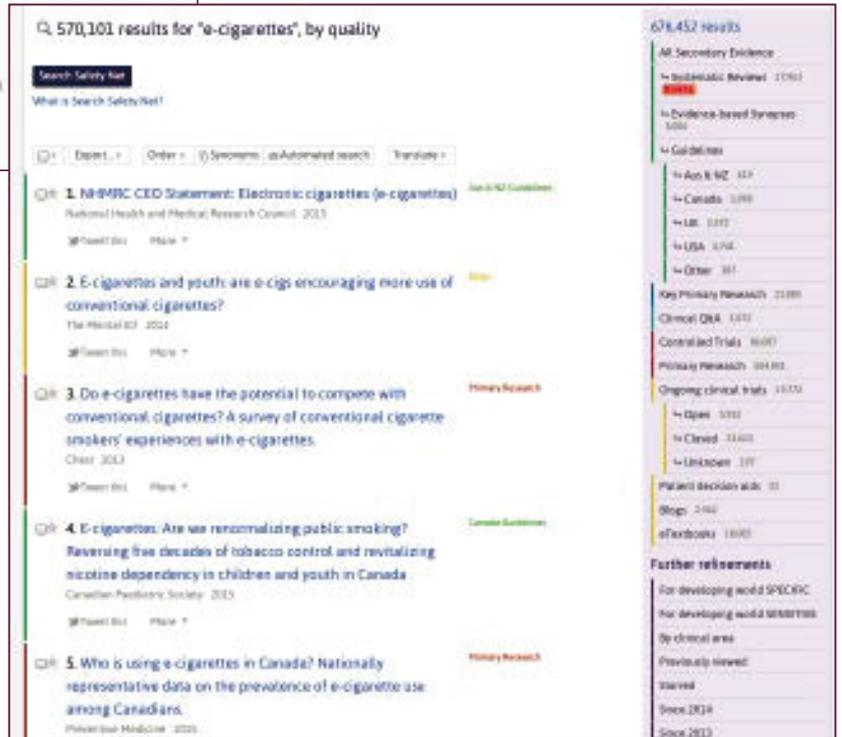


Fig 3 Trip Database search results.

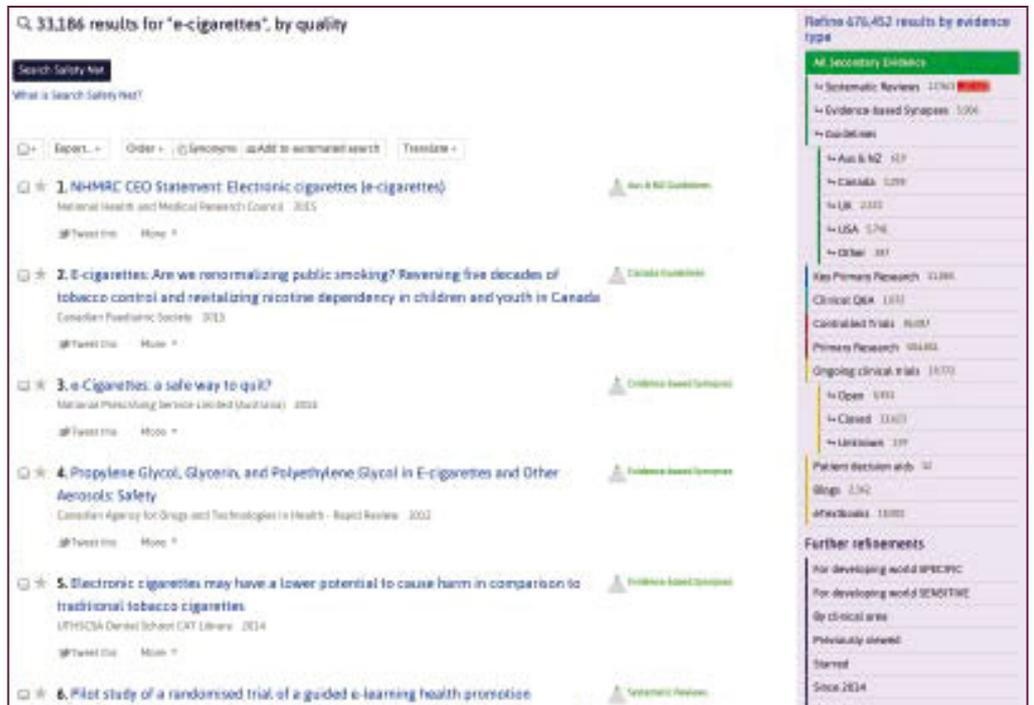


Fig 4 Small triangles show hierarchy of evidence in Trip Database search results.

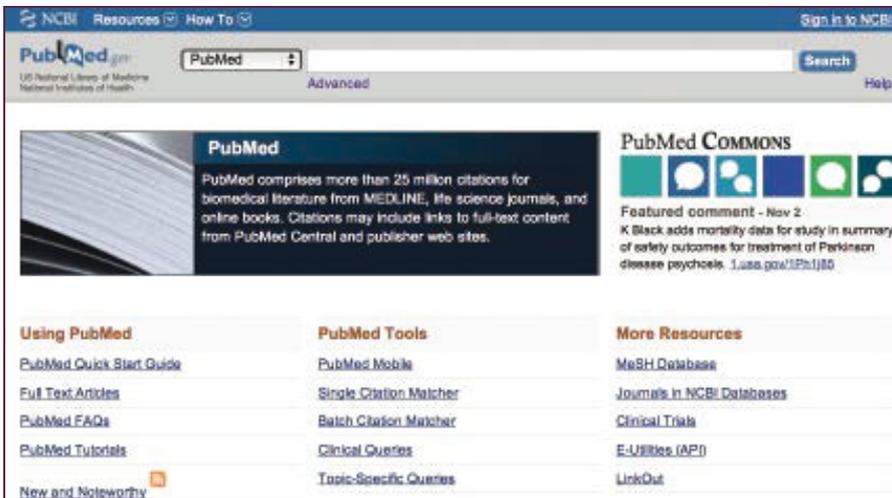


Fig 5 PubMed homepage.

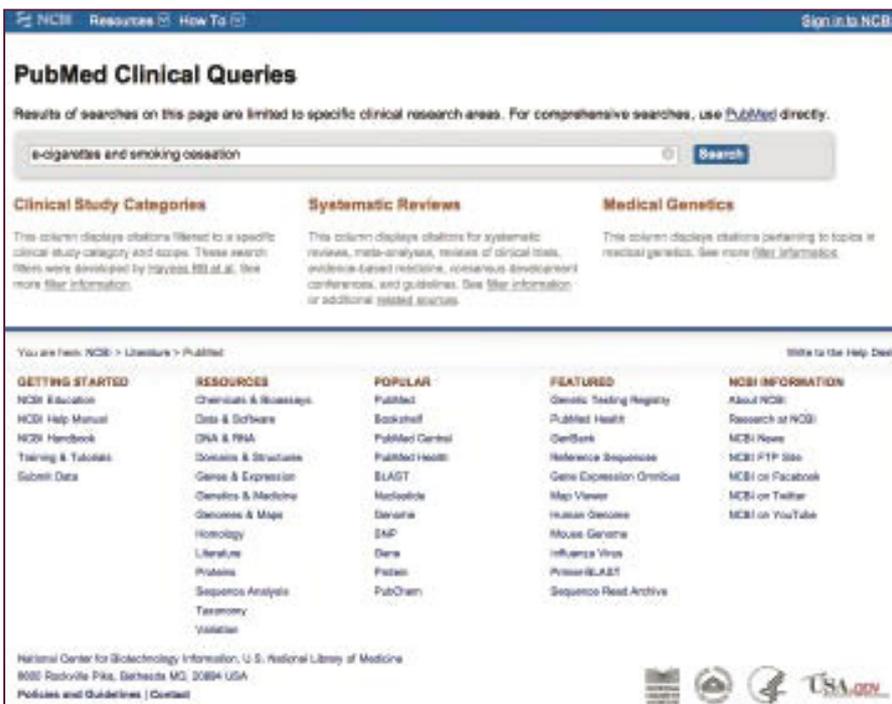


Fig 6 PubMed Clinical Queries uses an evidence-based approach to search for the highest levels of evidence.

down to reference 13: “Electronic cigarettes for smoking cessation and reduction: Evidence from a systematic review and meta-analysis”<sup>2</sup> (Fig 8). Clicking on that citation shows the article abstract and indicates that the complete article is available free (Fig 9). Review of the paper shows that the use of e-cigarettes is “associated with smoking cessation and reduction,” but the authors note that more studies are needed to assess the effectiveness of e-cigarettes in comparison with other methods for smoking cessation. Again, because e-cigarettes are relatively new, we simply do not have all the answers about their effectiveness for smoking cessation.

In both searches we found systematic reviews indicating the same results. The beauty of finding a systematic review is that it synthesizes information from two or more studies that address the same question, saving you time in having to read, interpret, and synthesize multiple individual studies. When you find a summary of a systematic review, you are getting a condensed version that provides a critical analysis of how well the study was conducted, as well as a critique of the evidence and the clinical application.

Now that you have your answer about the effectiveness of e-cigarettes for smoking cessation, you meet with your patient and he is appreciative of the research you have provided. He then asks you if it is safe to use e-cigarettes to quit smoking. Although this second question was not part of your original search, you remember that it was addressed in the reference you found when searching the Trip Database—“Electronic cigarettes: A review of the clinical evidence and safety.”<sup>1</sup> However, since you are now searching PubMed and because you are so savvy, you immediately go back to Clinical Queries, since it can quickly help you find any practice guidelines related to safety. Conducting a search of e-cigarette safety reveals 20 references under the “Systematic Reviews” column (Fig 10), 3 of which are practice guidelines (sometimes referred to as position statements) providing the highest level of evidence. One is from the Forum of International Respiratory Societies,<sup>3</sup> the second from the Spanish Society of Pneumology and Thoracic Surgery (SEPAR),<sup>4</sup> and the third from the Tobacco Control Department of the International Union Against Tuberculosis and

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

Search: e-cigarettes and smoking cessation

**Clinical Study Categories**  
Category: Therapy  
Scope: Broad

**Systematic Reviews**  
Results: 5 of 45

**Medical Genetics**  
Topic: All

Results: 5 of 343

Results: 5 of 45

Results: 5 of 5

Fig 7 (above) PubMed Clinical Queries search results.

**Search results**  
Items: 1 to 20 of 45

1. Behavioral Counseling and Pharmacotherapy Interventions for Tobacco Cessation in Adults, Including Pregnant Women: A Review of Reviews for the U.S. Preventive Services Task Force (Internet).  
Patnode CD, Henderson JT, Thompson JH, Senger CA, Fortmann SP, Whitlock EP, Rodwin MD. Agency for Healthcare Research and Quality (US); 2015 Sep.

11. A critical review of smoking cessation, relapse and emerging research in pregnancy and postpartum.  
Meernik C, Goldstein AC.  
BMC Med. 2015 Jun 11;13:46. doi: 10.1093/bmb/018. Epub 2015 Apr 29.  
PMID: 25920615  
S0163-0809

12. Electronic nicotine delivery devices, and their impact on health and patterns of tobacco use: a systematic review protocol.  
Glasser AM, Cobb CO, Tepitskaya L, Ganz O, Katz L, Rose SW, Feirman S, Villani AC.  
BMJ Open. 2015 Apr 29;9(4):e007688. doi: 10.1136/bmjopen-2015-007688. Review.  
PMID: 25920149 Free PMC Article  
S0959-5628

13. E-cigarettes and smoking cessation: evidence from a systematic review and meta-analysis.  
Rahman MA, Hann N, Wilson A, Mrazek-Ganani G, Worral-Carter L.  
PLoS One. 2015 Mar 30;10(3):e0122644. doi: 10.1371/journal.pone.0122644. eCollection 2015.  
PMID: 25822251 Free PMC Article  
S0163-0809

Fig 8 (right) Reference 13 is a systematic review on the subject of e-cigarettes for smoking cessation.

Fig 9 (below) Clicking on reference 13 brings up the article abstract.

**Abstract**

Full Text: 2015 Mar 30;10(3):e0122644. doi: 10.1371/journal.pone.0122644. eCollection 2015.

**E-cigarettes and smoking cessation: evidence from a systematic review and meta-analysis.**  
Rahman MA<sup>1</sup>, Hann N<sup>2</sup>, Wilson A<sup>2</sup>, Mrazek-Ganani G<sup>4</sup>, Worral-Carter L<sup>5</sup>.

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**Abstract**  
**BACKGROUND:** E-cigarettes are currently being debated regarding their possible role in smoking cessation and as they are becoming increasingly popular, the research to date requires investigation.  
**OBJECTIVES:** To investigate whether the use of e-cigarettes is associated with smoking cessation or reduction, and whether there is any difference in efficacy of e-cigarettes with and without nicotine on smoking cessation.  
**DATA SOURCES:** A systematic review of articles with no limit on publication date was conducted by searching PubMed, Web of Knowledge and Scopus databases.  
**METHODS:** Published studies, those reported smoking abstinence or reduction in cigarette consumption after the use of e-cigarettes, were included. Studies were systematically reviewed, and meta-analyses were conducted using Mantel-Haenszel fixed-effect and random-effects models. Degree of heterogeneity among studies and quality of the selected studies were evaluated.  
**RESULTS:** Six studies were included involving 7,651 participants. Meta-analyses included 1,242 participants who had complete data on smoking cessation. Nicotine filled e-cigarettes were more effective for cessation than those without nicotine (pooled Risk Ratio 2.23, 95%CI 1.05-4.87). Amongst 1,242 smokers, 224 (18%) reported smoking cessation after using nicotine-entriched e-cigarettes for a minimum period of six months. Use of such e-cigarettes was positively associated with smoking cessation with a pooled Effect Size of 0.20 (95%CI 0.11-0.28). Use of e-cigarettes was also associated with a reduction in the number of cigarettes used.  
**LIMITATIONS:** Included studies were heterogeneous, due to different study designs and gender variation. Whilst we were able to comment on the efficacy of nicotine vs. non-nicotine e-cigarettes for smoking cessation, we were unable to comment on the efficacy of e-cigarettes vs. other interventions for cessation, given the lack of comparator groups in the studies included in this meta-analysis.  
**CONCLUSIONS:** Use of e-cigarettes is associated with smoking cessation and reduction. More randomised controlled trials are needed to assess effectiveness against other cessation methods.

PMID: 25822251 [PubMed - in process] PMID: 25822251 Free PMC Article

Lung Disease<sup>5</sup> (Fig 11). Interestingly, all three groups state that there is insufficient evidence to support the use of e-cigarettes in general and that they

should be restricted or banned until more information about their safety is available. Potential nicotine poisoning among young children was raised as an



Fig 10 Search result for e-cigarette safety.

Fig 11 (right) Three practice guidelines, which provide the highest level of evidence, are found.

issue by several groups.<sup>1,3-5</sup> The SEPAR and Forum of International Respiratory Societies called for e-cigarettes to be regulated as a medication<sup>3,4</sup> while they and others commented on the need to conduct methodologically sound research studies to reliably determine the long-term efficacy and safety of e-cigarettes, which is currently unknown.<sup>1-5</sup>

Given what we have learned from these searches, what do we tell our patient who would like to quit smoking? The first aspect is that we do have some limited information that suggests that e-cigarettes may be helpful in smoking cessation by reducing the desire to smoke; however, we do not have long-term studies that demonstrate effectiveness. More importantly, we have significant safety concerns that override any other issues regarding use. As health care providers, we have a responsibility to inform our patients that there are serious risks with the use of e-cigarettes just as with regular cigarettes, and that there are safer alternatives to be considered for smoking cessation.

## Acknowledgments

The author reports no conflicts of interest.

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3. Schraufnagel DE, Blas F, Drummond MB, et al. Electronic cigarettes. A position statement of the forum of international respiratory societies. *Am J Respir Crit Care Med* 2014;190:611-618.
4. Jimenez Ruiz A, Solano Reina S, de Granada Orive JI, et al. The electronic cigarette. Official statement of the Spanish Society of Pneumology and Thoracic Surgery (SEPAR) on the efficacy, safety and regulation of electronic cigarettes. *Arch Bronconeumol* 2014;50:362-367.
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