



**EAHIL** European Association for Health Information and Libraries

# Retrieving Medical Information from Free and Reliable Sources

Presented by

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*EAHIL July 5, 2011 Istanbul*

- ▶ **Aim of This Seminar... to**
  - Highlight importance of Information Literacy;
  - Understand basic common search techniques;
  - Explore reliable free scholarly resources;
  - Become an better PubMed searcher;
  - Provide an introduction to EBM;
  - Provide tips on effective Googling!

## ► **Information Literacy**

It is knowing when and why you need info, where to find it, how to evaluate it, use & communicate it in an ethical manner.

This implies skills like understanding the:

- need for information;
- resources available & how to search them;
- how to evaluate results;
- how to work with results;
- ethics / responsibility of use;
- how to communicate findings.

## ► Information Attributes

Information must have 3 attributes to make it useful;

Usefulness of information:

Relevancy x Validity

Work

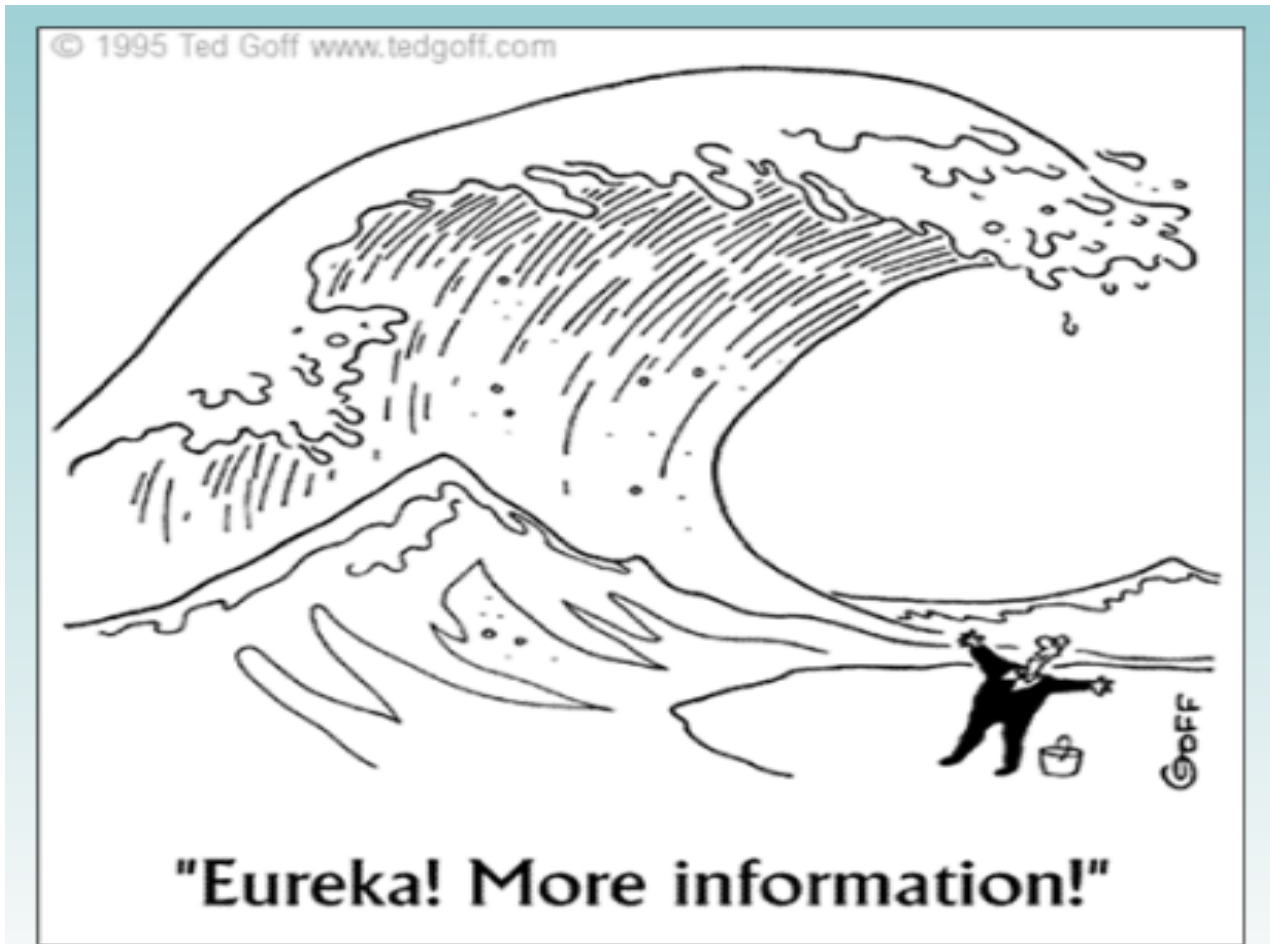
***High cost of *not* finding information***

## ▶ Do You Really Need This?

"Half of what you are taught as medical students will in 10 years have been shown to be wrong. And the trouble is none of your teachers knows which half"

Dr. Sydney Burwell

# Tsunami of Information...



- Medical literature doubles every 7 years.

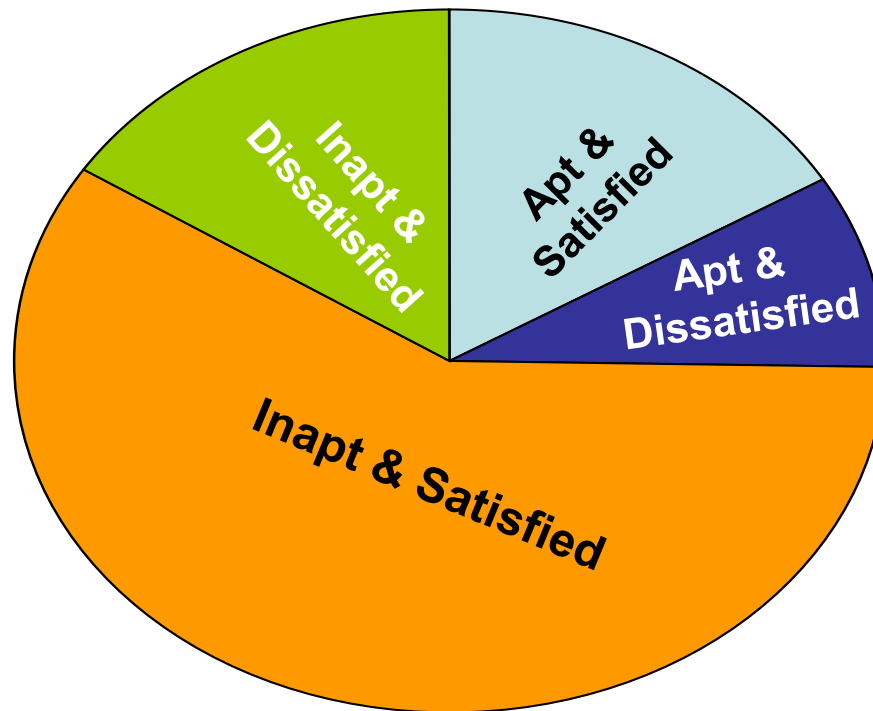
- 6500 medical articles are published daily.

- 1800 article PubMed/day.

*"Medical Libraries Save Lives, Time & Cost!"*

- ▶ **Still we see these Common Myths...**
  - *Everything is available for Free on the Internet;*
  - *Google is a good replacement for Library resources;*
  - *Today's Healthcare Professionals are Savvy Information Searchers;*
  - *When info is not located it is assumed it does not exist...*

## ► Users Categories





## ► **Basic Search Options**

- Boolean;
- Truncation & Wildcard;
- Use + or – ;
- Stemming;
- Proximity search;
- Search in specific fields;
- Natural language Search;
- “Phrase search”;
- Concept search;
- Simple vs. advanced search modes;
- Stop-words ignored when searching;
- Search multiple databases: advantages & disadvantages...

## **Broadening vs. Narrowing Results**

## ► Types of Clinical Questions

### Background Questions:

Asked for general knowledge (or facts) about a topic;  
usually it involves *who, what, when, why, where* or *how*.

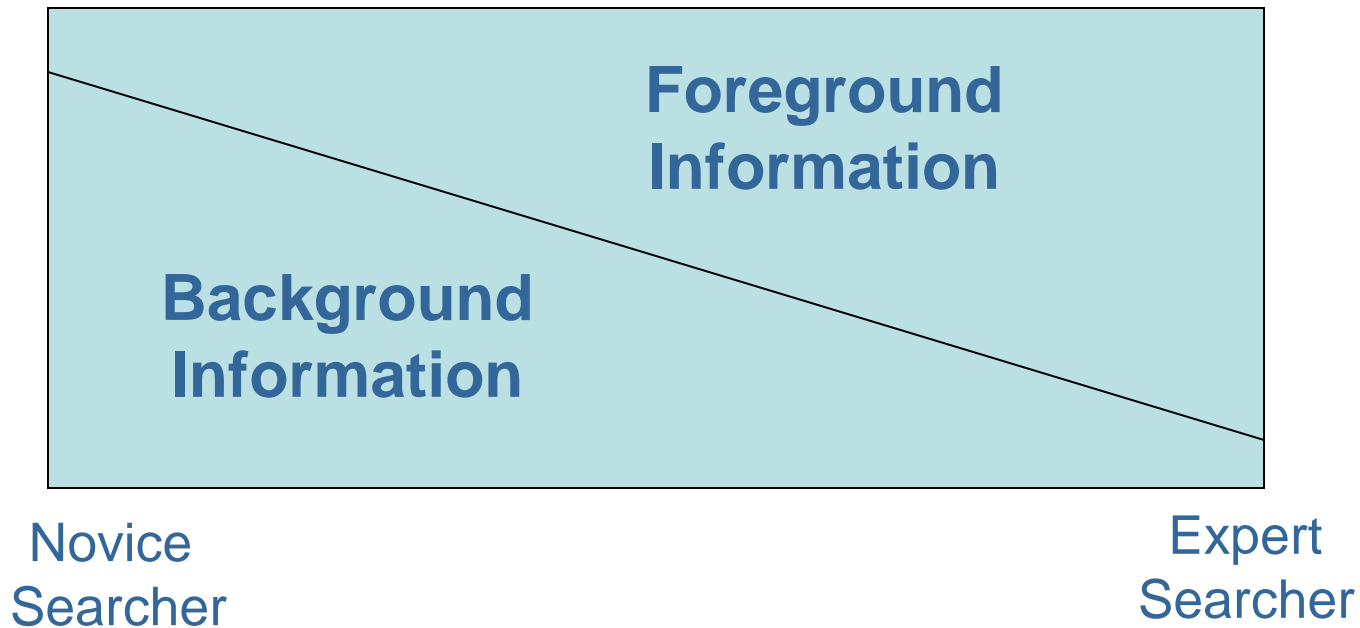
Foundation on which to base the practice of medicine:  
pathophysiology, pathology, pharmacology...

### Foreground Questions:

Asked for specific knowledge about managing patients with  
a disorder, are more detailed and focused;

Addresses relation between a patient(s), intervention,  
comparison and outcome...

# Foreground vs. Background





# PubMed & Beyond

► **PubMed (<http://pubmed.gov>)**

Indexes 5500 international journals, plus e-books:

- Goes back to 1944 [1840]
- Medline, plus dental, nursing, history, complimentary medicine...
- Uses controlled vocabulary
- PubMed Central (800 e-journals)
- E-Books (780 books & reports)

## ► MeSH Tree-Structure

### CARDIOVASCULAR DISEASES

- Heart diseases
  - Heart arrest
  - Endocarditis
  - Arrhythmias, cardiac
    - atrial fibrillations
    - bradycardia
  - Heart failure
  - Heart rupture
  - Myocardial ischemia
    - Myocardial infarction
    - Angina pectoris
- Vascular diseases
  - Hypertension
  - Varicose veins
  - Cerebrovascular disorders
    - stroke

## ► PubMed Alternative Interfaces

### AskMEDLINE

<http://askmedline.nlm.nih.gov>

### HubMed

<http://www.hubmed.org/>

### Index Cat

<http://www.indexcat.nlm.nih.gov>

## ► **Beyond PubMed Free Resources...**

In addition to GoogleScholar

- TOXNET
- SCIRUS
- POPLINE
- Global Health Library
- MedGrab...



## ▶ NIH Free Resources

### NCBI Images

<http://www.ncbi.nlm.nih.gov/images>

### Drug Information Portal

<http://druginfo.nlm.nih.gov>

### NLM Style Guide for Authors

<http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=citmed>

## ► **Open Access (OA)**

immediate permanent free online access to full-text peer-reviewed documents:

- Green OA: IR, PubMedCentral
- Gold OA: BMC, PLoS...
- Hybrid Journals ex. Springer publications.

## ► Open Access Resources

**DOAJ**            <http://www.doaj.org>

**Highwire**        <http://highwire.stanford.edu>

**Open J-Gate**    <http://www.openj-gate.com>

**PQDT Open Dissertation/Thesis**

<http://pqdtopen.proquest.com/about.html>

**F1000 Posters**

<http://posters.f1000.com/Index>

## ► **INTERNET OVERVIEW**

“Information Superhighway”

Network of independent computer networks, public & private, connecting millions of computers

Appeared in 1969 as an experimental network by US Dept. Defense

Later used by universities, now it links universities, companies, associations, libraries, institutions and home-users...

## ▶ **Electronic Mail (e-mail)**

structure of e-mails: userid@domain

subdomains separated by a dot

com=commercial

edu=educational

gov=governmental

mil=military

org=non profit organization

Country domains outside USA identified by 2 letter codes.

*E-mail Finders:*

*Internet Address Finder* <http://www.iaf.net>

## ▶ **E-mail Issues**

### **Benefits of e-mail**

- overcomes problems faced with telephone;
- faster and cheaper than classical mail;
- data kept in computer form;
- send to more than one address;
- allows subscription to listserv.

### **Problems of e-mail**

- requires infrastructure requirements;
- contact person should have e-mail address;
- you should know e-mail of contact person.

## ► **LISTSERVS**

Electronic mailing lists allow users to communicate with others in a particular field of interest by receiving e-mails;

Easy & effective way of communication with peers who share same interests or profession;

Search for Listservs:

<http://www.lsoft.com/catalist.html>

## ► Emoticons or Smilies

- series of letters, punctuation marks that sketch a facial expression;
- read by tilting head to left;
- used to overcome impersonal nature of e-medium:

:D laughing  
:-@ screaming  
:( frowning  
:\*\*: remote kissing  
:/) not funny

:-) happy  
:-o surprised  
;-) winking  
:-( sad  
:-& tongue tied



## ► **NETIQUETTE**

Internet etiquette, a set of rules of behavior expected from net users

Keep voice down; typing in capital letters is like screaming in cyberspace

To emphasize something place \* around text

Read FAQ before sending messages to mailing list, make them short

Abbreviations:

**btw** by the way

**fyi** for your information

**imho** in my humble opinion

**tia** thanks in advance

## ► **World Wide Web**

Largest / most popular user friendly multimedia interface, introduced 1992;

Uniform Resource Locator (URL);

Web, world's largest library (library without walls, library without librarians), has billions of sites, and number is growing exponentially.

- ▶ **Types of Internet Search Tools**
  - Keyword Search Engines... **Google**
  - Subject arranged directories... **Yahoo**
  - Meta-search engines... **Clusty**
  - Evaluated Medical Subject Directories...  
**Hardin Meta Directory.**
  - Deep Web... **Mednar**
  - Image search engines... **Corbis**
  - Natural-language search... **Ask**
  - Site Search... **WHO**

## ► **Tips on Internet Searching**

- most sites allow Boolean operators, read FAQ, help...
- find a word in current web page...
- bookmarks / favourites ...
- if not satisfied, rephrase the query, try a second, or a meta-search engine;
- word order is critical in Web searching;
- shorten a URL if you get a broken link;
- cached in Google...

## ► **Evaluating Internet Resources**

- Anyone can publish on Web;
- Ranges from the very good to very bad (inaccurate, biased, shallow, out of date);
- Information evaluation is an art that gets better with experience.
- Sometimes it helps to do a link: search in Google, or to try to find the site in a reputable directory.

## ► **Criteria for Evaluating Websites...(1)**

### **Authority**

- Is author clearly identified? / Are author's credentials listed?
- Is there an institutional affiliation?
- Does author have standing in the field?
- Is contact address listed?

### **Accuracy**

- Is the information accurate?
- Does site offer list of resources?
- Is the source of info clearly stated?

### **Objectivity**

- Is the purpose of the site clearly stated?
- Is the information impartially presented?
- Is sponsorship acknowledged?

## ► **Criteria for Evaluating Websites...(2)**

### Coverage

Does the site satisfy the needs of its intended audience?  
Is the subject coverage comprehensive?

### Currency

Is the site current?  
Was the site updated recently?  
Are the links kept up-to-date?

### Design

Is the site clearly designed?  
Is there an internal search engine?  
Is the site user-friendly?  
Do visual effects enhance the resource?

*Janet Schnall: "Navigating the Web: using search engines & evaluating resources"*

► **Sites To Visit**

**MedlinePlus**      <http://medlineplus.gov>

**Martindale's Health Science Guide**

<http://www.martindalecenter.com/HSGuide.html>

**Journal Tables of Contents Service**

<http://www.tictocs.ac.uk>





▶ **In Early 1990s  
Start of  
Evidence-Based Medicine  
Revolution...**

► **As a Result to Information Explosion**

**17 articles/day vs. ~45 min/week**

Physicians get ~60 clinical questions/week, answer only 30% of them...

# ▶ **Traditional Approach to Clinical Practice**

## ► **Clinical Practice Situation...**

Archie Cochrane 1972:

*“healthcare not always based on evidence”*

**IOM study 2003:** average period between discovery of better treatments and their implementation into patient-care is 17 yrs.

•75% of practitioners were unaware of 2 high-profile NIH funded studies on conditions relevant to their practice, [2009].

**Centre for EBM in Oxford...**

## ► Deterioration in Performance

1. The level of diastolic blood pressure
2. The patient's age
3. ???
4. The amount of target-organ damage

## ► Definition of EBM

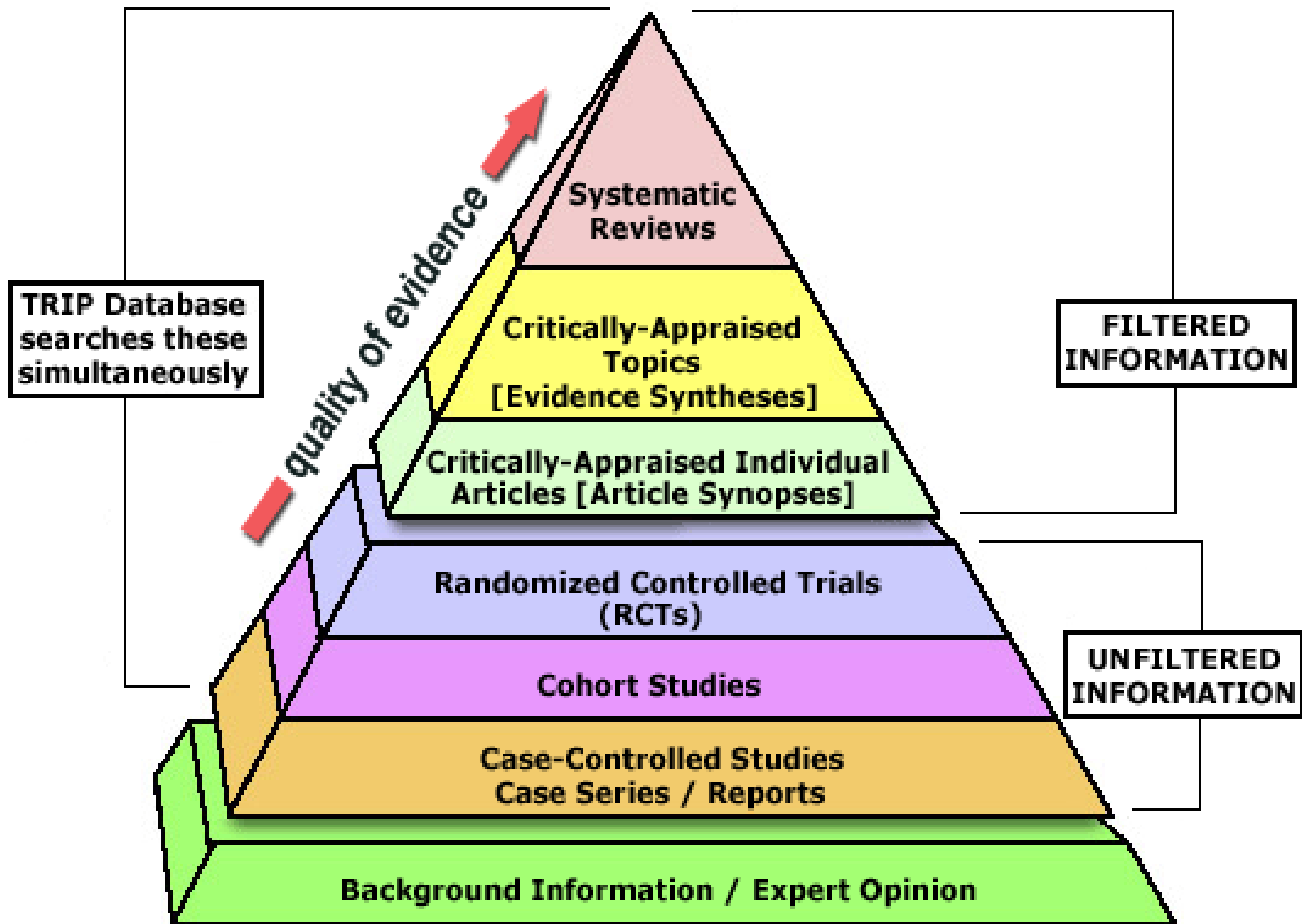
Evidence-Based Medicine (EBM) is “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient”  
David Sackett

**“The integration of best research evidence with clinical expertise and patient values.”**

*(Sackett et al., 2000)*



▶ **Where to Look  
for *Evidence*?**





► **Final Words on EBM...**

“No matter how good the evidence is, evidence doesn’t make decisions. People do. But perhaps with the evidence in hand, some future decisions might be just a little more informed.”

*Ray Moynihan. Evaluating Health Services: A Reporter Covers the Science of Research Synthesis, 2004.*

## ► **Searching is not always error free!**

The success depends on:

- expertise of the searcher;
- searcher's ability to define topic precisely;
- how specific & accurate is the indexing.

*There is no single correct way to do every search, and every time you do the search differently you get different results!*

**“Searching the Internet is both an art and a science”**



*“A speech should be like a woman's skirt: long enough to cover the topic yet short enough to keep the interest”*

*Winston Churchill*

**Thank you**  
**Any Questions?**

That's all for today's ppt lesson.