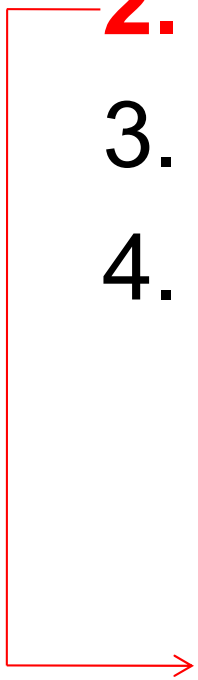
How to do literature search

Vo Tuan Khoa

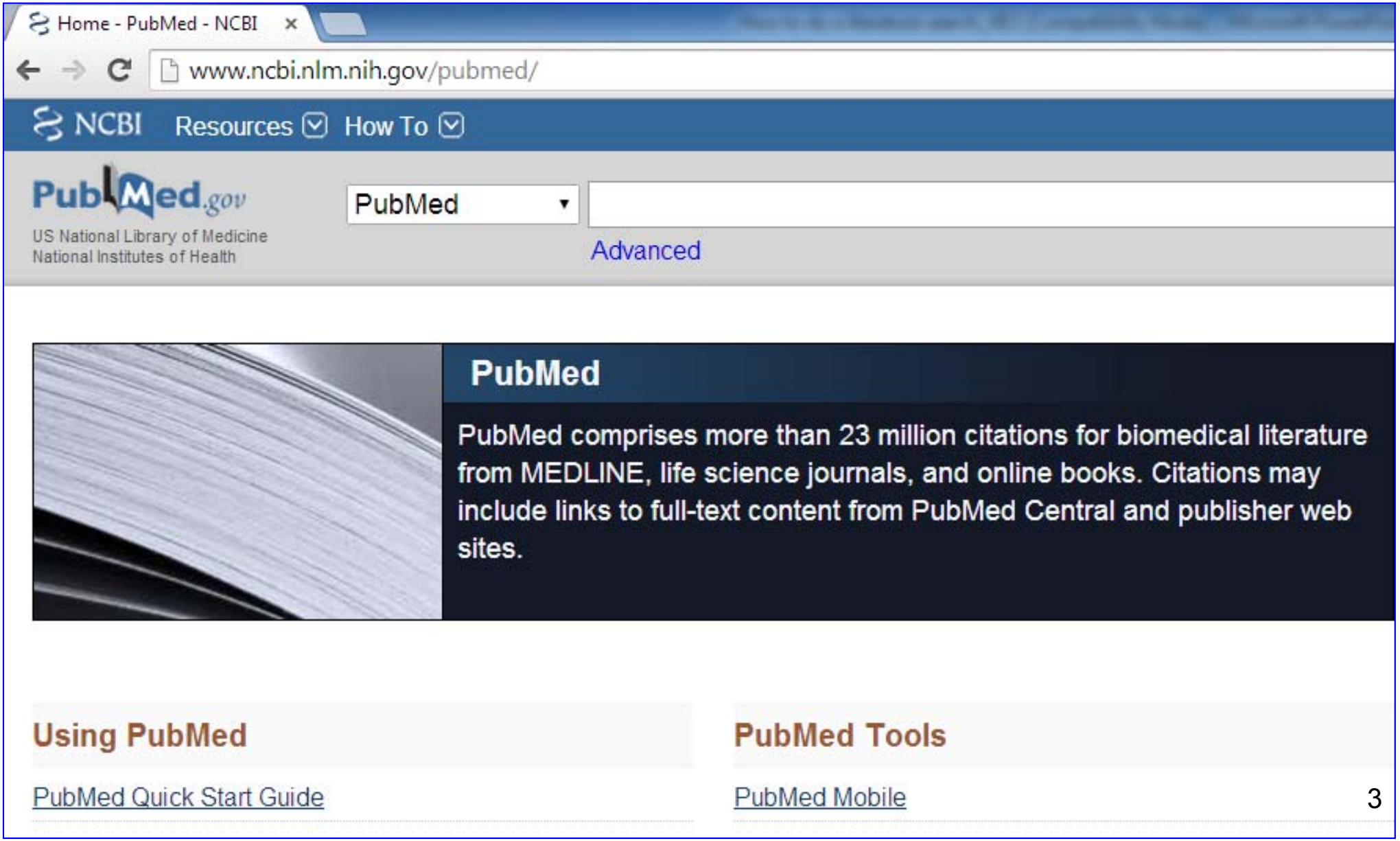
What is practice of EBM?

1. Develop a focused clinical question
2. **Search for the best evidence**
3. Critically appraise the evidence
4. Apply the evidence and evaluate the outcome



The electronic databases

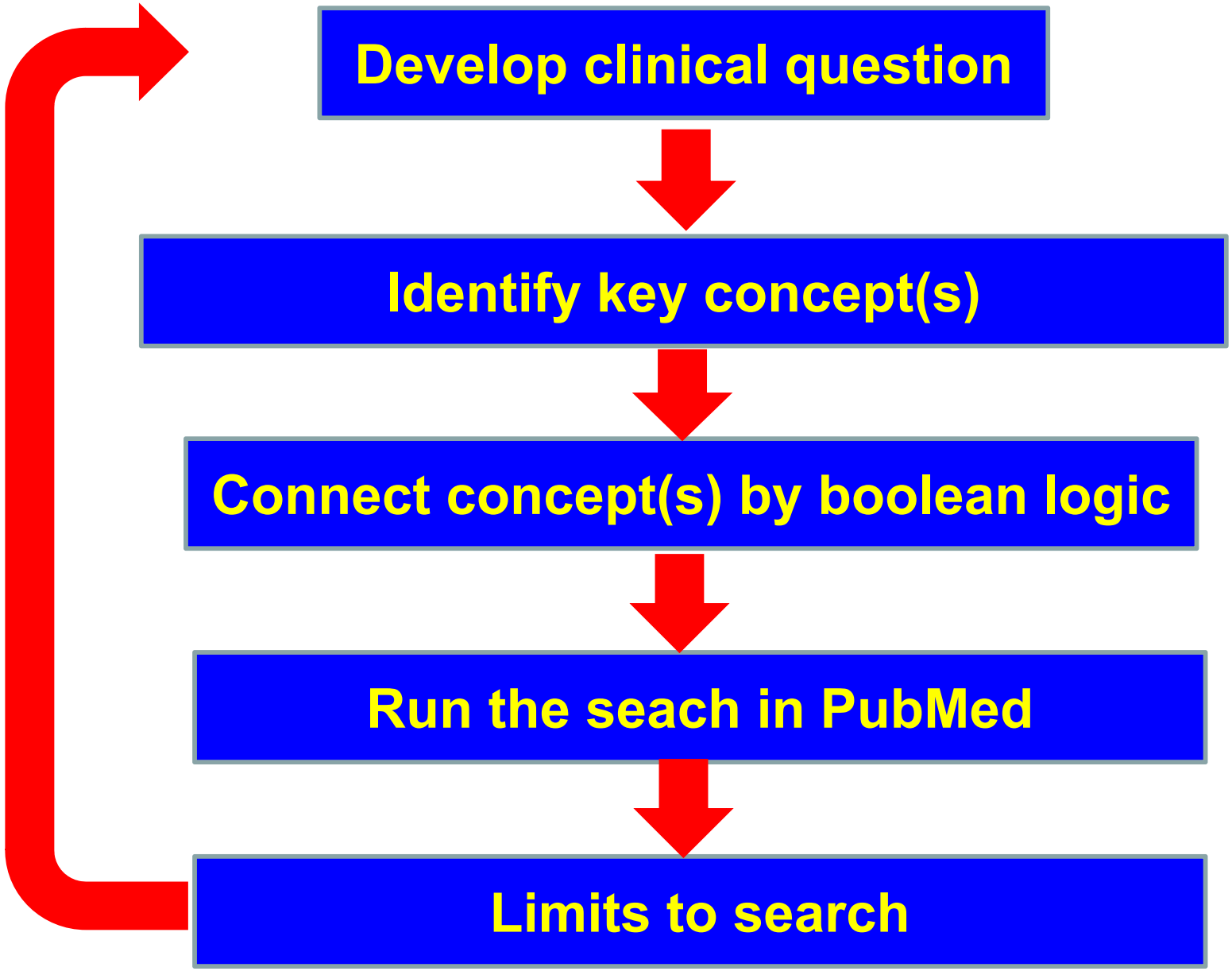
www.pubmed.com



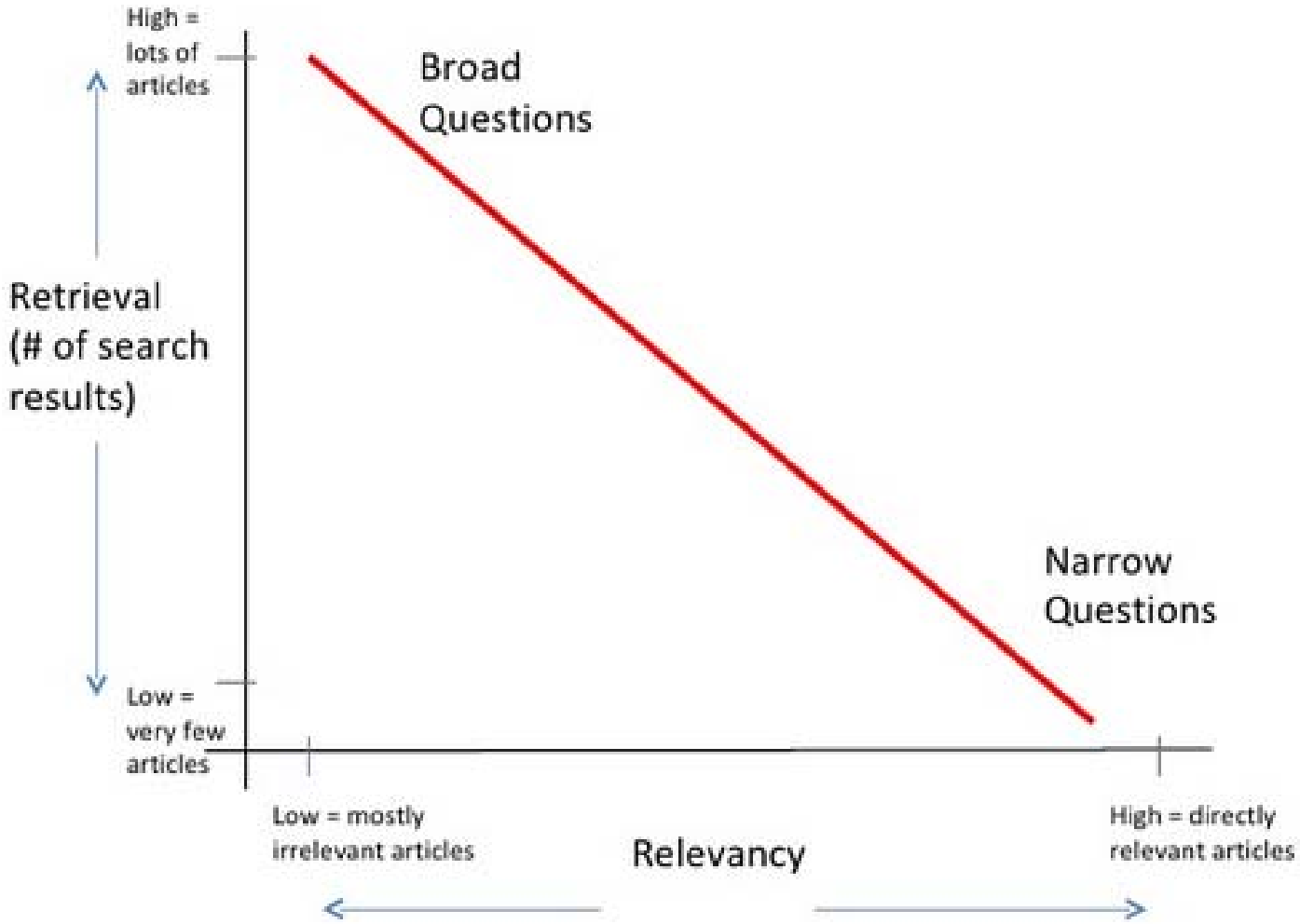
Pubmed database

- Developed by National Center for Biotechnology Information (NCBI) at National Library of Medicine (NLM)
- Included MedLine, Old MedLine (1951 to 1965), some non-MedLine journals; published before selection for MedLine indexing, and 'selectively indexed' MedLine
- Search engine: receive a search request → compare it with an index → return the corresponding results.

A search strategy



How questions influences the search results?



Robin Featherstone. How to Conduct a Systematic Search in PubMed
http://www.slideshare.net/featherr/how-to-conduct-a-systematic-search-in-pubmed

Possible question

Broad

- *What is the prevalence of sexual disorders in diabetes?*

Narrow

- *What is the risk of pancreas cancer for type 2 diabetes patients treated with DDP-IV inhibitors?*

Too narrow

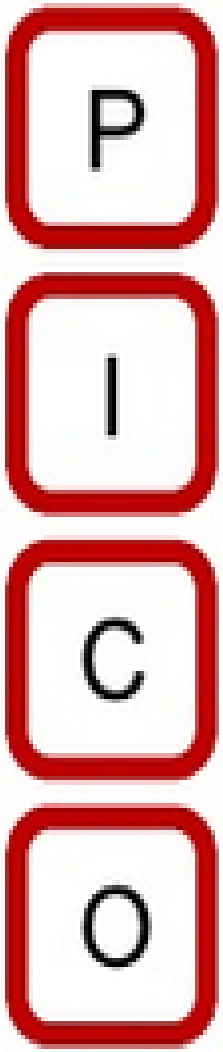
- *What is the rate of unintended pregnancy for working women in HCM City between 2000 and 2010?*

Key concept

- Medical term: high blood pressure → hypertension
- Acronym: MEN → Multiple Endocrine Neoplasm
- Variant: tumor or tumour
- PICO format
- MeSH (Medical Subject Headings) tools

Develop a PICO format

- Population/patients
- Intervention/exposure
- Comparison
- Outcome/endpoint



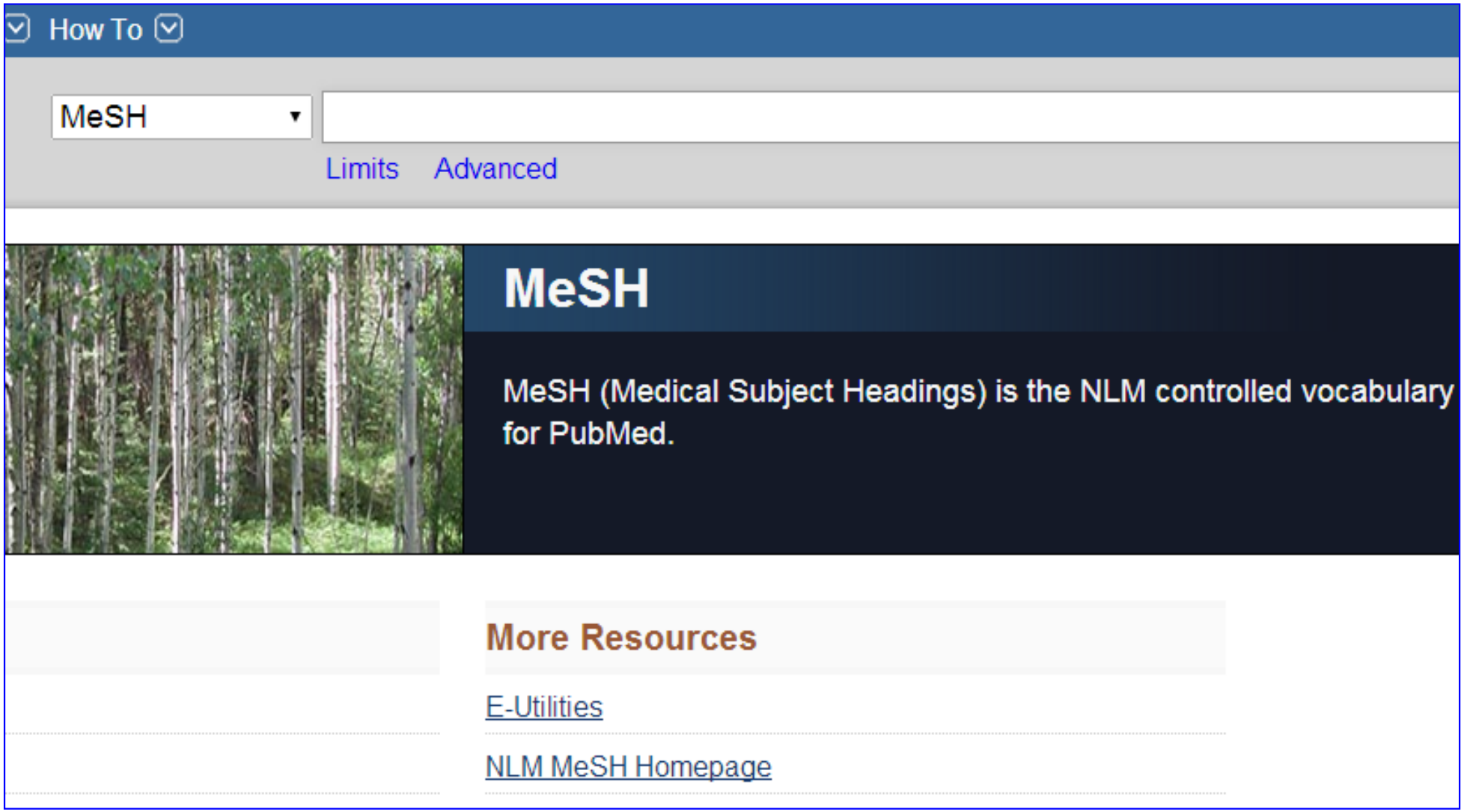
- Type 2 diabetes
- DPP-IV inhibitors
- (none)
- Pancreas cancer

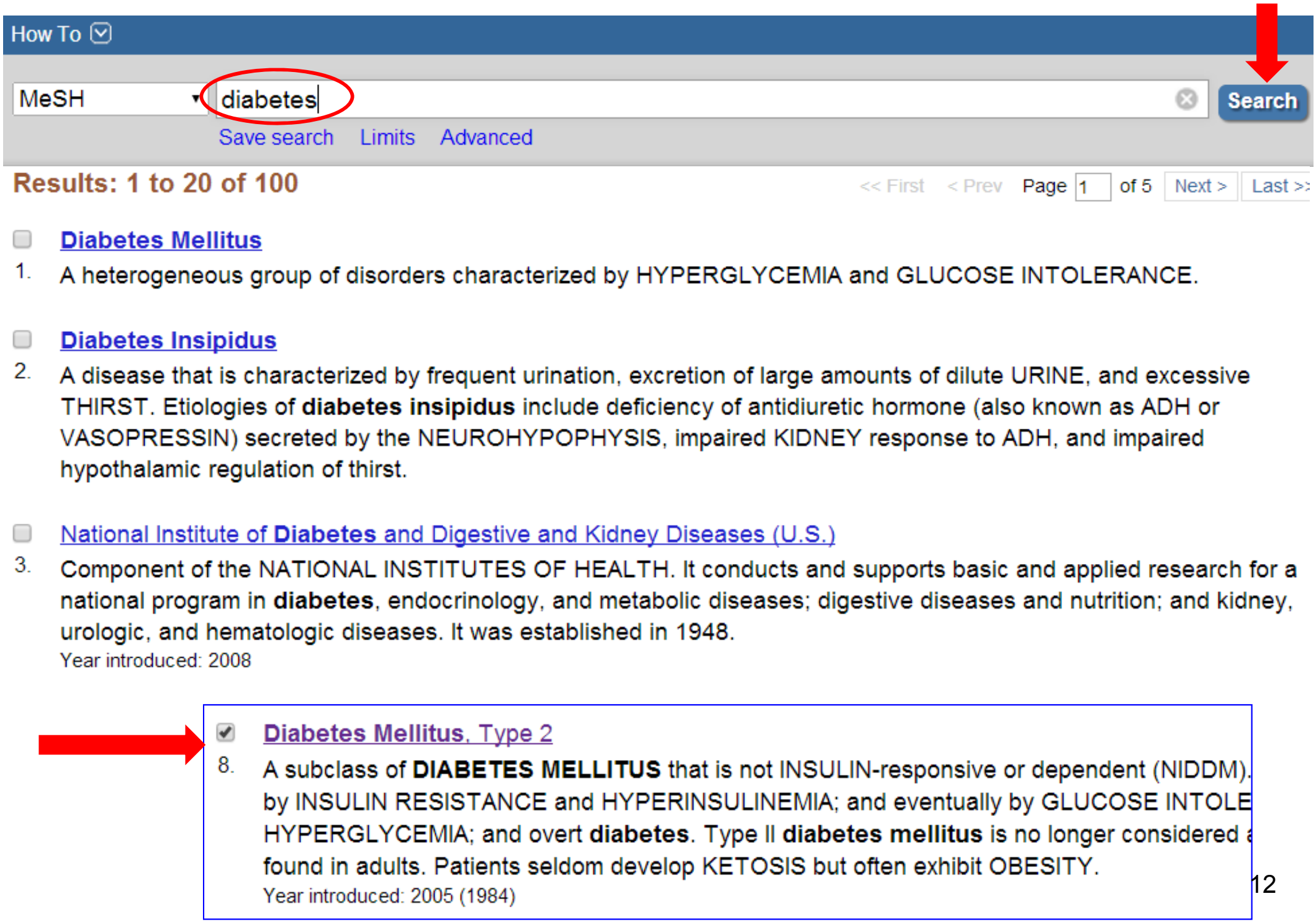
Identify MeSH for concept(s)

What is the MeSH for these concepts?

- Type 2 diabetes
- Dipeptyl-Peptidase IV inhibitors or incretin?
- Pancreas cancer or pancreatic cancer?

- On PubMed screen, select MeSH Database link




How To
MeSH
diabetes
Search
Save search
Limits
Advanced
Results: 1 to 20 of 100
<< First
< Prev
Page 1 of 5
Next >
Last >>
Diabetes Mellitus
1. A heterogeneous group of disorders characterized by HYPERGLYCEMIA and GLUCOSE INTOLERANCE.
Diabetes Insipidus
2. A disease that is characterized by frequent urination, excretion of large amounts of dilute URINE, and excessive THIRST. Etiologies of diabetes insipidus include deficiency of antidiuretic hormone (also known as ADH or VASOPRESSIN) secreted by the NEUROHYPOPHYSIS, impaired KIDNEY response to ADH, and impaired hypothalamic regulation of thirst.
National Institute of Diabetes and Digestive and Kidney Diseases (U.S.)
3. Component of the NATIONAL INSTITUTES OF HEALTH. It conducts and supports basic and applied research for a national program in diabetes, endocrinology, and metabolic diseases; digestive diseases and nutrition; and kidney, urologic, and hematologic diseases. It was established in 1948.
Year introduced: 2008
Diabetes Mellitus, Type 2
8. A subclass of DIABETES MELLITUS that is not INSULIN-responsive or dependent (NIDDM).
by INSULIN RESISTANCE and HYPERINSULINEMIA; and eventually by GLUCOSE INTOLE
HYPERGLYCEMIA; and overt diabetes. Type II diabetes mellitus is no longer considered
found in adults. Patients seldom develop KETOSIS but often exhibit OBESITY.
Year introduced: 2005 (1984)

Diabetes Mellitus, Type 2

A subclass of DIABETES MELLITUS that is not INSULIN-responsive or dependent (NIDDM). It is characterized initially by INSULIN RESISTANCE and HYPERINSULINEMIA; and eventually by GLUCOSE INTOLERANCE; HYPERGLYCEMIA; and overt diabetes. Type II diabetes mellitus is no longer considered a disease exclusively found in adults. Patients seldom develop KETOSIS but often exhibit OBESITY.
Year introduced: 2005 (1984)

PubMed search builder options

Subheadings:

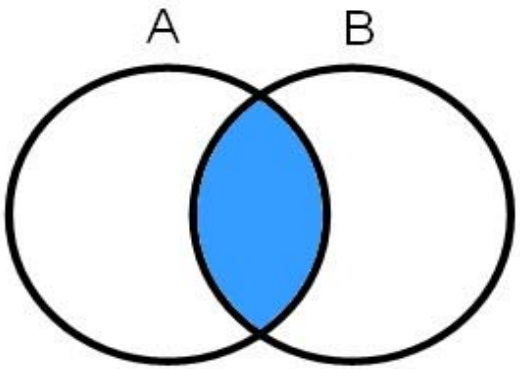
- ☐ analysis
- ☐ anatomy and histology
- ☐ blood
- ☐ cerebrospinal fluid
- ☐ chemically induced
- ☐ classification
- ☐ epidemiology
- ☐ ethnology
- ☐ etiology
- ☐ genetics
- ☐ history
- ☐ immunology
- ☐ prevention and control
- ☐ psychology
- ☐ radiography
- ☐ radionuclide imaging
- ☐ radiotherapy
- ☐ rehabilitation

- Rats, Inbred OLETF
- Metabolic Syndrome X

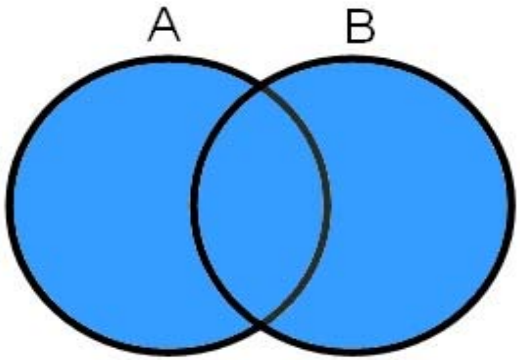
All MeSH Categories
Diseases Category
Nutritional and Metabolic Diseases
Metabolic Diseases
Glucose Metabolism Disorders
Diabetes Mellitus
Diabetes Mellitus, Type 2
Diabetes Mellitus, Lipoatrophic

All MeSH Categories
Diseases Category
Endocrine System Diseases
Diabetes Mellitus
Diabetes Mellitus, Type 2
Diabetes Mellitus, Lipoatrophic

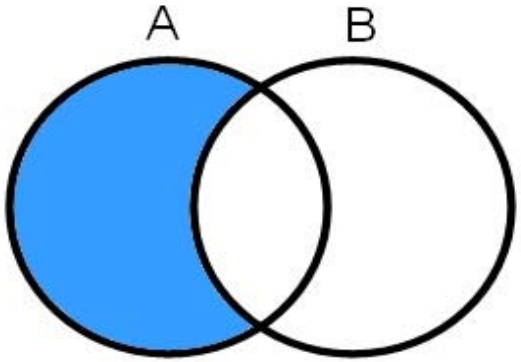
Boolean operators



A AND **B**



A OR **B**



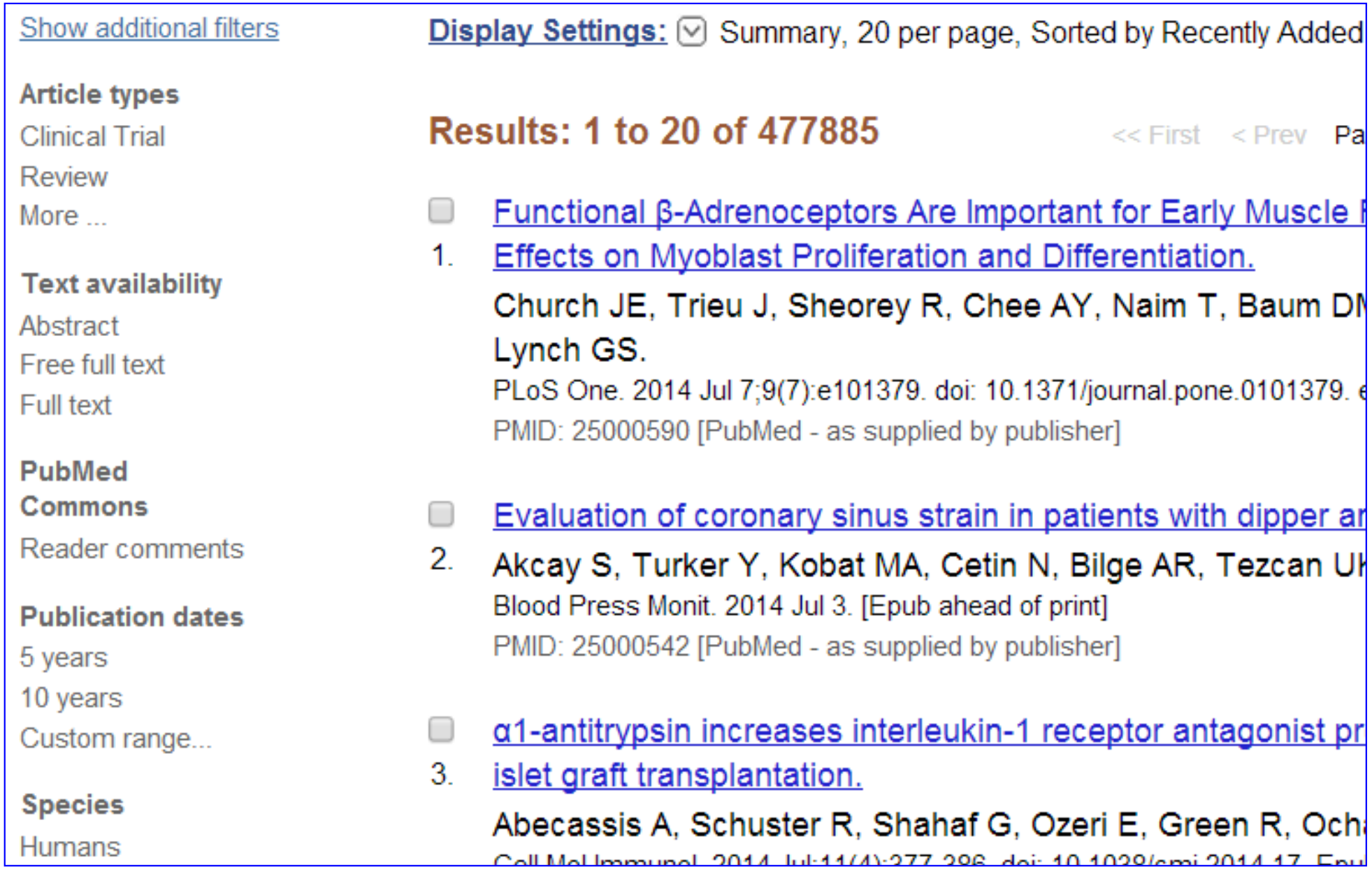
A NOT **B**

For PubMed search:

- Boolean connectors in a left-to-right sequence
- Must be entered in upper case

Limits to search

- Publication date: the last 5 years
- Types of article: clinical trial, meta-analysis, systematic review
- Language: english
- Species: human
- Sex: specify
- Age: children or adult
- Field tags: title



Show additional filters

Article types
Clinical Trial
Review
More ...

Text availability
Abstract
Free full text
Full text

PubMed Commons
Reader comments

Publication dates
5 years
10 years
Custom range...

Species
Humans

Display Settings: Summary, 20 per page, Sorted by Recently Added

Results: 1 to 20 of 477885 << First < Prev Pa

Functional β-Adrenoceptors Are Important for Early Muscle
1. Effects on Myoblast Proliferation and Differentiation.

Church JE, Trieu J, Sheorey R, Chee AY, Naim T, Baum DM
Lynch GS.

PLoS One. 2014 Jul 7;9(7):e101379. doi: 10.1371/journal.pone.0101379. e
PMID: 25000590 [PubMed - as supplied by publisher]

Evaluation of coronary sinus strain in patients with dipper ar
2. Akcay S, Turker Y, Kobat MA, Cetin N, Bilge AR, Tezcan UK

Blood Press Monit. 2014 Jul 3. [Epub ahead of print]
PMID: 25000542 [PubMed - as supplied by publisher]

α1-antitrypsin increases interleukin-1 receptor antagonist pr
3. islet graft transplantation.

Abecassis A, Schuster R, Shahaf G, Ozeri E, Green R, Ocha

Clinical scenario

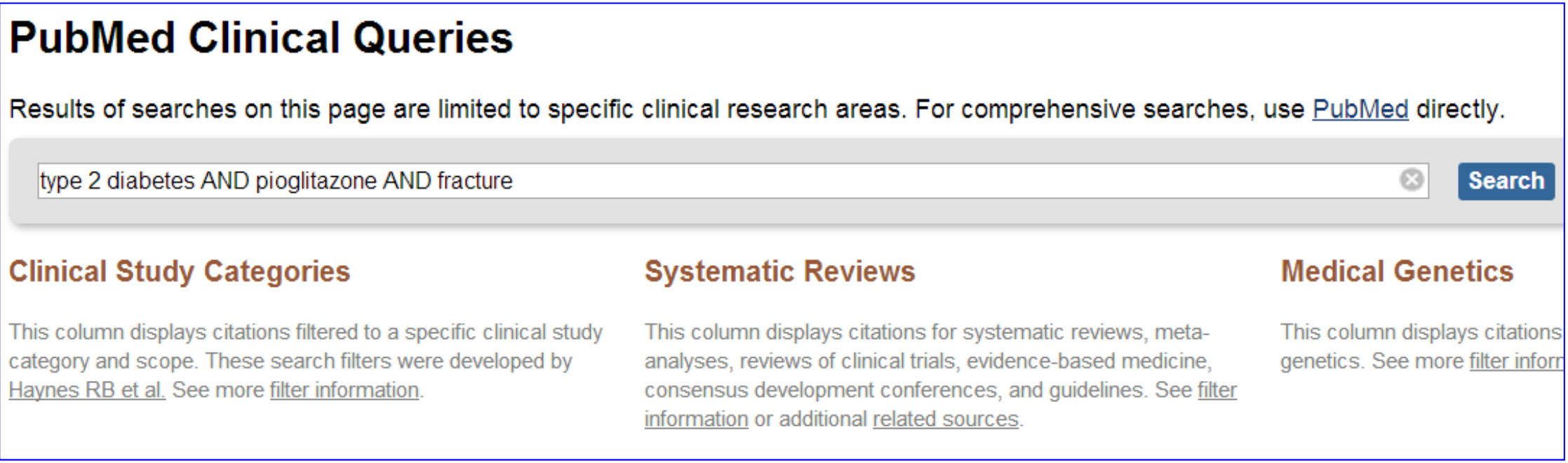
- A 60 year-old female had type 2 diabetes for two years. She was treated with metformin and pioglitazone.
- Recently, she heard that pioglitazone treatment is associated with (hip) fracture
- What do you do?

How to run a search in PubMed

- Clinical queries
- MeSH tools
- PICO tools

How to use **Clinical Queries**

1. www.pubmed.com, click on Clinical Queries link
2. Type key words on search engine



Results

Clinical Study Categories

Category: Therapy

Scope: Broad

Results: 5 of 43

The skeletal effects of pioglitazone in type 2 diabetes or impaired glucose tolerance: a randomized controlled trial.

Grey A, Bolland M, Fenwick S, Horne A, Gamble G, Drury PL, Reid IR.

Eur J Endocrinol. 2014 Feb; 170(2):255-62. Epub 2013 Dec 21.

Effects of pioglitazone on bone in postmenopausal women with impaired fasting glucose or impaired glucose tolerance: a randomized, double-blind, placebo-controlled study.

Bone HG, Lindsay R, McClung MR, Perez AT, Raanan MG, Spanheimer RG.

J Clin Endocrinol Metab. 2013 Dec; 98(12):4691-701. Epub 2013 Sep 20.

Comparing pioglitazone to insulin with respect to cancer, cardiovascular and bone fracture endpoints, using propensity score weights.

Systematic Reviews

Results: 5 of 7

AHRQ's comparative effectiveness research on oral medications for type 2 diabetes: a summary of the key findings.

Bennett WL, Balfe LM, Faysal JM.

J Manag Care Pharm. 2012 Jan-Feb; 18(1 Suppl A):1-22.

Comparative effectiveness and safety of medications for type 2 diabetes: an update including new drugs and 2-drug combinations.

Bennett WL, Maruthur NM, Singh S, Segal JB, Wilson LM, Chatterjee R, Marinopoulos SS, Puhan MA, Ranasinghe P, Block L, et al.

Ann Intern Med. 2011 May 3; 154(9):602-13. Epub 2011 Mar 14.

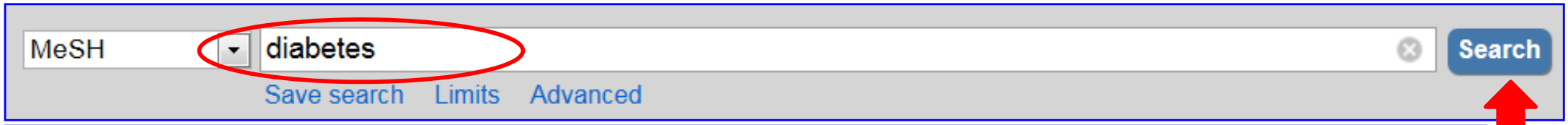
Thiazolidinediones and fractures: evidence from translating research into action for diabetes.

Bilik D, McEwen LN, Brown MB, Pomeroy NE, Kim C, Asao K, Crosson JC, Duru OK, Ferrara A, Hsiao VC, et al.

How to use **MeSH tools**

Setting MeSH-1 and boolean logic

1. www.pubmed.com, click on MeSH link
2. type key words on box search



Diabetes, Gestational

7. **Diabetes mellitus** induced by PREGNANCY but resolved at the end of pregnancy. It does not include previously diagnosed diabetics who become pregnant (PREGNANCY IN DIABETICS). Gestational **diabetes** usually develops in late pregnancy when insulin antagonistic hormones peaks leading to INSULIN RESISTANCE; GLUCOSE INTOLERANCE; and HYPERGLYCEMIA.
Year introduced: 1992

Diabetes Mellitus, Type 2

8. A subclass of **DIABETES MELLITUS** that is not INSULIN-responsive or dependent (NIDDM). It is characterized initially by INSULIN RESISTANCE and HYPERINSULINEMIA; and eventually by GLUCOSE INTOLERANCE; HYPERGLYCEMIA; and overt **diabetes**. Type II **diabetes mellitus** is no longer considered a disease exclusively found in adults. Patients seldom develop KETOSIS but often exhibit OBESITY.
Year introduced: 2005 (1984)

Diabetes Mellitus, Lipoatrophic

9. A type of **diabetes mellitus** that is characterized by severe INSULIN RESISTANCE and LIPODYSTROPHY. The latter may be generalized, partial, acquired, or congenital (LIPODYSTROPHY, CONGENITAL GENERALIZED).
Year introduced: 1979

Diabetes Mellitus, Type 2

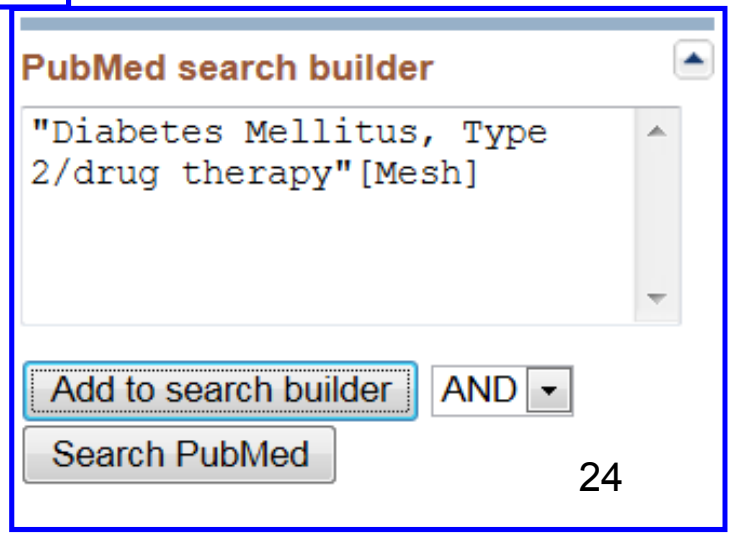
A subclass of **DIABETES MELLITUS** that is not INSULIN-responsive or dependent (NIDDM). It is characterized initi
RESISTANCE and HYPERINSULINEMIA; and eventually by GLUCOSE INTOLERANCE; HYPERGLYCEMIA; and
Type II **diabetes mellitus** is no longer considered a disease exclusively found in adults. Patients seldom develop K
exhibit OBESITY.

Year introduced: 2005 (1984)

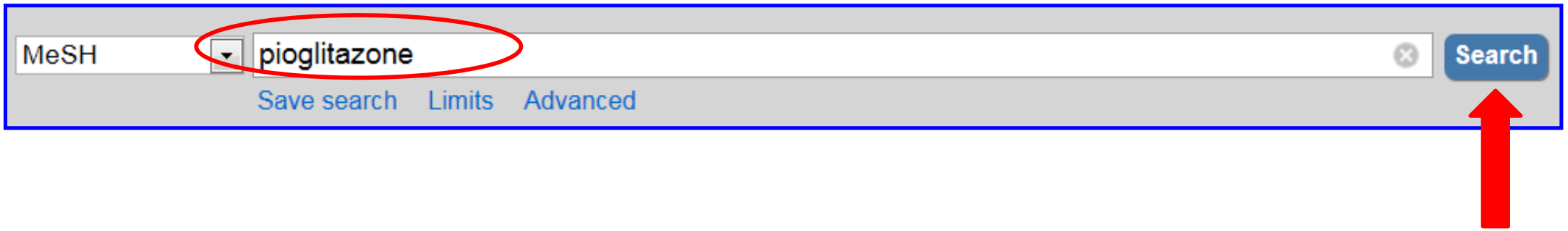
PubMed search builder options

Subheadings:

- [ ] blood
- [ ] cerebrospinal fluid
- [ ] chemically induced
- [ ] classification
- [ ] complications
- [ ] congenital
- [ ] diagnosis
- [ ] diet therapy
- [x] drug therapy
- [ ] economics
- [ ] embryology
- [ ] ethnology
- [ ] etiology
- [ ] genetics
- [ ] history
- [ ] immunology
- [ ] metabolism
- [ ] microbiology
- [ ] mortality
- [ ] nursing
- [ ] parasitology
- [ ] pathology
- [ ] psychology
- [ ] radiography
- [ ] radionuclide imaging
- [ ] radiotherapy
- [ ] rehabilitation
- [ ] surgery
- [ ] therapy
- [ ] transmission
- [ ] ultrasonography
- [ ] urine
- [ ] veterinary



Setting MeSH-2 and boolean logic



pioglitazone [Supplementary Concept]

structure given in first source; PPAR agonist used for type II diabetes

Date introduced: October 2, 1989

Registry Number: 111025-46-8

Heading Mapped to:

- Thiazolidinediones

Entry Terms:

- 5-(4-(2-(5-ethyl-2-pyridyl)ethoxy)benzyl)-2,4-thiazolidinedione
- U 72107A
- U72,107A

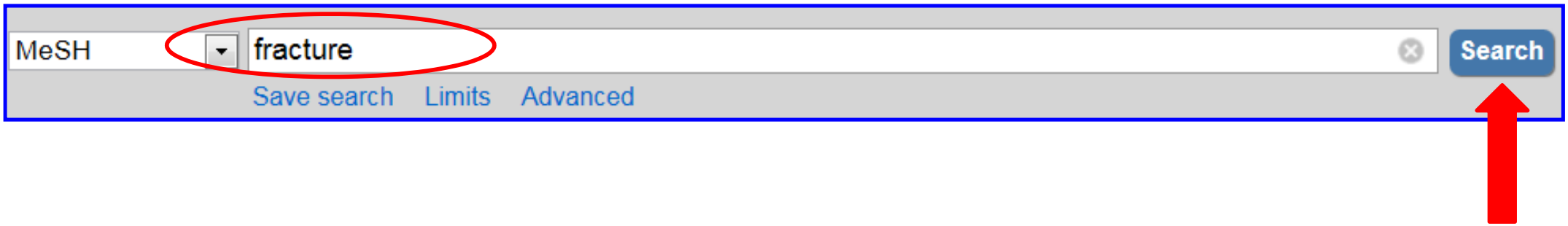
PubMed search builder

```
("Diabetes Mellitus, Type
2/drug therapy"[Mesh])
AND "pioglitazone"
[Supplementary Concept]
```

Add to search builder | AND

Search PubMed

Setting MeSH-3 and Boolean logic



Results: 1 to 20 of 40 Selected: 1

☑ **Fractures, Bone**

1. Breaks in bones.
Year introduced: 2006

☐ **Fracture** Fixation, Internal

2. The use of internal devices (metal plates, nails, rods, etc.) to
Year introduced: 1972(1970)

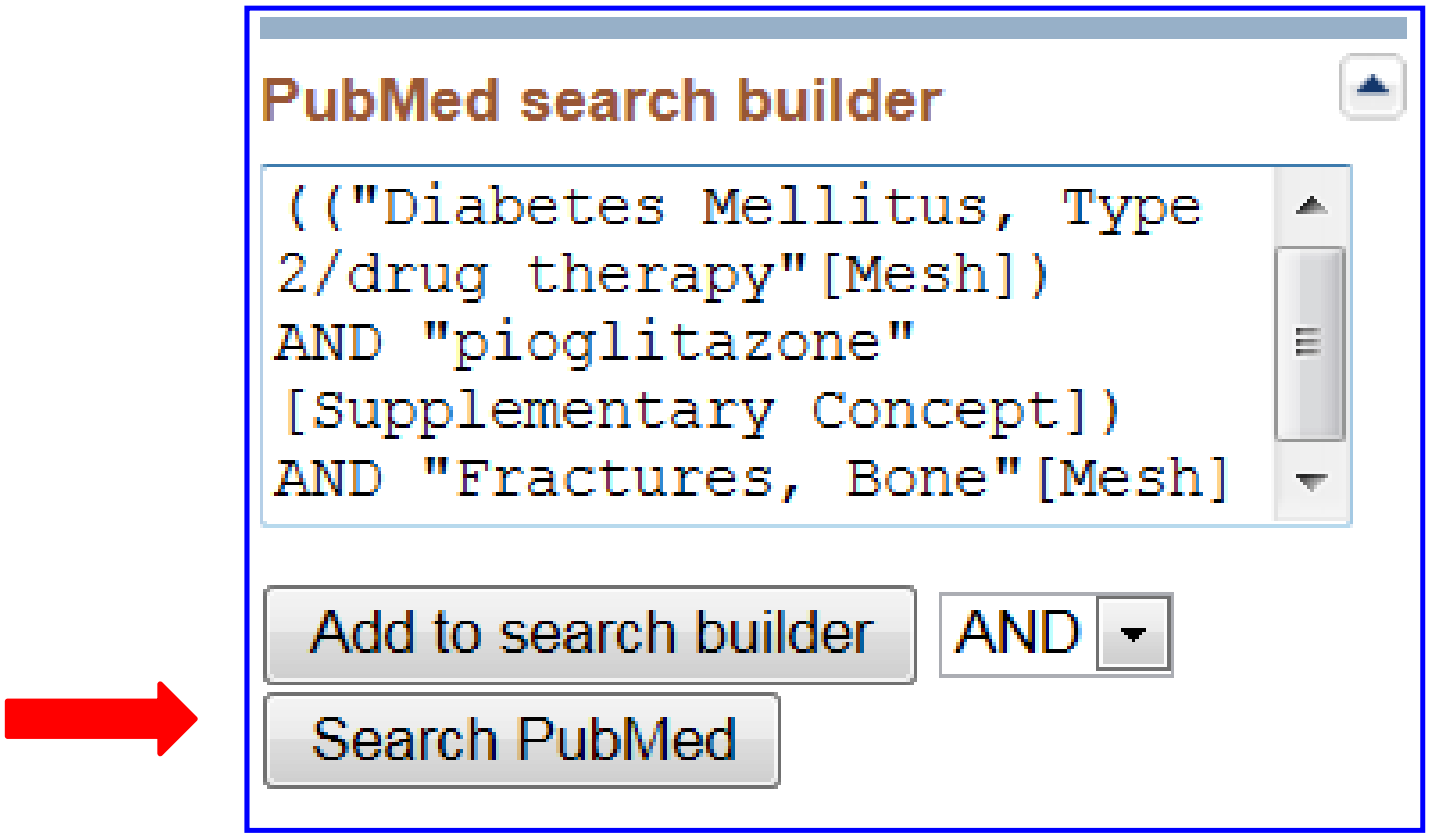
PubMed search builder

```
(("Diabetes Mellitus, Type
2/drug therapy"[Mesh])
AND "pioglitazone"
[Supplementary Concept])
AND "Fractures, Bone"[Mesh]
```

Add to search builder | AND

Search PubMed

Select **Search Pubmed** of menu **Pubmed search builder**



Primary results

Results: 18

1. The skeletal effects of **pioglitazone** in type 2 diabetes or impaired glucose tolerance: a randomized controlled trial.

   Grey A, Bolland M, Fenwick S, Horne A, Gamble G, Drury PL, Reid IR.

   Eur J Endocrinol. 2013 Dec 21;170(2):255-62. doi: 10.1530/EJE-13-0793. Print 2014 Feb.

   PMID: 24217934 [PubMed - indexed for MEDLINE]

   Related citations

2. Effect of **pioglitazone** on body composition and bone density in subjects with prediabetes in the ACT NOW trial.

   Bray GA, Smith SR, Banerji MA, Tripathy D, Clement SC, Buchanan TA, Henry RR, Kitabchi AE, Mudaliar S, Musi N, Ratner RE, Schwenke DC, Stentz FB, Reaven PD, DeFronzo RA.

   Diabetes Obes Metab. 2013 Oct;15(10):931-7. doi: 10.1111/dom.12099. Epub 2013 May 7.

   PMID: 23551856 [PubMed - indexed for MEDLINE]

   Related citations

3. **Pioglitazone**--do we really need it to manage type 2 diabetes?

   Sinha B, Ghosal S.

   Diabetes Metab Syndr. 2013 Jan-Mar;7(1):52-5. doi: 10.1016/j.dsx.2013.02.033. Epub 2013 Mar 13.

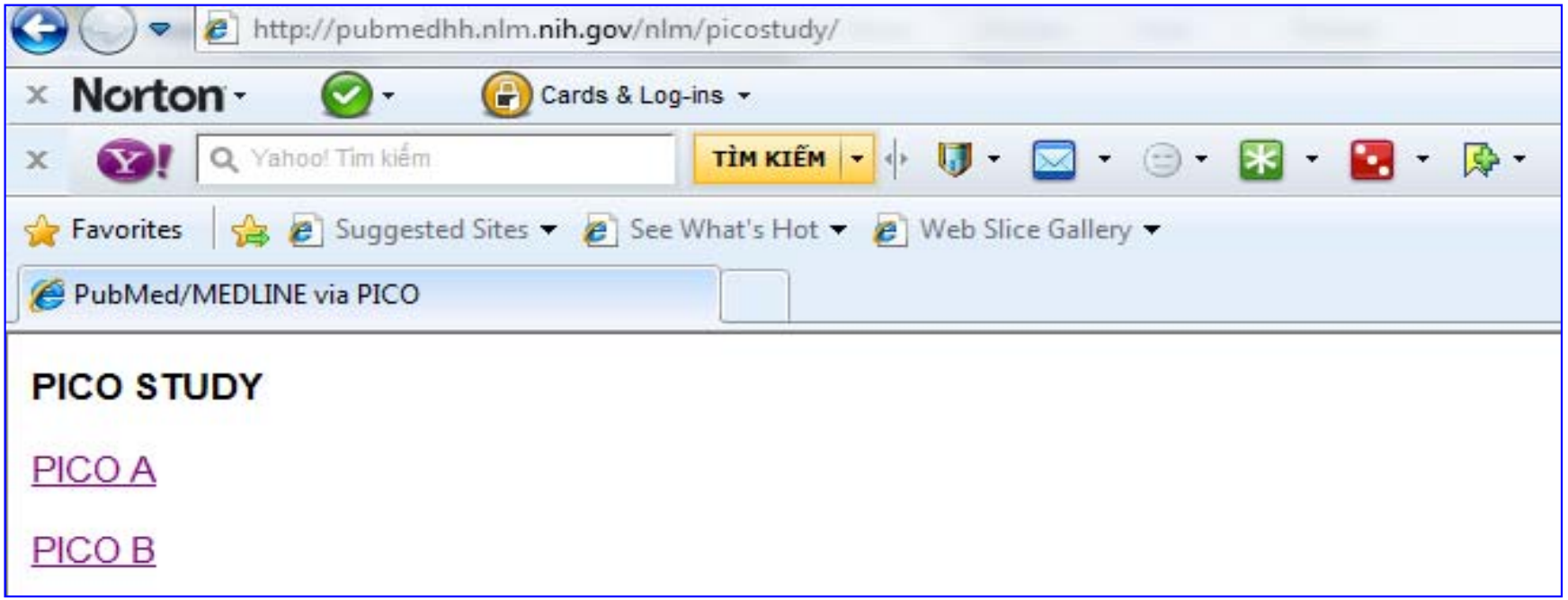
   PMID: 23517798 [PubMed - indexed for MEDLINE]

How to use **PICO tools**

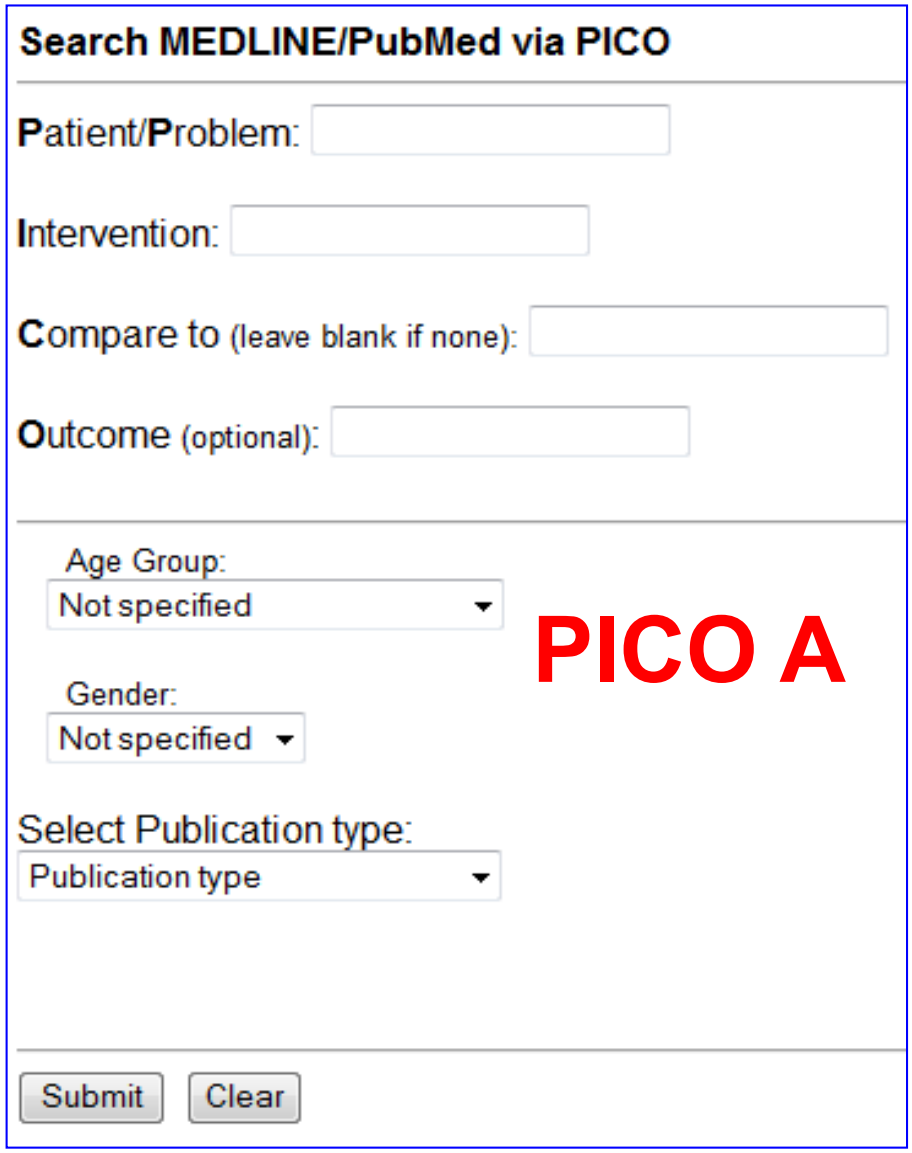
Setting PICO

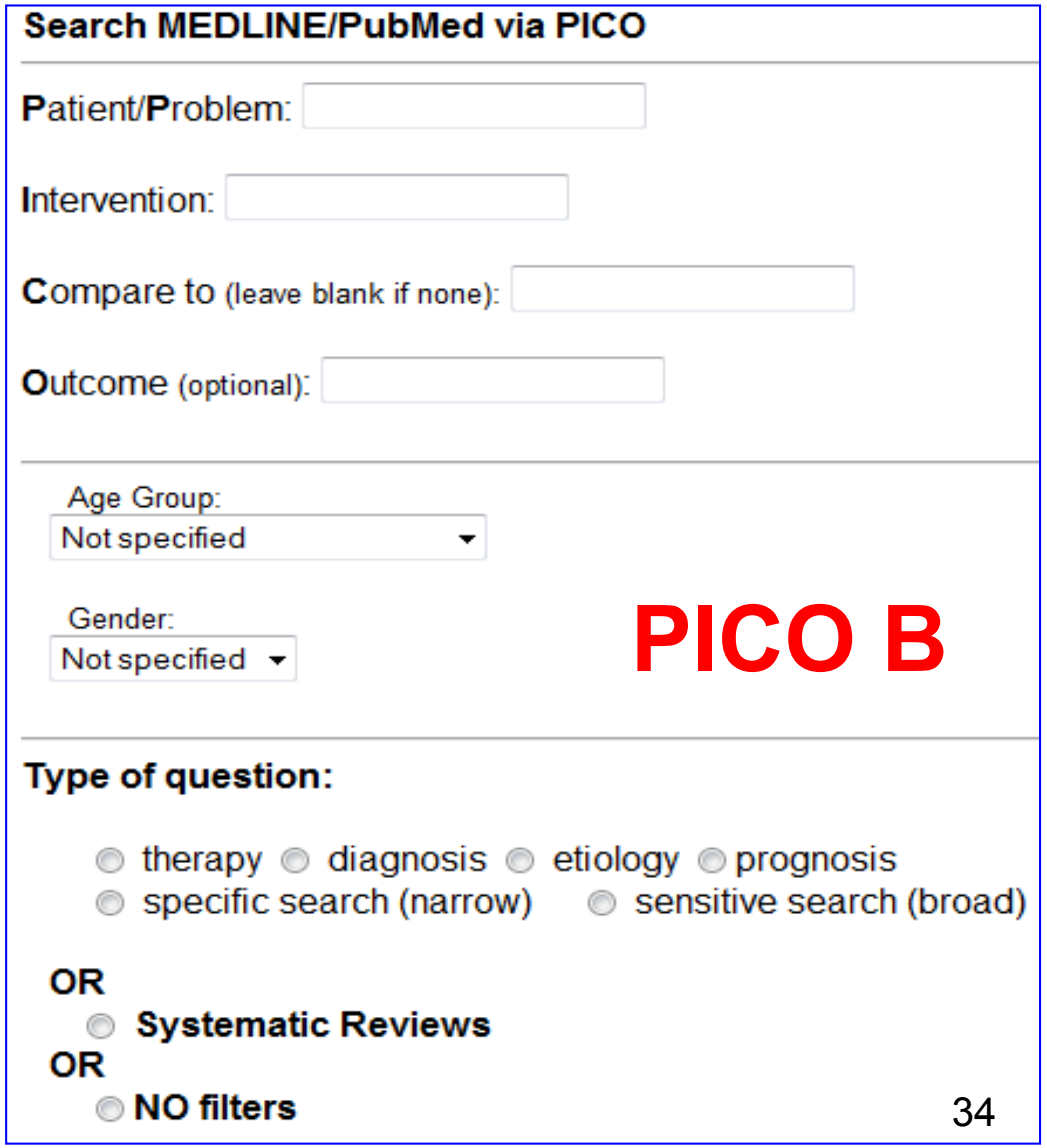
- P: type 2 diabetes
- I: pioglitazone or thiazolidindione
- C: none
- O: fracture

Log on to: http://pubmedhh.nlm.nih.gov/nlm/picostudy/

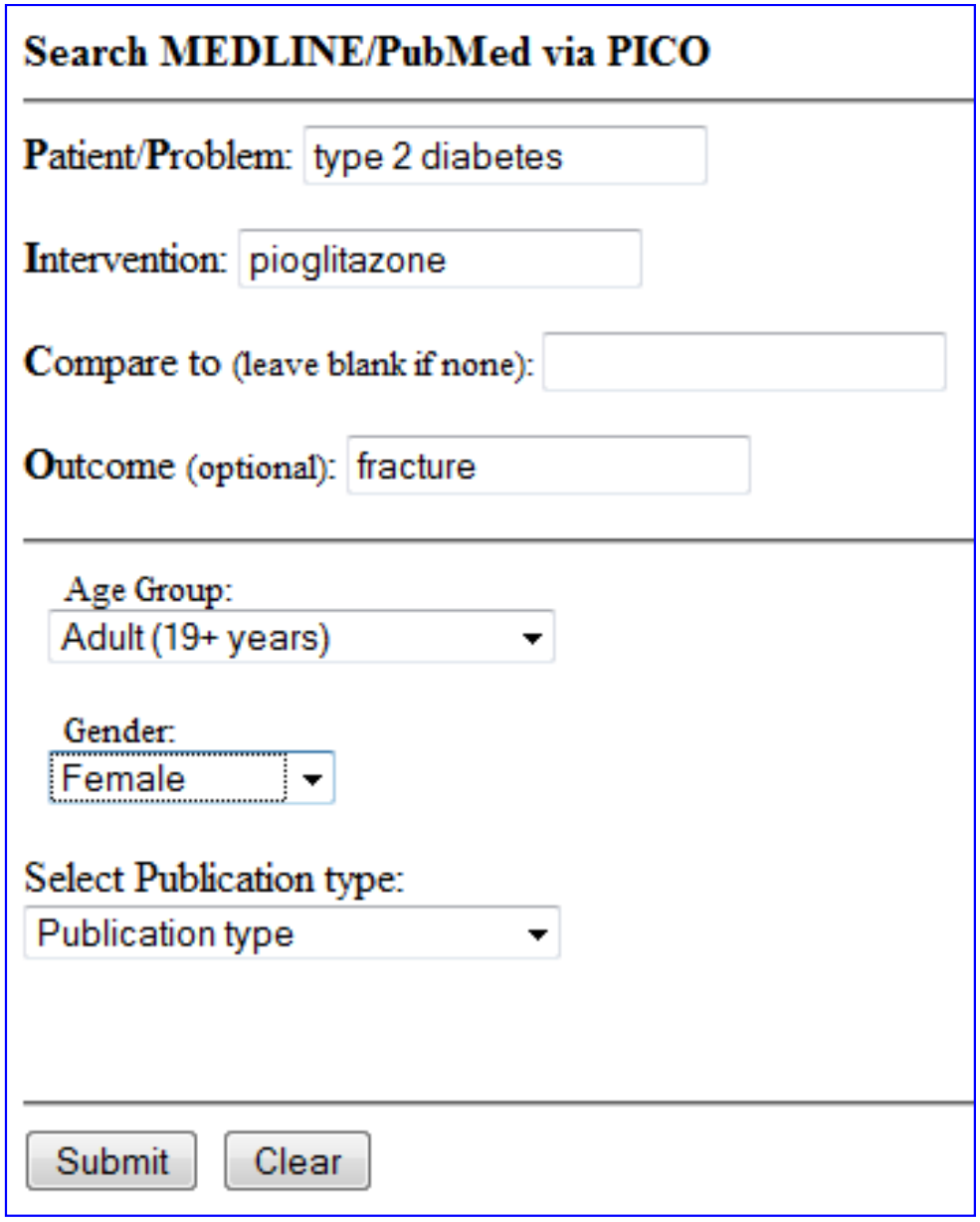


Click on one of two links





Type key words



Results

PubMed for Handhelds
U.S. National Library of Medicine

Results: 16 items

- 1. The skeletal effects of pioglitazone in type 2 diabetes or impaired glucose tolerance: a randomized controlled trial.

Grey A, Bolland M, Fenwick S, Horne A, Gamble G, Drury PL, Reid IR.
Eur J Endocrinol; 2014 Feb ; 170(2):255-62. PubMed ID:
[No Abstract] [Full Text] [Related]

- 2. Comparing pioglitazone to insulin with respect to cancer, cardiovascular and bone fracture endpoints, using propensity score weights.

Vallarino C, Perez A, Fusco G, Liang H, Bron M, Manne S, Joseph G, Yu S.
Clin Drug Investig; 2013 Sep ; 33(9):621-31. PubMed ID:
[No Abstract] [Full Text] [Related]

- 3. Effect of pioglitazone on body composition and bone density in subjects with prediabetes in the ACT NOW trial.

Bray GA, Smith SR, Banerji MA, Tripathy D, Clement SC, Buchanan TA, Henry RR, Kitabchi AE, Mudaliar S, Musi N, Ratner RE, Schw
Diabetes Obes Metab; 2013 Oct ; 15(10):931-7. PubMed ID:
[No Abstract] [Full Text] [Related]

- 4. Hospitalised hip fracture risk with rosiglitazone and pioglitazone use compared with other glucose-lowering drugs.

Colhoun HM, Livingstone SJ, Looker HC, Morris AD, Wild SH, Lindsay RS, Reed C, Donnan PT, Guthrie B, Leese GP, McKnight J, Pea
Scottish Diabetes Research Network Epidemiology Group .
Diabetologia; 2012 Nov ; 55(11):2929-37. PubMed ID:
[No Abstract] [Full Text] [Related]

Summary

- Searching literature is very important
- 3 methods
  - MeSH tool → academic users
  - Clinical queries → busy users
  - PICO → advanced users
- Do practice…practice again…practice more and more