



Dr. Fahad J. Siddiqui

Singapore Clinical Research Institute (SCRI)

Systematic Searching of e-literature Databases

Structure of the session



- Principles of searching
 - Resources
- Search Strategy
 - Developing
 - Implementing
 - Saving



1st principal of searching



- Start with focused clinical question
 - Specifies
 - Population to which the question applies;
 - Intervention or Exposure
 - Control treatment/exposure
 - Outcome variable

Formulate the question



- Translate the clinical problem into a structured question and identify the **key concepts**
 - *Is there a role of resuscitative drugs in out-of-hospital cardiac arrest in addition to cardiopulmonary resuscitation*
 - *Does epinephrine reduces mortality among patients experiencing out of hospital cardiac arrests receiving CPR?*

❖ *Does epinephrine reduces mortality among patients experiencing out of hospital cardiac arrests receiving CPR?*

Patient or problem	
Intervention(s)	
Comparison(s)	
Outcome(s)	

2nd principle of searching



- **Find as much as possible**
 - **Use multiple sources**
 - **Start with the sources with highest yield**
 - **Journal coverage**
 - **date coverage**
 - **Specialty coverage**
 - **Language coverage**

Resources e-databases



- **MEDLINE** (online records of Index Medicus, 1966 - , free on PubMed-Entrez)
- **EMBASE** (online records of Excerpta Medica, 1974 - , subscription)
- **CDSR** (*The Cochrane Library*)
- **CENTRAL** (*The Cochrane Library*)
- **CRG** specialist databases (Cochrane Reviewers)
- **Chinese Biomedical Literature database**
- **CINAHL** (Nursing & Allied Health, 1982 - , subscription)
- **CancerLit** (Cancer) http://www.cancer.gov/search/cancer_literature/
- **AIDSLINE**
- **SciSearch**
- **LILACS** (Latin America & Caribbean med lit, Portuguese & Spanish language, free) <http://www.bireme.br>
- **Australasian Medical Index** (subscription)
- **JICST-E** (Japan)
- **Specialist CAM** databases

Use Google to find the latest web addresses

Chinese databases



Name (English)	Name (Chinese)	Journals	Articles	Start date	Free access
Chinese Biomedical Literature database (CBM)	中国生物医学文献数据库	1600+	3 000 000	1978	No
Chinese Medical Current Content (CMCC)	中文生物医学期刊数据库	1400+	2 700 000	1994	Citations + abstracts
China National Knowledge Infrastructure (CHKD-CNKI)	国家知识基础设施	1000+	145457	1979	Citations + abstracts
VIP information/Chinese Scientific journals database (CSJD-VIP)	维普信息/中文科技期刊数据库	1818	2 900 000+	1989	Citations + abstracts
WANFANG database (Chinese Medicine Premier)	万方数据/医药卫生专辑	963	Unclear	Unclear	Citations + abstracts

Other Resources



- References of relevant articles & reviews
- Conference Proceedings
- Hand-searching un-indexed journals
- Contact pharmaceutical & device manufacturers
- Contact experts in the field

3rd principle of Searching



- **Search Systematically**
- **Two step process:**
 1. Identify search terms corresponding to the [PICO](#) concept
 1. MeSH* descriptors / terms (for MeSH search)
 2. free-text terms (for free-text search)
 2. Retrieve relevant citations
 - Boolean operators
 - Database search interface

*MeSH = *Medical Subject Heading*

- MeSH is the National Library of Medicine's controlled vocabulary thesaurus.
- It consists of sets of terms naming descriptors in a hierarchical structure that permits searching at various levels of specificity.

**Next few slides:
Not for Literature Searching!**

Exploring MeSH



http://www.nlm.nih.gov/cgi/mesh/2011/MB_cgi

MeSH Tree Structures - 2011



- 1. [A](#) Anatomy [20]
- 2. [B](#) Behavior [20]
- 3. [C](#) Chemistry [10]
- 4. [D](#) Diseases and Disorders [20]
- 5. [E](#) Evaluation, Diagnosis, and Management, Prevention and Epidemiology [20]
- 6. [F](#) Forensic and Pathology [20]
- 7. [G](#) Genetics and Heredity [10]
- 8. [H](#) Health Services, Education, Research, and Social Phenomena [20]
- 9. [I](#) Immunology, Infectious, Reproductive [10]
- 10. [J](#) Injuries [10]
- 11. [K](#) Measurement [10]
- 12. [L](#) Laboratory Systems [10]
- 13. [M](#) Medical History [10]
- 14. [N](#) Nutrition [10]
- 15. [O](#) Occupational, Environmental [10]
- 16. [P](#) Pharmacology [10]
- 17. [Q](#) Public Health, Administration [10]
- 18. [R](#) Radiology [10]

Exploring MeSH



1. Anatomy [A]
2. Organisms [B]
3. Diseases [C]
 - o [Bacterial Infections and Mycoses \[C01\]](#) +
 - o [Virus Diseases \[C02\]](#) +
 - o [Parasitic Diseases \[C03\]](#) +
 - o [Neoplasms \[C04\]](#) +
 - o [Musculoskeletal Diseases \[C05\]](#) +
 - o [Digestive System Diseases \[C06\]](#) +
 - o [Stomatognathic Diseases \[C07\]](#) +
 - o [Respiratory Tract Diseases \[C08\]](#) +
 - o [Otorhinolaryngologic Diseases \[C09\]](#) +
 - o [Nervous System Diseases \[C10\]](#) +
 - o [Eye Diseases \[C11\]](#) +
 - o [Male Urogenital Diseases \[C12\]](#) +
 - o [Female Urogenital Diseases and Pregnancy Complications \[C13\]](#) +
 - o [Cardiovascular Diseases \[C14\]](#) +
 - o [Hemic and Lymphatic Diseases \[C15\]](#) +
 - o [Congenital, Hereditary, and Neonatal Diseases and Abnormalities \[C16\]](#) +
 - o [Skin and Connective Tissue Diseases \[C17\]](#) +
 - o [Nutritional and Metabolic Diseases \[C18\]](#) +
 - o [Endocrine System Diseases \[C19\]](#) +
 - o [Immune System Diseases \[C20\]](#) +
 - o [Disorders of Environmental Origin \[C21\]](#) +
 - o [Animal Diseases \[C22\]](#) +
 - o [Pathological Conditions, Signs and Symptoms \[C23\]](#) +
 - o [Occupational Diseases \[C24\]](#) +
 - o [Substance-Related Disorders \[C25\]](#) +
 - o [Wounds and Injuries \[C26\]](#) +
4. Chemicals and Drugs [D]
5. Analytical, Diagnostic and Therapeutic Techniques and Equipment [E]

Exploring MeSH terms



► [Cardiovascular Diseases \[C14\]](#)

[Cardiovascular Abnormalities \[C14.240\] +](#)

[Cardiovascular Infections \[C14.260\] +](#)

[Heart Diseases \[C14.280\] +](#)

[Arrhythmias, Cardiac \[C14.280.067\] +](#)

[Carcinoid Heart Disease \[C14.280.104\]](#)

[Cardiac Output, High \[C14.280.142\]](#)

[Cardiac Output, Low \[C14.280.148\]](#)

[Cardiac Tamponade \[C14.280.155\]](#)

[Cardiomegaly \[C14.280.195\] +](#)

[Cardiomyopathies \[C14.280.238\] +](#)

[Endocarditis \[C14.280.282\] +](#)

[Heart Aneurysm \[C14.280.358\]](#)

► [Heart Arrest \[C14.280.383\]](#)

[Death, Sudden, Cardiac \[C14.280.383.220\]](#)

[Out-of-Hospital Cardiac Arrest \[C14.280.383.610\]](#)

[Heart Defects, Congenital \[C14.280.400\] +](#)

[Heart Failure \[C14.280.434\] +](#)

- Principles of searching ✓
 - Resources ✓
- Search Strategy
 - Developing ✓
 - Implementing
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Developing search strategy



- Identify closest matching MeSH descriptors (terms)
 - search the MeSH thesaurus
 - select MeSH term
- List relevant free-text terms
 - list all known synonyms
 - *cardiac arrest* → heart arrest, cardiopulmonary arrest
 - use truncation (*)
 - heart arrest* → heart arrests etc
- Do bibliographic search with free-text term(s)
 - “Out of hospital heart arrest”

1. Terms for key concepts



Item	Mesh term	Free text term
P	Out-of-hospital cardiac arrest	Out of hospital heart arrest, Out of hospital cardiac arrest, OHCA
P	Cardiopulmonary Resuscitation	CPR
I	Epinephrine	Adrenaline, adrenalin*
C	No preventive treatment	[Not recommended]
O	Mortality	[Not recommended]

2. Combining search terms

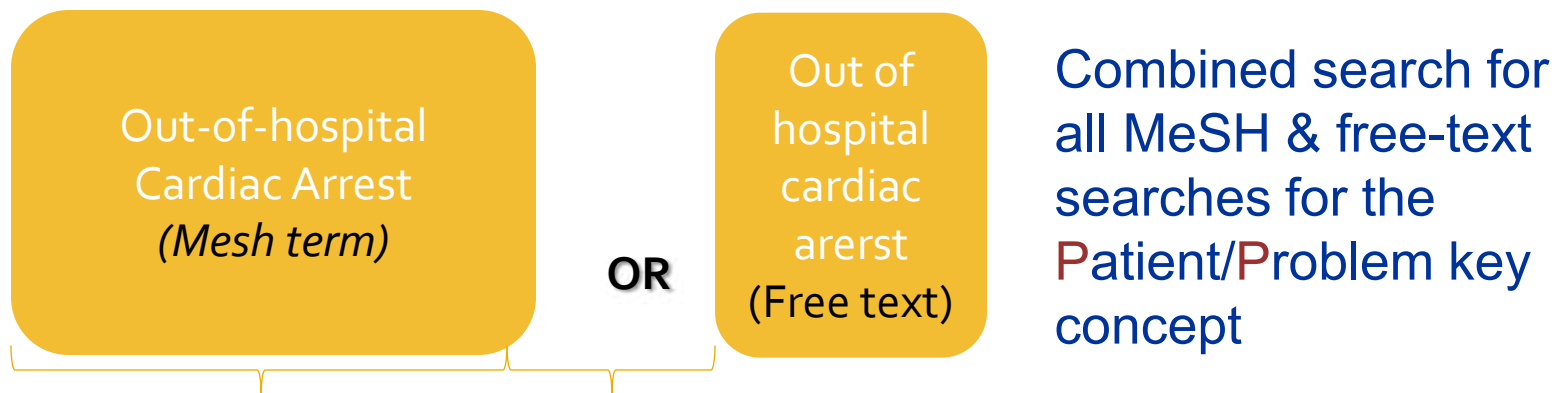


- Boolean operators
 - OR
 - Broadens the search
 - AND
 - Narrows the search
 - NOT
 - Refines the search

Search for P using OR



Patient/Problem (MeSH terms OR Free-text search)

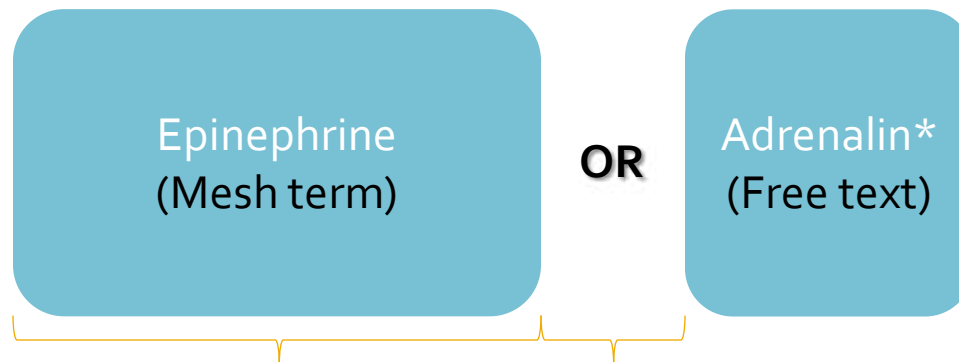


NB: **OR** is used in the **inclusive** sense i.e. A or B or both

Search for I using OR



Intervention (MeSH terms OR Free-text search)



Combined search for all MeSH & free-text searches for the Intervention key concept



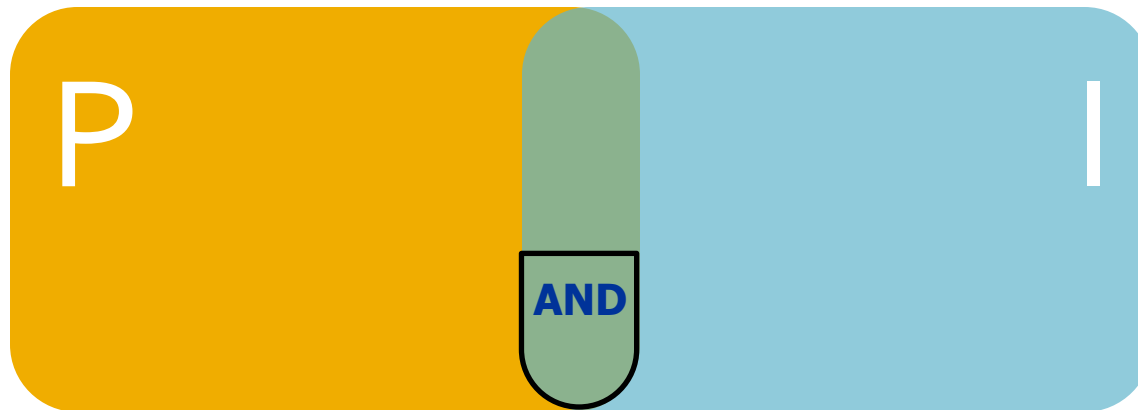
Combining P AND I searches

Out-of-hospital
Cardiac Arrest
OR
Out of hospital cardiac
arrest
(P)

AND

Epinephrine
OR
Adrenalin*
(I)

Limit: by study design



Publication types
e.g. RCTs

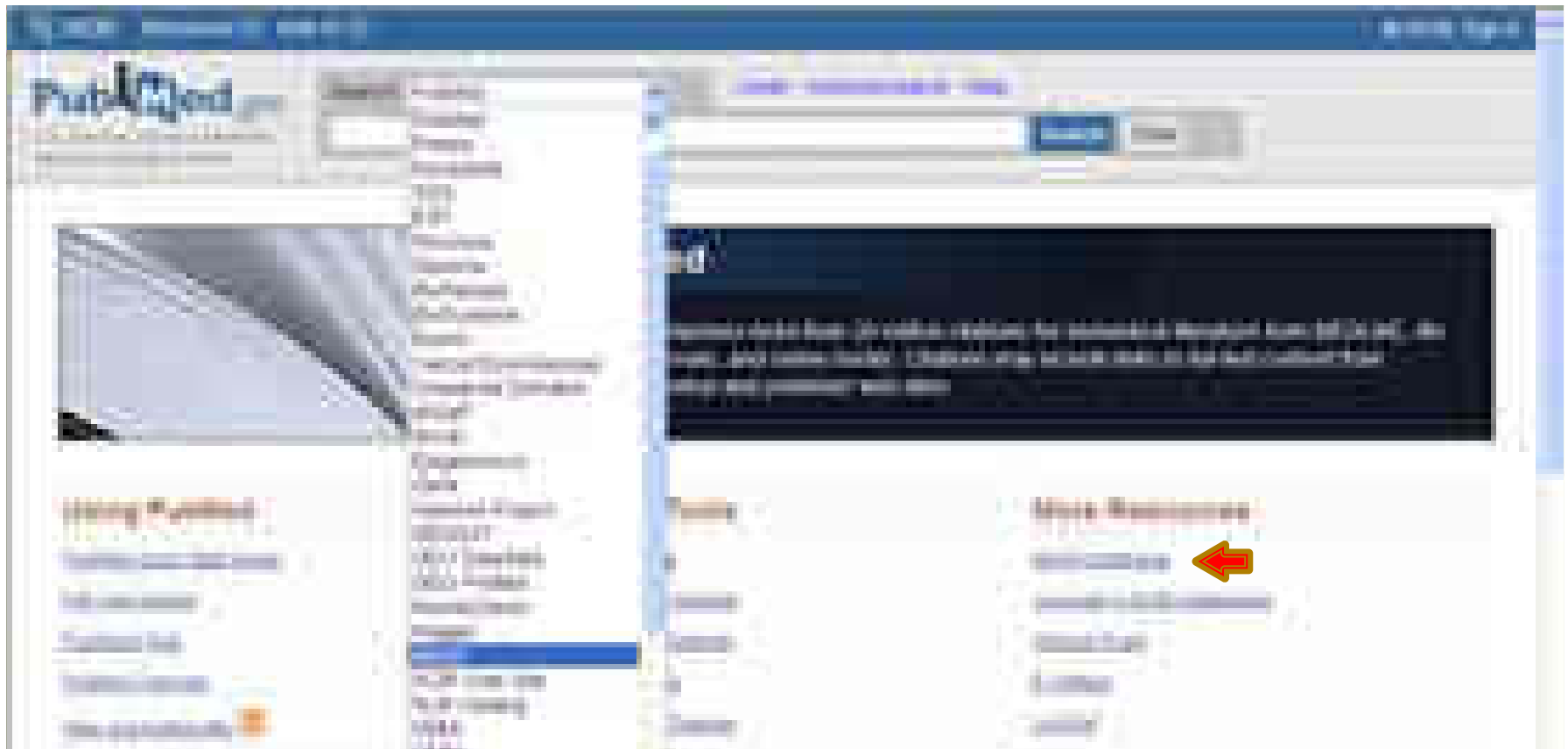
- Principles of searching ✓
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MeSH thesaurus search in MEDLINE (PubMed)



www.ncbi.nlm.nih.gov or search 'PubMed' through Google®



Identifying MeSH term

A screenshot of the MeSH (Medical Subject Headings) website interface. The page has a blue header with navigation links. Below the header is a search bar with a search button. A callout box, consisting of a blue circle around the search button and a line pointing to a text box below, highlights the search button. The text box contains the following text:

To start a search of the MeSH Thesaurus (not a search of the MEDLINE bibliographic database)

Selecting MeSH term



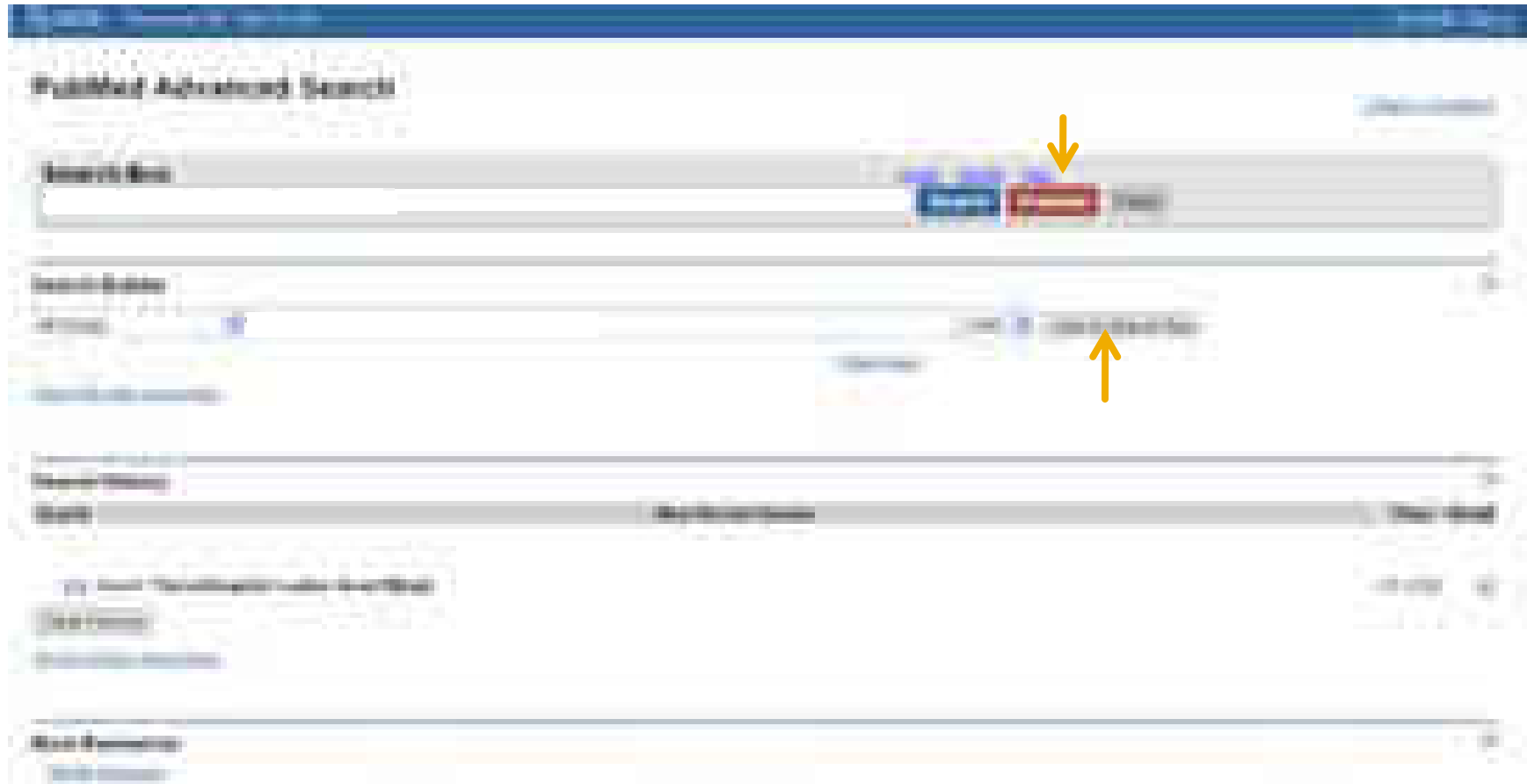
A screenshot of the MeSH (Medical Subject Headings) browser interface. The main search area contains the text "Out-of-Hospital Cardiac Arrest", which is circled in red. A yellow arrow points from the search input field to this circled text. On the right side of the interface, a list of search results is displayed, with the top result being "Out-of-Hospital Cardiac Arrest" [Majr]. Two yellow arrows point from the main search area towards this result. The interface includes a search bar at the top, a list of search results on the right, and a detailed view of the selected term at the bottom.

From MeSh to Free Text

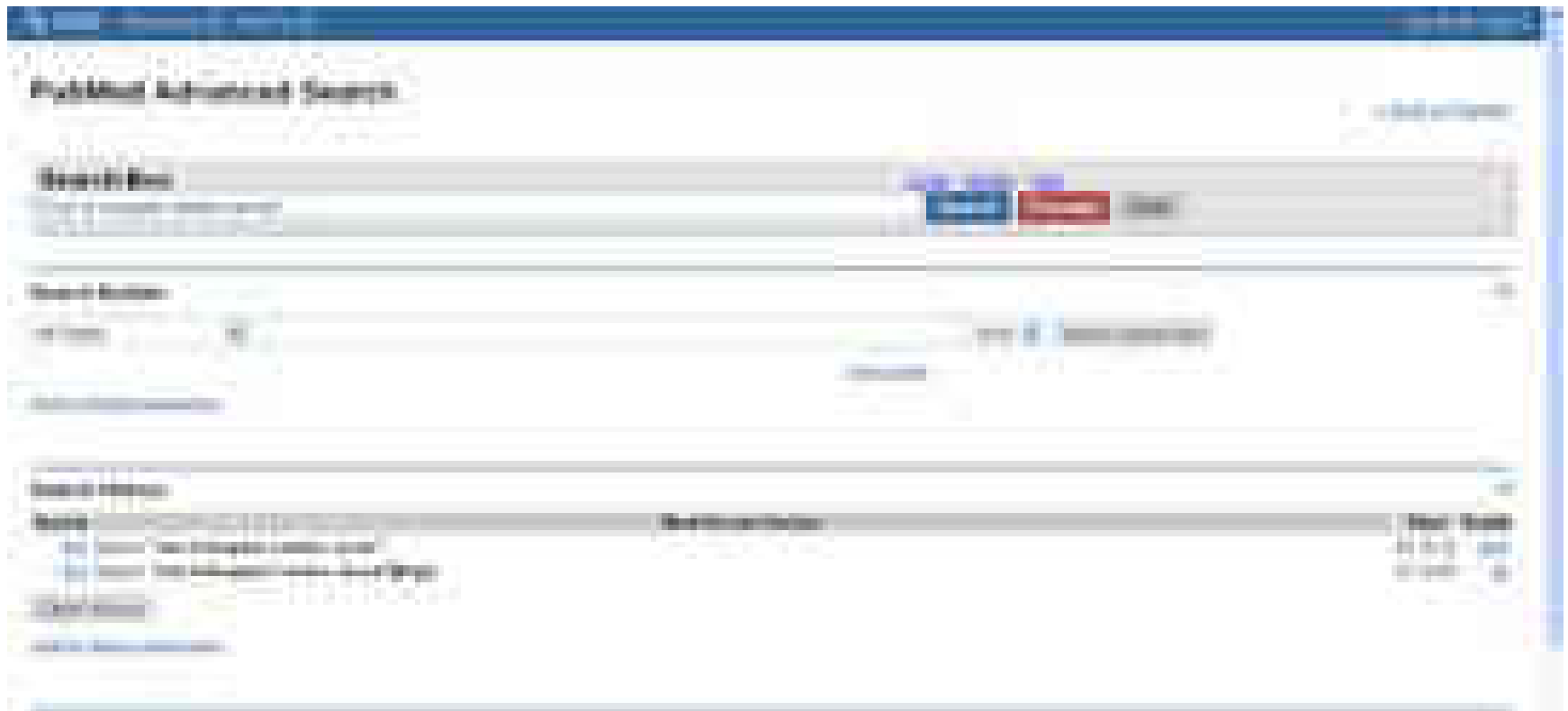


A screenshot of a search engine interface, likely PubMed, showing search results. Two red circles highlight specific elements: one circle is around a search bar or filter option at the top, and the other is around a search result entry in the main list. The interface includes a search bar, navigation tabs, and a list of search results with titles and abstracts.

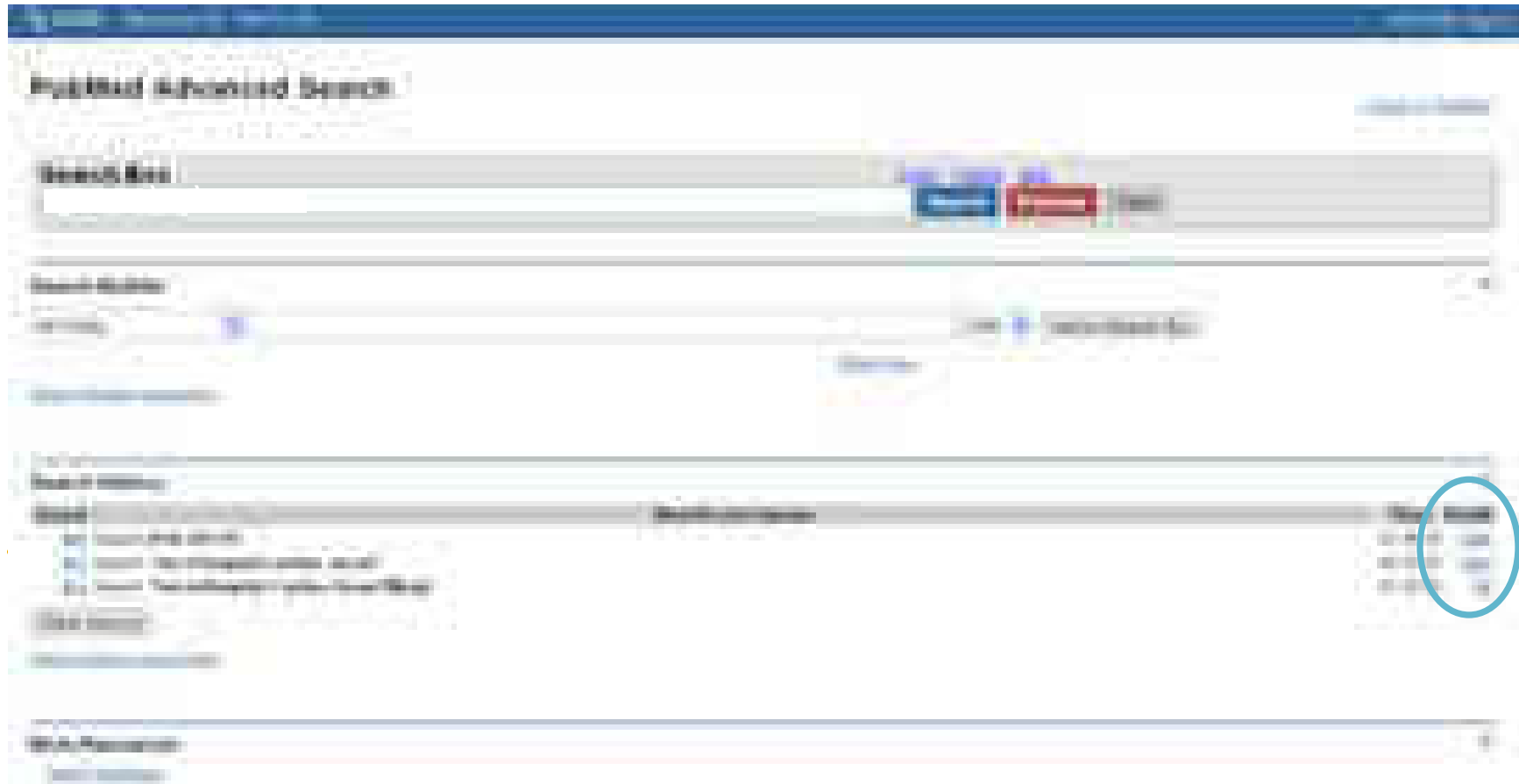
Free-text terms search



Free-text terms search



Combining terms using 'OR'



Searching fruther...



A screenshot of a search engine interface, likely PubMed, showing a search bar, navigation tabs, and a list of search results. The interface is somewhat blurry but clearly shows the search process and the resulting list of items.

Searching for I



A screenshot of the PubMed Advanced Search interface. The page has a blue header with the text "PubMed Advanced Search" and "100,000,000". Below the header, there are several search input fields and buttons. A yellow callout box with a vertical line points to a search result entry in the "Search Results" section. The entry is for the letter "I" and is highlighted with a yellow box. The callout box is a yellow circle with a vertical line inside, and a yellow line connects it to the search result entry. The search results table has columns for "Search Results" and "Full Text".

Searching for P



The screenshot shows a search engine interface with a search bar at the top. Below the search bar, there are several search results. A yellow circle containing the letter 'P' is positioned over one of the search results, with a yellow arrow pointing to it. The search results are displayed in a table format with columns for title, URL, and other details. The interface is in a light blue and white color scheme.

Getting search finalized



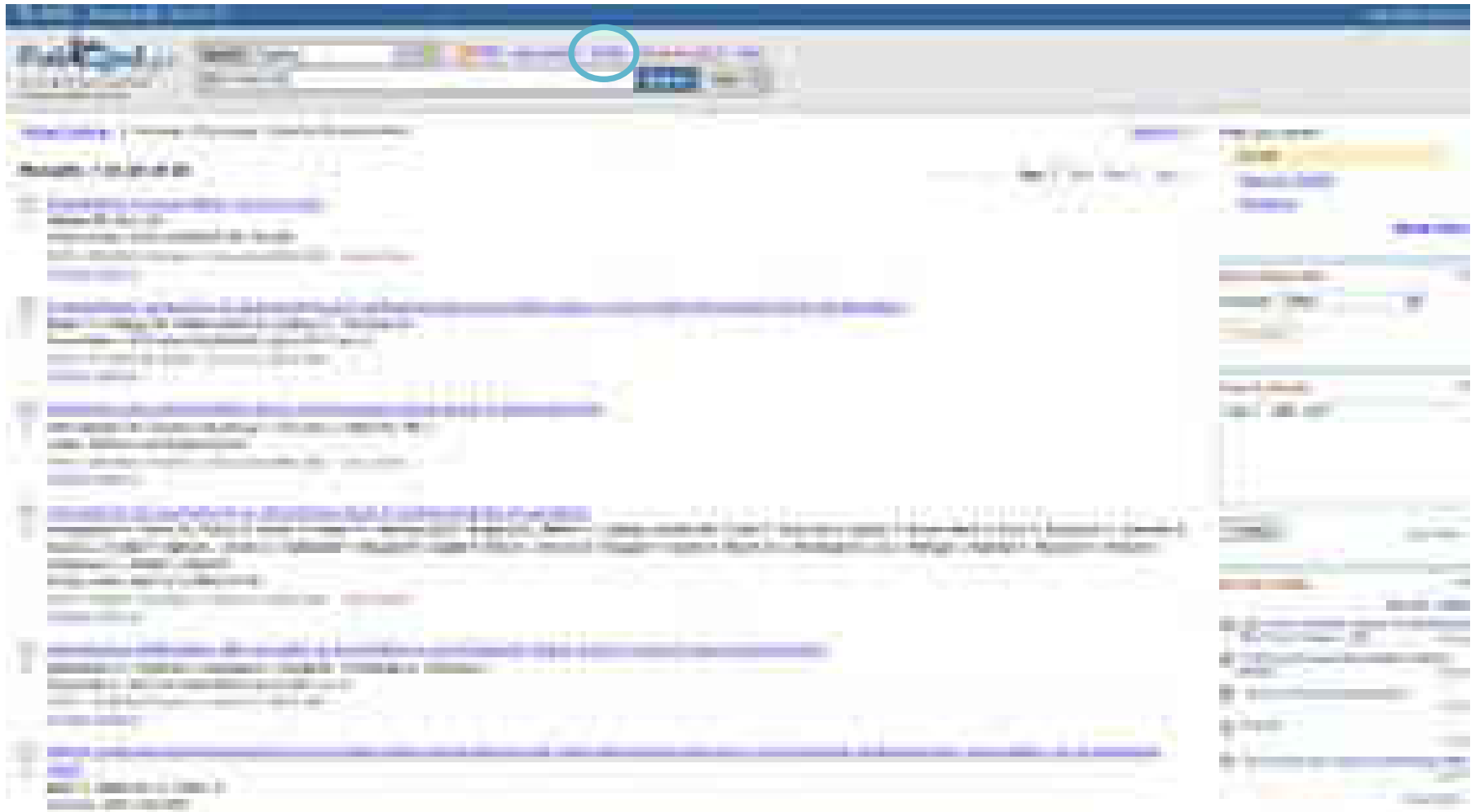
A screenshot of a search engine interface, likely PAROS, showing a search results page. The interface includes a search bar at the top, a list of search results, and a sidebar on the right. Three yellow circles with letters 'I', 'P', and 'FI' are overlaid on the page. Lines connect these circles to specific elements: 'I' points to a search result, 'P' points to another search result, and 'FI' points to a filter or facet option in the sidebar. A yellow arrow on the right points towards the sidebar area.

Results



A screenshot of a search results page, likely from a library or academic database. The page is heavily blurred, but several search results are visible. Each result appears to have a title, a brief description, and a link. The results are arranged in a list format. The text is mostly illegible due to the low resolution and blurring.

Applying Limits



Applying limits



PAROS

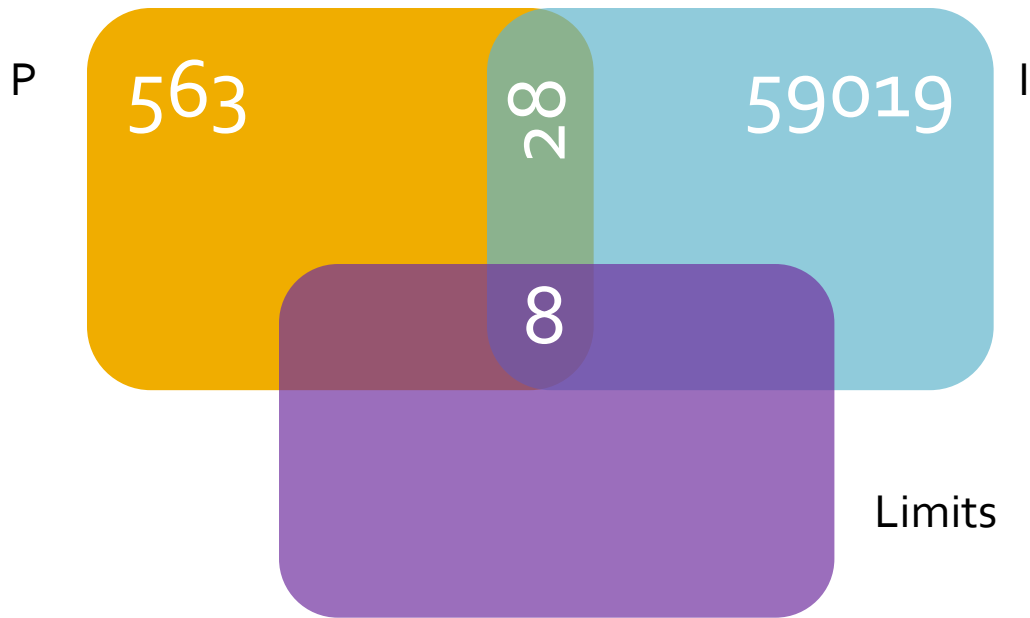
A screenshot of a search interface, likely a library catalog or search engine. The interface is divided into several sections. On the left, there are two blue circles highlighting specific elements. On the right, there is a single blue circle highlighting an element. At the bottom center, there is a yellow arrow pointing to a button labeled "Apply". The interface includes various search filters and options, such as "All Fields", "Advanced Search", and "Advanced Search".

Result of limit search



A screenshot of a search results page from a digital library. The page has a blue header with the 'PAROS' logo and a search bar. Below the header, there are several search results listed. Two blue circles are drawn on the page: one on the left highlights a search result entry, and one on the right highlights a filter or facet option. The text in the image is somewhat blurry, but the layout is typical of a search results interface.

Combining P, I & Limits



A screenshot of a software interface, likely a database or reporting tool, showing a list of items. The interface is partially obscured by a large, semi-transparent watermark that reads 'PAROS' in a large, stylized font. The list contains several rows of data, with columns for item names and numerical values. The text is mostly illegible due to the watermark and low resolution.

Additional points



- no right time to stop searching; be guided by returns and resources
- ideas for search terms from citations you know of; try them and check returns
- use a referencing database to manage citations

Minimize bias



- Don't limit search on
 - language
 - source (which journal, database etc)
 - publication status (full article, conference abstract, unpublished etc)
 - publication date



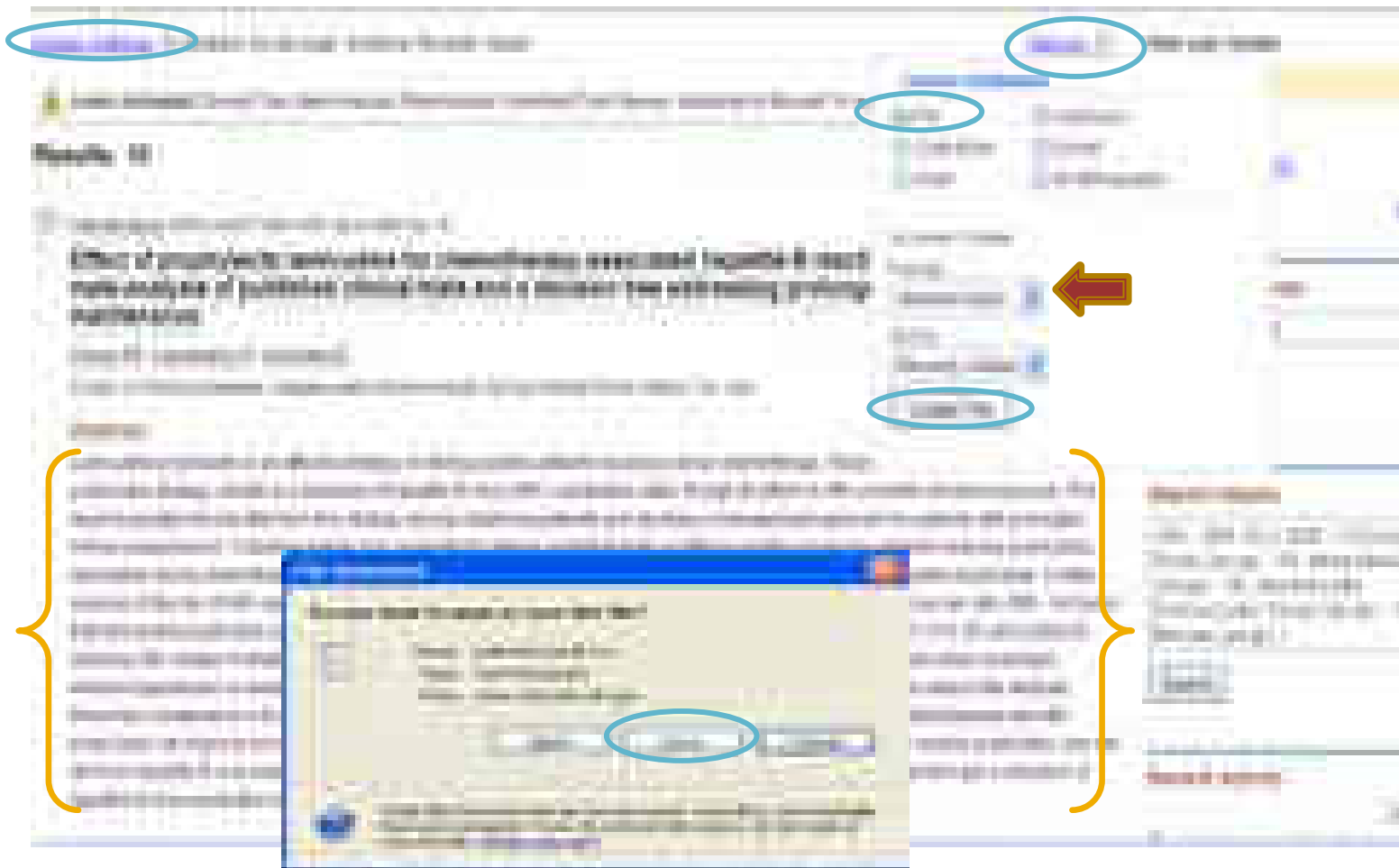
Saving your results!



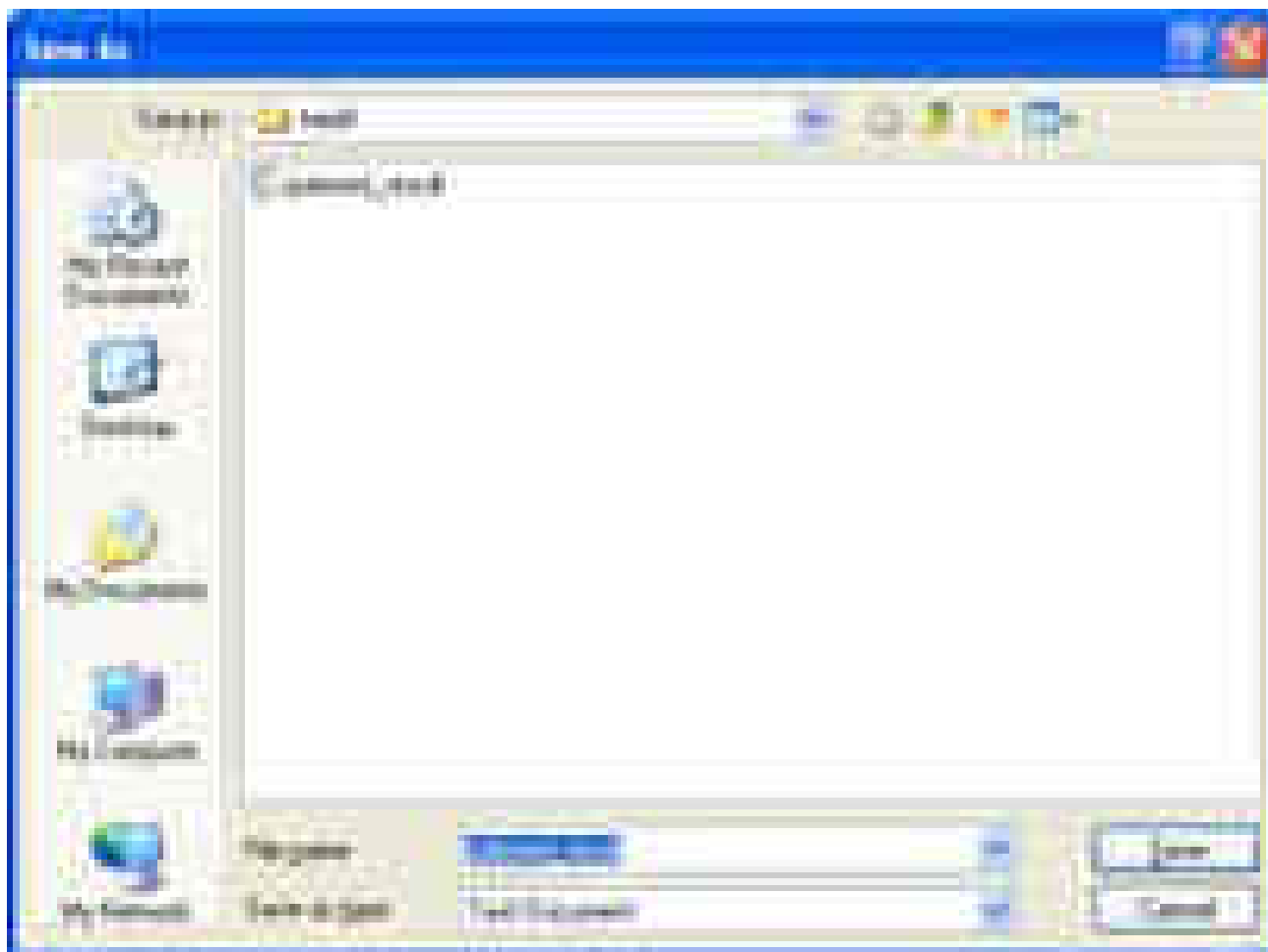
Changing the record Display...



Send to file



SAVE



Saved Results



Thank You!

