



The Problem of Language

Successful database searching is a matter of identifying the combination of words which occurs in relevant records but not in irrelevant records. In this context a word is broadly defined and can include names, numbers, acronyms, or anything that is constructed of letters or digits or a combination of both. Always remember that search systems do not search for concepts or abstractions. Unfortunately most concepts are represented by a variety of words and phrases. Consider this list of terms which describe "children":

child	nine year old
children	9 year old
fourth grader	boy
4th grader	boys
five year old	girl
5 year old	girls
fifth grader	kid
5th grader	kids
six year old	pediatric patient
6 year old	preadolescent
seven year old	preteen
7 year old	schoolchildren
eight year old	elementary school students
8 year old	



Not only can the age group "children" be represented by many different words and phrases, but it is an ambiguous idea:

- What age range defines children?
- Should infants and adolescents be included?

Example #1:

You are interested in finding case reports of diaphragmatic hernias in children. If your search terms are children and diaphragmatic and hernia, you will not retrieve this record because it does not include the word children:

TI: Unusual cause of traumatic diaphragmatic hernia in a **12-year-old boy**.
AU: Rubio-PA
SO: South-Med-J. 1990 Feb; 83(2): 260-1
AB: A **12-year-old boy** with a short history of dyspnea and occasional left-sided chest pain was discovered to have a diaphragmatic hernia that apparently resulted from minor chest trauma two years earlier. A large portion of the small bowel, part of the transverse colon, and the entire omentum were found in the left side of the chest. The patient recovered uneventfully after primary repair of the diaphragm. Although such lesions are usually associated with relatively severe injuries, this case shows that they may result from any type of chest trauma.

Example #2:

You are interested in finding papers about "*surgery for lung metastases of sarcomas*". You know of three relevant papers:

TI: **Surgery for lung metastases of sarcomas.**

AU: van-Oosterom-AT

SO: Ann-Oncol. 1990 Jul; 1(4): 244

TI: **Surgical treatment for pulmonary metastases from sarcoma.**

AU: Putnam-JB Jr; Roth-JA

SO: Hematol-Oncol-Clin-North-Am. 1995 Aug; 9(4): 869-87

TI: **Pulmonary resection for metastatic soft tissue sarcomas.**

AU: Kawai-A; Fukuma-H; Beppu-Y; Yokoyama-R; et al.

SO: Clin-Orthop. 1995 Jan(310): 188-93

After examining the vocabulary in these three citations you realize that any relevant records retrieved must contain terms in the following combinations:

Either

"resection" OR "surgery" OR "surgical"

AND either

"pulmonary" OR "lung"

AND either

"metastases" OR "metastatic"

AND either

"sarcoma" OR "sarcomas"

A search using only this combination of words, "*surgery AND lung AND metastases AND sarcomas*", would fail to retrieve two thirds of the potentially relevant records.

adverbs
plural noun
singular noun
adjectives

Word Endings

Words usually have different endings depending on the part of speech they represent: verb, adverb, adjective, noun, etc. In addition, nouns may be plural or singular. Most computer search systems will only retrieve the form of the word specified by the searcher.

A few systems may automatically search for plurals and singular forms of nouns and some may automatically add truncation to the end of search term, but in general these features are not very common and they do not solve all vocabulary problems.

Examine the eight titles below.

- How many forms of the words injury and gymnastics can you identify?
- How many of these titles would be retrieved by a search for all records containing the terms *gymnastics* and *injuries*?

TI: Balancing *gymnastics* and *injury* risk : a review of the literature

TI: *Gymnastic* wrist *injuries*

TI: How to tape the *injured gymnast*

TI: Lower extremity *injuries* in *gymnastics*

TI: Epidemiology of *injury* in Australian female *gymnasts*

TI: *Gymnastics injuries*: recognition and management

TI: Young *gymnasts*: *injury* prone, less flexible

TI: Coaches decision making about the participation of *injured gymnasts* in competition

In the titles above there are four variations of the word gymnastics and three variations of the word injuries:

gymnast	injured
gymnastic	injuries
gymnastics	injury
gymnasts	

Only two of the titles contain the words *gymnastics* and *injuries*.

☞ *Truncation & wildcard symbols simplify the problem of word endings.* ☞

Synonyms / Related Terms

Synonyms or near synonyms occur commonly in writing. Searchers must be constantly alert for them. Even words which are not synonyms may be sufficiently related to merit consideration in a search.

☞ Please review the following five examples. ☞

Example 1

In this first example the three synonyms or related terms are: *familial*, *hereditary*, and *inherited*. While the word *familial* doesn't necessarily mean hereditary, it is often used in that context.

- TI: Comparison of sporadic and *hereditary* forms of medullary thyroid carcinoma.
- TI: Cutaneous lichen amyloidosis and *familial* medullary thyroid carcinoma
- TI: RET proto-oncogene mutations in *inherited* and sporadic medullary thyroid cancer.
- TI: *Familial* medullary thyroid carcinoma: report of three cases in a family.
- TI: Primary *hereditary* medullary thyroid carcinoma--C-cell morphology and correlation with preoperative calcitonin levels.
- TI: Application of genetic screening in families with *hereditary* medullary thyroid carcinoma.
- TI: Genetic testing and early thyroidectomy for *inherited* medullary thyroid carcinoma.

Example 2

In this example the two pairs of synonyms are given: *male/men* and *female/women*. Note that these aren't exact synonyms because male and female do not necessarily refer to adults.

- TI: Size comparison of the *male* and *female* human corpus callosum from autopsy samples.
- TI: The relationship of hand preference to anatomy of the corpus callosum in *men*.
- TI: Corpus callosum and brain volume in *women* and *men*.
- TI: Agenesis of the corpus callosum: *female* monozygotic triplets.
- TI: Analysis of cross-sectional area measurements of the corpus callosum adjusted for brain size in *male* and *female* subjects from childhood to adulthood.

Example 3

Terms which are related but not synonyms should always be considered when searching bibliographic databases. In this example coffee and caffeine are the related terms.

- TI: Effect of *coffee* on ambulatory blood pressure in patients with treated hypertension.
- TI: The effects of *caffeine* on ambulatory blood pressure, heart rate, and mood in *coffee* drinkers.
- TI: The effect of chronic *coffee* drinking on blood pressure: a meta-analysis of controlled clinical trials.
- TI: The effect of *caffeine* on ambulatory blood pressure in hypertensive patients.
- TI: Effects of *coffee* on ambulatory blood pressure in older men and women: A randomized controlled trial.
- TI: *Caffeine* abstinence augments the systolic blood pressure response to adenosine in humans.
- TI: *Caffeine* elevates blood pressure response to exercise in mild hypertensive men.

Example 4

This is an example of drug names which are exact synonyms. There are several standards for generic drug names two of which are the *USAN* (U. S. Adopted Name) and the *INN* (International Nonproprietary Name). In most cases the *USAN* and *INN* use the same name, but occasionally they do not. The bronchodilator known as Albuterol (*USAN*) in the U.S. is known as Salbutamol (*INN*) in the rest of the world.

- TI: Nebulised *salbutamol* with and without ipratropium bromide in acute airflow obstruction
- TI: A comparison of ipratropium and *albuterol* vs albuterol alone for the treatment of acute asthma.
- TI: Efficacy of frequent nebulized ipratropium bromide added to frequent high-dose *albuterol* therapy in severe childhood asthma
- TI: Randomized controlled trial of ipratropium bromide and frequent low doses of *salbutamol* in the management of mild and moderate acute pediatric asthma
- TI: The effect of adding ipratropium bromide to *salbutamol* in the treatment of acute asthma: a pooled analysis of three trials.
- TI: Superiority of ipratropium plus *albuterol* over albuterol alone in the emergency department management of adult asthma: a randomized clinical trial.
- TI: A comparative study of bronchodilator actions of ipratropium bromide (atrovent) & *salbutamol* (ventolin) on exercise induced bronchial asthma.

Example 5

The synonym pair in this example is *deaf* / *hearing-impaired*. While perhaps not exact synonyms they are closely related:

- TI: Reading comprehension strategies used by *deaf* middle-school students.
- TI: *Hearing-impaired* students' performance on tests of visual processing: relationships with reading performance.
- TI: *Deaf* children reading fables: using ASL summaries to improve reading comprehension.
- TI: Specialized cognitive function and reading achievement in *hearing-impaired* adolescents.
- TI: Reading comprehension of *deaf* readers. The impact of too many or too few questions.

Abbreviations, Acronyms & Initialisms

There are many acronyms, abbreviations, and initialisms in health care and the sciences:

- MI** - Myocardial Infarction / Michigan
- NDA** - New Drug Application
- MCV** - mean corpuscular volume / molluscum contagiosum virus / middle cardiac vein / motor conduction velocities
- GB** - Great Britain / glycoprotein B / GB Virus / gigabyte
- REM** - Rapid Eye Movement
- Dias.** - Diastolic
- Inj.** - Injection / Injury

These should be treated like synonyms and used whenever they are likely to occur. Please review the following examples.

Example 1: Initialisms.

Initialisms occur commonly in the health sciences literature. The following titles provide an illustration:

- TI:** Perception of fatigue and quality of life in patients with *COPD*.
- TI:** Meta-analysis of the effects of psychoeducational care in adults with *chronic obstructive pulmonary disease*.
- TI:** Loneliness, depression, and social support of patients with *COPD* and their spouses.
- TI:** Psychometric properties of the functional performance inventory in patients with *chronic obstructive pulmonary disease*.

Unfortunately the same abbreviation may be used for more than one phrase:

- ornithine transcarbamylase (OTC)
- over the counter (OTC)

Usually the other terms in the search will provide enough "context" so that items with the "wrong" initialism aren't retrieved.

Example 2: Acronyms

Acronyms are very common in the literature. Acronyms are pronounceable initialisms and often take the form of a true word. Therefore acronyms have the problem of not necessarily representing a single concept:

- cAMP regulates vegetative growth and cell cycle in *Candida albicans*.

... and may also represent a real word:

- Bereavement summer camp for children and teens: a reflection of nine years.
- Camp experiences and developmental outcomes for youth.

The following titles illustrate how some authors use acronyms, some spell out the words, and some use both. Also note all the other acronyms, abbreviations and initialisms in these titles!

- TI:** Metabolic hyperfrontality and psychopathology in the ketamine model of psychosis using *positron emission tomography (PET)* and [18F]fluorodeoxyglucose (FDG).
- TI:** Normal brain F-18 FDG-*PET* and MRI anatomy.
- TI:** 18F-fluorodeoxyglucose *positron emission tomography* study of brain metabolism in cirrhosis: effect of liver transplantation.
- TI:** Preoperative evaluation of 54 gliomas by *PET* with fluorine-18-fluorodeoxyglucose and/or carbon-11-methionine.
- TI:** Forebrain activation in REM sleep: an FDG *PET* study.
- TI:** Cerebral metabolic rate for glucose during the first six months of life: an FDG *positron emission tomography* study.

Example 3: Abbreviations

Abbreviations are not as common in the literature as acronyms and initialisms, but they do occur and must also be considered:

- TI:** When nonreinforcing doses of cocaine (3.2-25 micrograms/kg/*injection*) were combined with heroin ...
 - TI:** Rats were allowed to self-administer heroin (50 microg/kg per *inj.*, 14 daily sessions), cocaine (500 microg/kg per *inj.*, 10 daily sessions) or saline.
 - TI:** At higher (56-100 micrograms/kg per *injection*) unit doses of cocaine, antagonists generally increased and then decreased ...
 - TI:** The initial training for all rats was a combined dose of 18 microg/kg/*inj* of heroin (H) plus 300 microg/kg/*inj* of cocaine (C).
-

Example 4:

Sometimes initialisms aren't obvious because they don't match the common phrase they represent. This happens in medical terminology where Latin initialisms are used, but the phrase is in a modern language:

b.i.d = bis in die (latin for twice a day)

- TI:** Clarithromycin 250 mg *b.i.d.* for 5 or 10 days in the treatment of adult patients with purulent bronchitis.
- TI:** Randomized comparison of once-daily cefibuten and *twice-daily* clarithromycin in the treatment of acute exacerbation of chronic bronchitis.
- TI:** Etiology, susceptibility, and treatment of acute bacterial exacerbations of complicated chronic bronchitis in the primary care setting: ciprofloxacin 750 mg *b.i.d* versus clarithromycin 500 mg *b.i.d.* Bronchitis Study Group.

Antonyms



People can look at things from different perspectives (*Is the sky partly cloudy or partly sunny*) or say the same thing in opposite ways (*Don't get wet! / Stay dry!*).

Words with opposite meanings (*cloudy/sunny, wet/dry*) are called antonyms.

As the following two examples illustrate, searchers should consider treating antonyms as alternate terms.

Example 1: Including women in clinical trials.

In the following titles some authors use the word inclusion and some exclusion. All these titles are probably relevant.

- TI: Don't test, do sell: legal implications of *inclusion* and *exclusion* of women in clinical drug trials.
- TI: *Inclusion* of women in clinical trials: a historical overview of scientific, ethical, and legal issues.
- TI: The *exclusion* of women from clinical trials of thrombolytic therapy: implications for developing the thrombolytic predictive instrument database.
- TI: The *inclusion* of women in psychopharmacologic trials.
- TI: The *exclusion* of the elderly and women from clinical trials in acute myocardial infarction
- TI: The *inclusion* of women in clinical trials of antihypertensive medications: a review of twenty-four trials in one pharmacology journal.

Example 2: Compliance with therapy among diabetic children and adolescents.

In the following titles, the antonym is fairly obvious: *non*compliance.




- TI: Psychologic predictors of *compliance* in children with recent onset of diabetes mellitus.
- TI: Prevalence and predictors of pervasive *noncompliance* with medical treatment among youths with insulin-dependent diabetes mellitus.
- TI: A hypnotherapeutic approach to the improvement of *compliance* in adolescent diabetics.
- TI: Judy was an expert on diabetes ... and *noncompliance*.
- TI: Factors associated with *non-compliance* with a medical follow-up regimen after discharge from a pediatric diabetes clinic.

Note that the word in the last title is hyphenated: non-compliance. Hyphenated phrases are treated differently by different search systems. See the section on punctuation for more information.



Hierarchical / Group Concepts

When a concept in your search represents a group of something, you must search the *general group term* and *all the terms for individual members of the group*. If you need to retrieve all items about water fowl, you must search the terms: *water fowl, duck, ducks, goose, geese, swan, swans*, etc.

Water Fowl		
		
Swan	Duck	Goose

When searching for a concept which represents some kind of group you must **remember three points**:

1. **The first point** to remember is that people organize everything. Much of this organization is hierarchical:

Leg Bones

Femur
 Femur Head
 Femur Neck
 Fibula
 Patella
 Tibia

Sex

Female
 Woman
 Girl
 Male
 Man
 Boy

Bible

Old Testament
 Genesis
 Exodus
 Leviticus
 New Testament
 Matthew
 Mark
 Luke

Time

Century
 Decade
 Year
 Month
 Day
 Hour
 Minute

2. **The second point** to remember is that people also tend to communicate using **precise rather than general terms**:

"I have the flu."	not	"I have a viral infection."
"He lives in Pittsburgh."	not	"He lives in Pennsylvania."
"She is his sister."	not	"She is his sibling."
"He has a stress fracture of the tibia"	not	"He has a stress fracture in one of his leg bones."
"I need ibuprofen."	not	"I need a non-steroidal anti-inflammatory agent."

This is especially true of writing in professional and scientific journals.

The **third point** to remember is that computer retrieval systems **search for words not for concepts**. They only find items with the word combinations you ask for. If you ask most search systems to search for the term *fruit* they will not "know" to search specific fruit names: *apple, peach, orange, pear, banana* etc.. Only items which contain the word *fruit* will be retrieved.

An Illustration

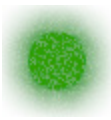
The following titles are from papers about treating Lyme disease with antibiotics. Note how few of the titles use a general drug term such as antibiotic(s) or antimicrobial(s):

TI: Comparison of oral <i>cefexime</i> and intravenous ceftriaxone followed by oral <i>amoxicillin</i> in ...
TI: A controlled trial of <i>antimicrobial</i> prophylaxis for Lyme disease after deer-tick bites.
TI: Clinical manifestations and <i>antibiotic</i> treatment of Lyme disease.
TI: Comparison of <i>cefuroxime axetil</i> and <i>doxycycline</i> in the treatment of early Lyme disease.
TI: <i>Penicillin G sodium</i> and <i>ceftriaxone</i> in the treatment of neuroborreliosis in children.--
TI: Randomized comparison of <i>ceftriaxone</i> and <i>cefotaxime</i> in Lyme neuroborreliosis.
TI: <i>Amoxicillin</i> plus <i>probenecid</i> versus <i>doxycycline</i> for treatment of erythema migrans borr...
TI: Treatment of Lyme disease. Best use of <i>antibiotics</i> .
TI: A randomized trial of <i>ceftriaxone</i> versus oral penicillin for the treatment of early ...
TI: <i>Cefotaxime</i> versus penicillin in the late stage of Lyme disease -- prospective, randomized ...
TI: <i>Antibiotic</i> treatment in Lyme borreliosis.
TI: Lyme disease: insights into the use of <i>antimicrobials</i> for prevention and treatment in the ...
TI: Comparison of <i>cefuroxime axetil</i> and <i>doxycycline</i> in treatment of patients with early Lyme ...
TI: <i>Roxithromycin</i> in the treatment of Lyme disease--update and perspectives.
TI: Comparison of intravenous <i>penicillin G</i> and oral <i>doxycycline</i> for treatment of Lyme neuro...
TI: Controversies in the use of <i>antimicrobials</i> for the prevention and treatment of Lyme disease.
TI: <i>Ceftriaxone</i> in the treatment of Lyme neuroborreliosis.
TI: <i>Azithromycin</i> compared with <i>amoxicillin</i> in the treatment of erythema migrans.
TI: <i>Azithromycin</i> versus <i>doxycycline</i> for treatment of erythema migrans: clinical and microbial...
TI: <i>Tetracycline</i> therapy for chronic Lyme disease.

A search for all papers about antibiotic therapy for Lyme disease would need to include all the likely antibiotics:

Antibiotic* OR Antimicrobial* OR Amoxicillin OR Azithromycin OR
Ceftriaxone OR Cefotaxime OR Doxycycline OR Penicillin OR Tetracycline OR
Phenoxymethylpenicillin . . .

Remember, if you ask the search system to search for antibiotics, it will search for that exact word. If the word antibiotics isn't present, the record won't be retrieved even if that is what the paper was about!



Fuzzy Concepts

Sometimes it is very hard to gather all the terms needed to define a concept. If you examine the titles in the list below you will note that all of them discuss the treatment of hay fever. If you look carefully you will note that:

- ❖ The vocabulary for the condition is represented in the majority of records by the phrases: "*hay fever*" or "*allergic rhinitis*".
- ❖ The vocabulary for the concept "treatment" is harder to identify. Some titles include the words "treatment" or "immunotherapy", but the majority do not. In some of the titles the context provides the indication that the paper discusses treatment.

Carefully examine this list of titles. Can you think of an easy way to search the treatment concept?

TI: Management of allergic rhinitis with a combination antihistamine/anti-inflammatory agent.
TI: Effects of orally inhaled budesonide in seasonal allergic rhinitis.
TI: Comparative study of terfenadine and cetirizine in hay fever: assessment of efficacy and central nervous system effects.
TI: Cetirizine, loratadine, or placebo in subjects with seasonal allergic rhinitis: effects after controlled ragweed pollen challenge in an environmental exposure unit.
TI: Hay fever: pharmacotherapy or immunotherapy?
TI: Efficacy, pharmacodynamics, and pharmacokinetics of CGP 51901, an anti-immunoglobulin E chimeric monoclonal antibody, in patients with seasonal allergic rhinitis.
TI: Cetirizine treatment of rhinitis in children with pollen allergy: evidence of its antiallergic activity.
TI: Azelastine nasal spray as adjunctive therapy to azelastine tablets in the management of seasonal allergic rhinitis.
TI: Use of an anti-IgE humanized monoclonal antibody in ragweed-induced allergic rhinitis.
TI: Fluticasone propionate aqueous nasal spray compared with oral loratadine in patients with seasonal allergic rhinitis.
TI: Treatment with hot, humid air reduces the nasal response to allergen challenge.
TI: Preseasonal intranasal immunotherapy in birch-alder allergic rhinitis.
TI: Brompheniramine, terfenadine, and placebo in allergic rhinitis.
TI: Astemizole in combination with pseudoephedrine in the treatment of seasonal allergic rhinitis.
TI: Efficacy and safety of mizolastine in seasonal allergic rhinitis. The Rhinase Study Group.



A solution to “fuzzy concepts”:

Subject Indexing

If someone would add certain *standard terms* for treatment to the records represented by the titles above, searching for information on treatments for hay fever would be much simpler. Fortunately, that's exactly what happens!

In most bibliographic databases people called *indexers* add standardized subject terms to the descriptor field of each record. Indexers who create Medline records would add one or both of the these two headings to *every* the record about treating hay fever:

- ❖ Hay Fever - drug therapy
- ❖ Hay Fever - therapy *(used for immunotherapy)*

If the searcher remembers to use the subject headings, then he doesn't need to worry about the vocabulary issues associated with "fuzzy concepts." Unfortunately not every database has added subject terms which are standardized. Of course, web pages aren't assigned standard subject terms!



Word Location

The location of a term in a record can change:

- the **meaning** of the term
- the **significance** of the term

First Case: the field in which a word occurs affects its meaning.

Example 1:

In the first record below the word floss occurs in the **title field**. If the word floss occurs in the **author field**, as it does in record 2, the word has a completely different meaning:

Record 1:

TI: Fluoride uptake in situ after the use of dental **floss** with fluoride.
AU: Modesto-A; Souza-I; Cordeiro-P; Silva-L; Primo-L; Vianna-R
SO: J-Clin-Dent. 1997; 8(5): 142-4

Record 2:

TI: A role for FGF-6 in skeletal muscle regeneration.
AU: **Floss**-T; Arnold-HH; Braun-T
SO: Genes-Dev. 1997 Aug 15; 11(16): 2040-51

Example 2:

In example 1, the meaning of the word changed drastically because in one instance it was descriptive term and in the other it was a proper name. In the two records below the word Creighton is a proper name; however, in record 1 it is an institutional name and in record 2 it is a personal name.

Record 1:

TI: Aid for preventing aspiration/ingestion of single crowns.
AU: Wilcox-CW; Wilwerding-TM
AD: **Creighton** University, School of Dentistry, Omaha, NE 68178, USA.
SO: J-Prosthet-Dent. 1999 Mar; 81(3): 370-1

Record 2:

TI: Common pediatric dental problems.
AU: **Creighton**-PR
AD: Department of Pediatric Dentistry, School of Dental Medicine, State University of New York at Buffalo, USA.
SO: Pediatr-Clin-North-Am. 1998 Dec; 45(6): 1579-60

Most search systems will allow you to restrict a word to a particular field

Second Case: The field in which a word occurs effects its significance or importance.

Example 1:

In the first record below the word *ibuprofen* occurs in the **title field** (as well as the abstract field). In the second record the word *ibuprofen* only occurs in the abstract. Ibuprofen is the focus of the first paper (*record 1*). This is reflected by the occurrence of the word in the article title. In the second paper (*record 2*) ibuprofen received only passing mention. It was not a significant aspect of the paper.

Record 1:

TI: The pharmacokinetics of *ibuprofen* suspension, chewable tablets, and tablets in children with cystic fibrosis.

SO: J-Pediatr. 1999 Jan; 134(1): 58-63

AB: OBJECTIVES: The objectives of this study were to compare the pharmacokinetic parameters of *ibuprofen* administered as a suspension, chewable tablet, or tablet in children with cystic fibrosis and to determine the optimal blood sampling times for measuring ibuprofen peak concentrations. STUDY DESIGN: A single oral 20 mg/kg dose of *ibuprofen* was administered, and blood samples were obtained at 15, 30, 45, 60, 120, 240, and 360 minutes after the dose was administered. Peak plasma concentration (C_{max}), time to peak concentration (T_{max}), and other pharmacokinetic parameters were determined and compared (analysis of variance and analysis of covariance). RESULTS: Thirty-eight children were included (22, 4, and 12 in the suspension, chewable tablet, and tablet groups, respectively). T_{max} was the only parameter for which statistical differences were noted (suspension vs tablet, P ≤ .02). After age and sex were removed as potential confounding variables, T_{max} remained statistically different (P ≤ .001). CONCLUSIONS: A 20 mg/kg dose of *ibuprofen* suspension is recommended, with blood samples for pharmacokinetic analysis obtained 30, 45, and 60 minutes after the dose is administered. Obtaining the first blood sample 1 hour after dose administration will miss approximately 90% of peak concentrations, increasing the likelihood of overdosing.

Record 2:

TI: Does propofol reduce vomiting after strabismus surgery in children?

SO: Acta-Anaesthesiol-Scand. 1997 Sep; 41(8): 973-7

AB: BACKGROUND: Previous studies have indicated that propofol anaesthesia may reduce the incidence of postoperative nausea and vomiting after strabismus surgery in children. This study was designed to investigate the incidence of vomiting after strabismus surgery at two different levels of propofol anaesthesia compared to thiopental/isoflurane anaesthesia. METHODS: Ninety ASA class I or II children, aged 5-14 yrs were randomly assigned to one of three groups: Group T/I (n = 30) induction with 5 mg kg⁻¹ of thiopental and maintenance with isoflurane, group P5 (n = 31) induction with propofol 2 mg kg⁻¹, maintenance with propofol infusion 5 mg kg⁻¹ h⁻¹ or group P10 (n = 29) induction with propofol 2 mg kg⁻¹, maintenance with propofol 10 mg kg⁻¹ h⁻¹. All received glycopyrrolate, vecuronium, fentanyl and controlled ventilation with O₂/N₂O 30/70. Ketorolac i.v. was given to prevent postoperative pain. If additional analgesia was needed, *ibuprofen*/acetaminophen or buprenorphine was given according to clinical need. RESULTS: There were no differences between

study groups with respect to age, weight, history of previous anaesthesia or emesis after previous anaesthesia, duration of anaesthesia, surgery or sleep after anaesthesia, or number of muscles operated. The incidence of vomiting was 37%, 29% and 28% in groups T/I, P5 and P10, respectively. There were no statistically significant differences between the three groups in the incidence of vomiting. The median age of patients who vomited was 7.5 (range 5.0-13.7) yrs while the median age of the patients who did not vomit was 9.1 (range 5.0-14.0) yrs ($P < 0.01$). CONCLUSION: In the present study, propofol anaesthesia compared to thiopental/isoflurane anaesthesia did not reduce the incidence of vomiting following strabismus surgery in children.

Example 2:

Some databases designers try to indicate the relative importance of the various topics discussed in a paper. This is accomplished by designating descriptors (*controlled vocabulary terms*) as major and minor topics. In **record 1** the indexer believed that the diagnosis of bacterial pneumonia was a primary focus of the paper; therefore the heading "**Pneumonia, -Bacterial -diagnosis**" was designated as major MeSH heading. In **record 2**, the the diagnosis of pneumonia was a secondary aspect of the paper so the heading "**Pneumonia, -Bacterial -diagnosis**" was designated minor. Read the titles. Do you agree with the indexer's decisions?

Record 1:

TI: A comparison of mini-bronchoalveolar lavage and blind-protected specimen brush sampling in ventilated patients with suspected pneumonia.

SO: J-Crit-Care. 1998 Jun; 13(2): 67-72

MESH (minor): Adult-; Aged-; Aged,-80-and-over; APACHE-; Bacteriological-Techniques-instrumentation; Critical-Care; Cross-Infection-microbiology; Middle-Age; Patient-Care-Team; Pneumonia,-Bacterial-microbiology; Respiratory-Therapy; Sensitivity-and-Specificity

MESH (major): *Bronchoalveolar-Lavage-Fluid-microbiology; *Cross-Infection-diagnosis; ***Pneumonia,-Bacterial-diagnosis**; *Respiration,-Artificial; *Specimen-Handling-instrumentation

Record 2:

TI: Pulmonary disposition of vancomycin in critically ill patients.

SO: Eur-J-Clin-Microbiol-Infect-Dis. 1997 May; 16(5): 385-8

MESH (minor): Aged-; Antibiotics,-Glycopeptide-therapeutic-use; Bronchoscopy-; Critical-Illness; Injections,-Intravenous; Middle-Age; **Pneumonia,-Bacterial-diagnosis**; Pneumonia,-Bacterial-physiopathology; Prospective-Studies; Respiration,-Artificial; Staphylococcal-Infections-diagnosis; Staphylococcal-Infections-physiopathology; Treatment-Outcome; Vancomycin-therapeutic-use

MESH (major): *Antibiotics,-Glycopeptide-pharmacokinetics; *Bronchoalveolar-Lavage-Fluid-chemistry; *Methicillin-Resistance; *Pneumonia,-Bacterial-drug-therapy; *Staphylococcal-Infections-drug-therapy; *Vancomycin-pharmacokinetics



Phrasing / Word Proximity

Identifying and properly combining all the appropriate search terms is one of the keys to successful searching. Unfortunately the item retrieved can have the correct combination of terms, but not in the proper context. These records are called false drops.

For example, a searcher interested in hearing aids might specify this combination of terms:

hearing AND EITHER aid OR aids

All of the titles in the following example would be retrieved by this search formulation. Note that some of the titles are not relevant!

- TI: Decreased use of **hearing aids** following training in **hearing** tactics.
- TI: Comparison of two digital **hearing aids**.
- TI: What deaf and hard-of-**hearing** adolescents know and think about **AIDS**.
- TI: Human immunodeficiency virus and acquired immune deficiency syndrome
AIDS-related **hearing** disorders.
- TI: Do children's reactions to peers who wear visible **hearing aids** always tend to be negative?
- TI: Speech intelligibility in noise with fast compression **hearing aids**.
- TI: Evaluating tactile **aids** for speech perception and production by **hearing**-impaired adults and children.
- TI: Knowledge and attitudes about **AIDS** among deaf and hard of **hearing** persons.

Most search systems allow the searcher to specify the proximity of the search terms. It is possible to specify:

hearing ADJACENT TO EITHER aid OR aids



Specifying word proximity can solve some problems, but it must be used carefully. In the previous example, if the word hearing isn't immediately followed by the word aids, the subject is probably not about "hearing aids". However consistent phrasing is the exception not the rule.

Suppose you had to search the topic "calcium absorption in the intestine". You probably wouldn't want to retrieve records in which the words calcium and absorption weren't in the same sentence, but would want them to be adjacent?

Some authors may say "calcium absorption" (adjacent) while others may say "absorption of calcium" (not adjacent - "of" intervenes). This problem is illustrated by the following titles:

- TI: **Calcium** and magnesium **absorption** from the colon and rectum are increased in rats fed fructooligosaccharides.
- TI: The effect of **calcium** carbonate and **calcium** citrate on the **absorption** of zinc in healthy female subjects.
- TI: Intestinal **absorption** of **calcium** from **calcium** ascorbate in rats.
- TI: Absorbability of **calcium** sources: the limited role of solubility.
- TI: **Calcium** does not inhibit iron **absorption** or alter iron status in infant piglets adapted to a high **calcium** diet.
- TI: Magnesium **absorption**: mechanisms and the influence of vitamin D, **calcium** and phosphate.
- TI: **Calcium** citrate markedly enhances aluminum **absorption** from aluminum hydroxide.
- TI: Determination of fractional **absorption** of dietary **calcium** in humans.
- TI: Oxalate: effect on **calcium** absorbability.



Here is one more example of a phrase, "pain management" where the words don't necessarily have to be adjacent:

- TI: **Pain** and symptom **management** clinical, policy, and political perspectives.
- TI: **Pain management** in palliative care--an update.
- TI: Knowledge and attitudes about cancer **pain management**: a national survey of Italian oncology nurses.
- TI: Pharmacologic **management** of adult cancer **pain**.
- TI: **Management** of **pain** in cancer patients with oral mucositis: follow-up of multiple doses of doxepin oral rinse.
- TI: Cannabinoids in cancer **pain management**.
- TI: Gabapentin and an opioid combination versus opioid alone for the **management** of neuropathic cancer **pain**: a randomized open trial.
- TI: Pharmacological **management** of cancer **pain** in the elderly.
- TI: Opioids for **management** of breakthrough **pain** in cancer patients.
- TI: Barriers to **pain management** in the rehabilitation of the surgical oncology patient.
- TI: **Pain management**, including intrathecal pumps.
- TI: The **management** of intractable **pain** in the cancer patient.
- TI: Knowledge of and barriers to **pain management** in caregivers of cancer patients receiving homecare.

Obviously, a word like management can have variant endings (*managing, managed*), which further complicates the problem:

- TI: Developing an integrated care pathway to **manage** cancer **pain** across primary, secondary and tertiary care.
- TI: **Managing** metastatic bone **pain**.
- TI: **Managing pain** at the end of life.
- TI: Intrathecal catheters with subcutaneous port systems in patients with severe cancer-related **pain managed** out of hospital: the risk of infection.

As you know by now, the word management is an idea, which can be represented by other words:

- TI: Principles of **control** of cancer **pain**.
- TI: Improving cancer patients' **pain**: the impact of the hospital specialist palliative care team.
- TI: Systemic radionuclide therapy in **pain** palliation.
- TI: **Pain control** in cancer: recent findings and trends.
- TI: Perceptions of **control** over **pain** by patients with cancer and their caregivers.
- TI: Effect of zoledronic acid on **pain** associated with bone metastasis in patients with prostate cancer.

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“Oh what a tangled web we weave, when first we practice to retrieve.”
(with apologies to Sir Walter Scott)

————— ❦ —————