

# Medical information: Where to find it, what to trust

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# Presentation structure

- The problem
- The question
- +Use Google ~better
- Trust and trust proxies
- Medline
- The power of MeSH
- Limitations of Medline
- Summary

## What this presentation is not

This is not a masterclass in critical appraisal skills

To improve your critical appraisal skills read  
How to Read a Paper: The Basics of Evidence Based  
Medicine

Greenhalgh T

(all available online and free at <http://www.bmj.com/>)

## The problem (i)

“The Internet is a veritable bouillabaisse for finding information, with a huge and outrageously expanding pot, and you never know when you stick your fork in what tasty morsel or bit of fish debris you will stab.”

Sackett et al. 1997

# The problem (ii)

Google

breast cancer

Search

SafeSearch off ▼

About 85,600,000 results (0.21 seconds)

Advanced search

**Everything**

News

Videos

More

**The web**

Pages from the UK

**Any time**

Latest

Past 2 days

**Standard view**

Wonder wheel

More search tools

**Breast Cancer Information**

CancerHelp.org.uk/BreastCancer  
& treatment.

**Breast cancer** info: signs, risks, symptoms, detection

Sponsored links

**Breast Cancer Scan**

www.BreastHealthUK.com

**Breast cancer** detection services Caring clinics across UK

Don't wait

**News for breast cancer**



[Martina Navratilova speaks of breast cancer battle](#) - 6 hours ago

Tennis legend Martina Navratilova said she was more "grateful" than ever for her life after beating **breast cancer** and revealed she was still looking for ...

Telegraph.co.uk - 65 related articles

[Rob Ford joins mother in cancer fundraiser](#) -

National Post - 607 related articles

[Don't ignore signs of breast cancer](#) - Times of India - 200 related articles

**Breast Cancer Care - Support and information for anyone affected ...**

UK charity provides patient support. Includes information, online discussion forums, donation procedures and contact details.

Sponsored links

**Calculate Breast Cancer**

Tumor Volume using 3D imaging  
Non-invasive and Longitudinal  
www.VisualSonics.com

**Breast Cancer Claim**

**Breast Cancer** Misdiagnosis or I  
In Treatment? Start Your Claim N  
www.DarbysMedicalNegligence.c

**Breast Cancer**

Diagnostics and treatment of can  
Modern Cancer Hospital LISSOC  
www.lissod.com.ua

**Help Beat Breast Cancer**

**Breast Cancer** is the most comr  
Cancer in the UK. Donate now.  
www.Breakthrough.org.uk/beat

## The problem (iii)

Google™

breast cancer Her2

Search

[Advanced Search](#)

[Preferences](#)

Web

Results 1 - 10 of about **1,150,000** for [breast cancer Her2](#). (0.25 s)

### [HER2-positive breast cancer: What is it? - MayoClinic.com](#)

HER2-positive **breast cancer** tends to be more aggressive than other types of **breast cancer**.

[www.mayoclinic.com/health/breast-cancer/AN00495](http://www.mayoclinic.com/health/breast-cancer/AN00495) - 26k -

[Cached](#) - [Similar pages](#) - [Note this](#)

### [HER2 testing and breast cancer : Cancerbackup](#)

Information about HER2 testing and **breast cancer**. ... Some **breast cancer** cells have a lot more HER2 receptors than others. In this case, the tumour is ...

[www.cancerbackup.org.uk/Cancertype/Breast/Causesdiagnosis/HER2testing](http://www.cancerbackup.org.uk/Cancertype/Breast/Causesdiagnosis/HER2testing) - 44k -

[Cached](#) - [Similar pages](#) - [Note this](#)

Genentech Medicines: **HER2** Disease

Sponsored Links

### [Survive Breast Cancer](#)

11 steps to winning the battle against **breast cancer**.

[www.CancerFightingStrategies.com](http://www.CancerFightingStrategies.com)

### [HER2 Protein Inhibitor](#)

HCPs read news about treating HER2 overexpression. Free online info

[www.GSKoncology.eu](http://www.GSKoncology.eu)

## The question

“There are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns - the ones we don't know we don't know.”

Rumsfeld 2002

# Ask answerable questions

We are stuck with the known knowns, so

- What is most important to my patient?
- What can I feasibly answer?
- What question is most interesting to me?
- Is this relevant to my wider practice?

## +Use Google ~better

To learn how to use Google better see tutorials at:

<http://www.googleguide.com/>

<http://www.googletutor.com/>

Bookmark this page

<http://www.googleguide.com/cheatsheet.html>

## Trust (i)



Dear valued customer of TrustedBank,

We have received notice that you have recently attempted to withdraw the following amount from your checking account while in another country: \$135.25.

If this information is not correct, someone unknown may have access to your account. As a safety measure, please visit our website via the link below to verify your personal information:

<http://www.trustedbank.com/general/custverifyinfo.asp>

Once you have done this, our fraud department will work to resolve this discrepancy. We are happy you have chosen us to do business with.

Thank you,  
TrustedBank

Member FDIC © 2005 TrustedBank, Inc.

[en.wikipedia.org/wiki/Phishing](http://en.wikipedia.org/wiki/Phishing)

## Trust (ii)

1. Trust evolved to be personal and local
2. Internet trust is often personal and global
3. Where trust is not personal we look for proxies
4. Trust is not about truth; it's about whether the materials are presented in good faith

# Trust proxies

## Customer Reviews

**5 Reviews**

5 star:		(4)
4 star:		(1)
3 star:		(0)
2 star:		(0)
1 star:		(0)

**Average Customer Review**  
★★★★★ (5 customer reviews)

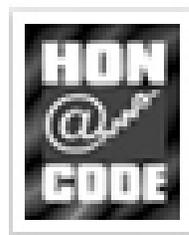
### Most Helpful Customer Reviews

17 of 17 people found the following review helpful:

★★★★★ **excellent guide**, 11 Mar 2005

By **CM AK Bentley "a k bentley"** (UK) - [See All My Reviews](#)

This review is from: **How to Read a Paper: The Basics of Evidence Based Medicine (Paperback)**



## What is Medline?

- Main bibliographic database of the US NLM
- Covers medicine, nursing, dentistry, veterinary medicine, healthcare systems, and preclinical sciences
- Contains over 13 million citations and author abstracts from more than 5000 biomedical journals
- These come from the US and over 70 other countries and date back to the 1960s
- BUT records are mainly from English-language sources or have English abstracts
- Updated weekly

## Medline citations

- Title of the journal article
- Names of the authors
- Abstract published with the article
- Controlled Vocabulary Search Terms (MeSH headings)
- Journal Source Information
- First Author Affiliation
- Language in which the article was published
- Publication Type (description of the type of article, e.g., Review, Letter, etc.)

## The power of Medline

Supplementary indexing created by the indexing staff of the NLM

- Including
  - Publication types
  - Medical Subject Headings (MeSH) - each citation receives 5-25 (usually 3 major)
  - Subheadings - indexers can add around 90 possible subheadings to MeSH terms to facilitate searches

- There are over 19000 MeSH terms arranged hierarchically within the MeSH Tree Structure
- Effectively keywords they give Medline uniformity and consistency
- 15 principal parent MeSH term branches
- MeSH terms are revised annually

# 15 branches of MeSH

- A. Anatomy**
- B. Organisms**
- C. Diseases**
- D. Chemicals and Drugs**
- E. Analytical, Diagnostic and Therapeutic Techniques and Equipment**
- F. Psychiatry and Psychology**
- G. Biological Sciences**
- H. Physical Sciences**
- I. Anthropology, Education, Sociology and Social Phenomena**
- J. Technology and Food and Beverages**
- K. Humanities**
- L. Information Science**
- M. Persons**
- N. Health Care**
- Z. Geographic Locations**

## MeSH is hierarchical

Breast cancer is not a MeSH term

- C. Diseases
  - C04 Neoplasms
    - C04.588 Neoplasms by site
      - C04.588.180 Breast neoplasms [Breast cancer finds]
        - » C04.588.180.260 Breast neoplasms, male
        - » C04.588.180.520 Mammary neoplasms
        - » C04.588.180.525 Mammary neoplasms, experimental
        - » C04.588.180.762 Phyllodes tumour

## Exploding a Medline search

- Means that all records for terms beneath your search term in the tree structure will be found
- Some Medline tools, such as PubMed do this automatically
- Therefore, having some knowledge of the tree structure will improve your searching
- See <http://www.nlm.nih.gov/mesh/MBrowser.html>

## Too lazy to learn?

- Try “bootstrapping”
  - If you know a key article in the field find it
  - Check its MeSH terms
  - Search those

This is effectively what the “Related Article” function in PubMed does

# Medline searches use Boolean logic

- George Boole was a 19th century English mathematician
- Described logic in algebraic terms
- Formalised what we today call Boolean logic
  - **AND**
  - **OR**
  - **NOT**

See [http://www.nlm.nih.gov/bsd/disted/pubmedtutorial/020\\_350.html](http://www.nlm.nih.gov/bsd/disted/pubmedtutorial/020_350.html)

## All Medlines are not the same

<b>Name</b>	<b>Span</b>	<b>Registration required?</b>	<b>Free?</b>
<u>PubMed</u>	???	No	Yes
<u>Internet Grateful Med</u>	1966-	No	Yes
<u>HealthGate</u>	1966-	No	Yes
<u>Infotrieve</u>	1966-	No	Yes
<u>Snooz</u>	???	No	Yes
<u>HealthWorks</u>	1966-	Yes	Yes
<u>MedScape</u>	1960-	Yes	Yes
<u>WebMedline</u>	???	Yes	Yes
<u>OVID</u>	1966-	Yes	No
<u>Community of Science</u>	1966-	Yes	No
<u>Paperchase</u>	???	Yes	No
<u>MedLine Pro</u>	1966-	Yes	No
<u>Chest Ovid Biomedical Service</u>	1966-	Yes	No
<u>BioMedNet Evaluated Medline</u>	1966-	Yes	Yes

## Pubmed is more than just Medline

- Healthstar - a database of literature on health services, technology, administration and research
- Premedline - Medline data that is awaiting indexing “[MEDLINE record in process]”
- Publisher - Supplied Citations - citations to journals only selectively indexed in Medline
- LinkOut - to (free) full-text articles, sequence data, etc.
- Books

## Clinical queries

- Pubmed has built-in clinical filters (based on Haynes et al. 1994)
- Allows searching in four separate study categories
  - therapy
  - diagnosis
  - etiology
  - prognosis
- Not comprehensive - “therapy” is mainly drug therapy - best for adult general medicine

# Medline shortcomings

- Not comprehensive
  - Medline misses around 50% of published trials
- US journals and English language bias
- Absence of other data sources, congress abstracts, etc.
- MeSH is a subject-oriented indexing system

## Medline tips

- Identify key concepts
- Determine alternative terms for these concepts, if necessary
- Understand how MeSH works
- Refine your search by combining terms AND/OR using limits
- Understand how your software works
- Practice
- Be aware of limitations and other resources

<http://www.nlm.nih.gov/bsd/disted/pubmedtutorial/>

# Summary

To find and select the best medical information

- Understand that the available info is vast...
- But not always helpful: Ask answerable questions
- Understand how your search system works
- Be clear about what information sources you will trust
- Caveat lector – your patient is your responsibility