



# Evidence based medicine (EBM): a basic review for beginners

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# Learning objectives

- Define EBM ,Understand its goals and benefits.
- Understand the steps of practicing EBM.
- Formulate a clinical question using PICO.

# Introduction

*My students are dismayed when I say to them  
“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, dean of Harvard medical school)*

# What is EBM

- Evidence-based medicine (EBM) is the integration of best research evidence with clinical expertise and patient values.



- It aims to apply the best available evidence gained from the scientific method to medical decision making.



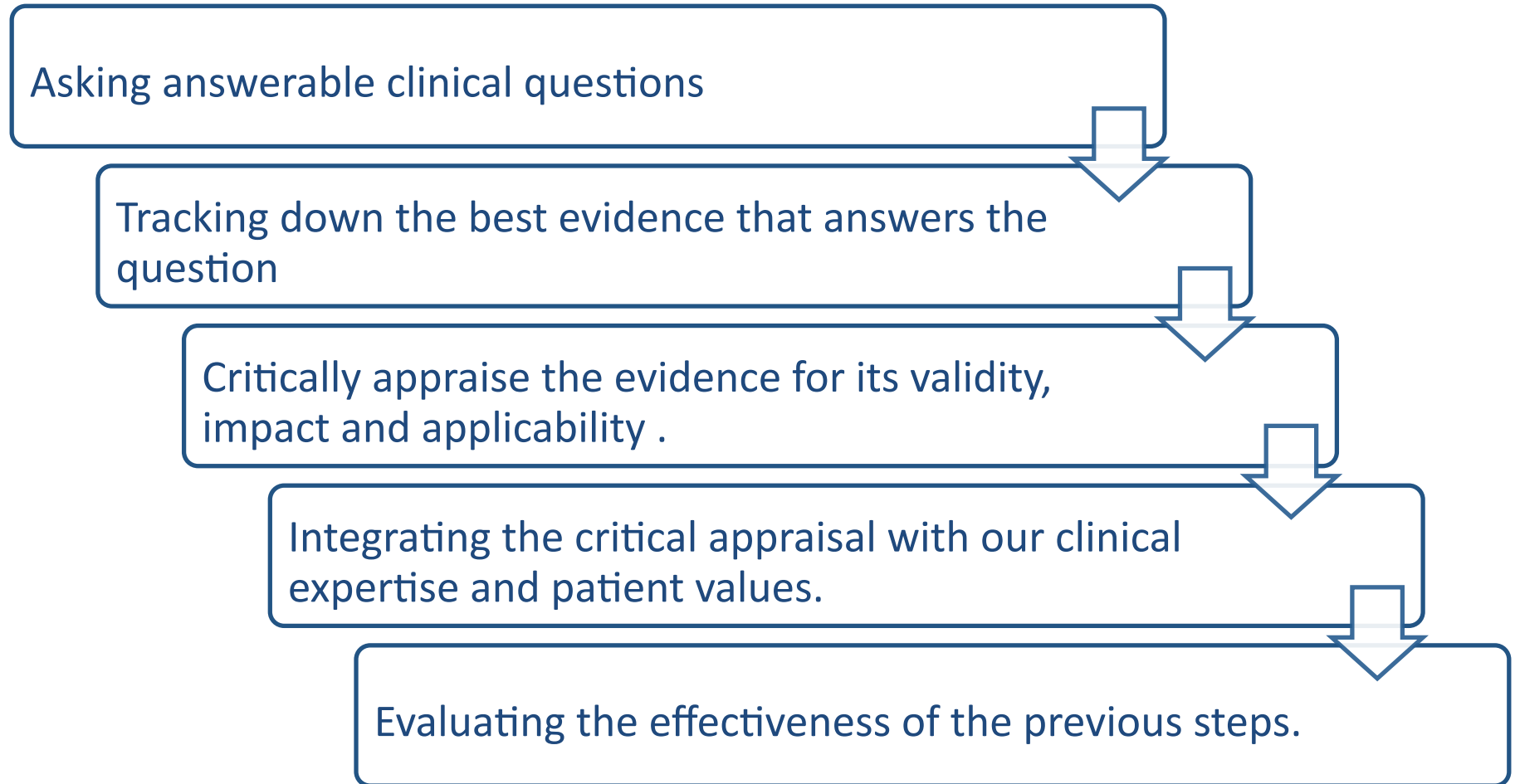
# Goals of EBM

- to improve the **quality of patient care** through:
  1. the identification and promotion of clinical practices that work.
  2. elimination of ineffective or harmful ones.
- This requires clinicians to be open-minded and to try new methods that are scientifically proven to be effective, and to discard old methods that are not.

# Benefits of EBM

1. to help clinicians deal with 'information overload'.
2. to reduce inequalities in the delivery of healthcare (and distribute healthcare resources more equitably).
3. to help reduce healthcare costs.
4. to justify treatment choices to the public.

# How do we actually practice EBM?

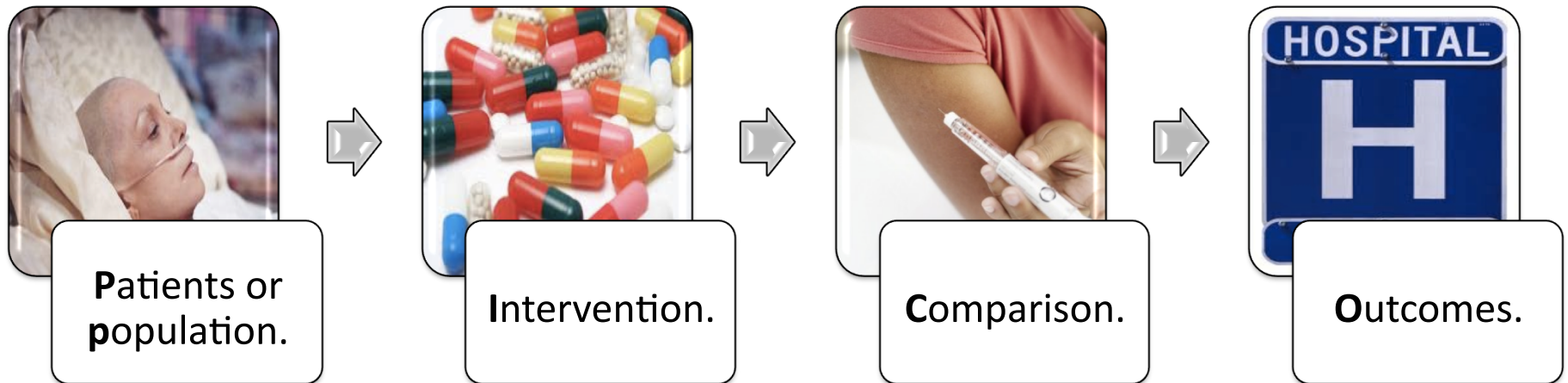


# Asking answerable clinical questions

- The practice of EBM should begin with a well formulated clinical question .
- Therefore, we need skills to convert the clinical problem or scenario into an answerable question.
- Good clinical question should be clear, directly focused on the problem and answerable by searching the medical literature.

# Asking answerable clinical questions

- A good clinical question should have four essential component, structured as **PICO** format.



# Asking answerable clinical questions

|                            |  |
|----------------------------|--|
| Patient population/disease | The patient population or disease of interest <ul style="list-style-type: none"><li>- age</li><li>- gender</li><li>- ethnicity</li><li>- with certain disorder (e.g., hepatitis)</li></ul>   |
| Intervention               | The intervention or range of interventions of interest <ul style="list-style-type: none"><li>- Exposure to disease</li><li>- Prognostic factor A</li><li>- Risk behavior (e.g., smoking)</li></ul>   |
| Comparison                 | What you want to compare the intervention against <ul style="list-style-type: none"><li>- No disease</li><li>- Placebo or no intervention/therapy</li><li>- Prognostic factor B</li><li>- Absence of risk factor (e.g., non-smoking)</li></ul> |
| Outcome                    | Outcome of interest <ul style="list-style-type: none"><li>- Risk of disease</li><li>- Accuracy of diagnosis</li><li>- Rate of occurrence of adverse outcome (e.g., death)</li></ul>  |

# Asking answerable clinical questions

## **Illustrating the concept of PICO**

A 70 years old female with osteopenia visited the clinic for routine check-up. the physician asked you whether to start Alendronate or keep her on calcium and vitamin D supplement to prevent future hip fractures.

**Formulate the clinical question using PICO.**

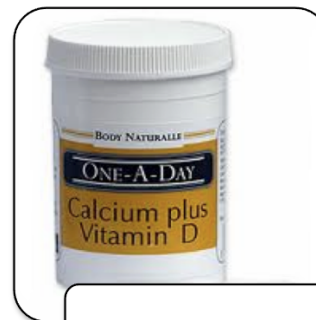
# Illustrating the concept of PICO



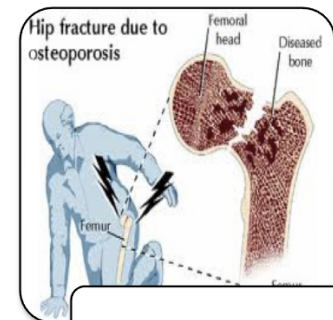
P=postmenopausal women with osteopenia.



I=Alendronate.



C=Calcium and Vitamin D.



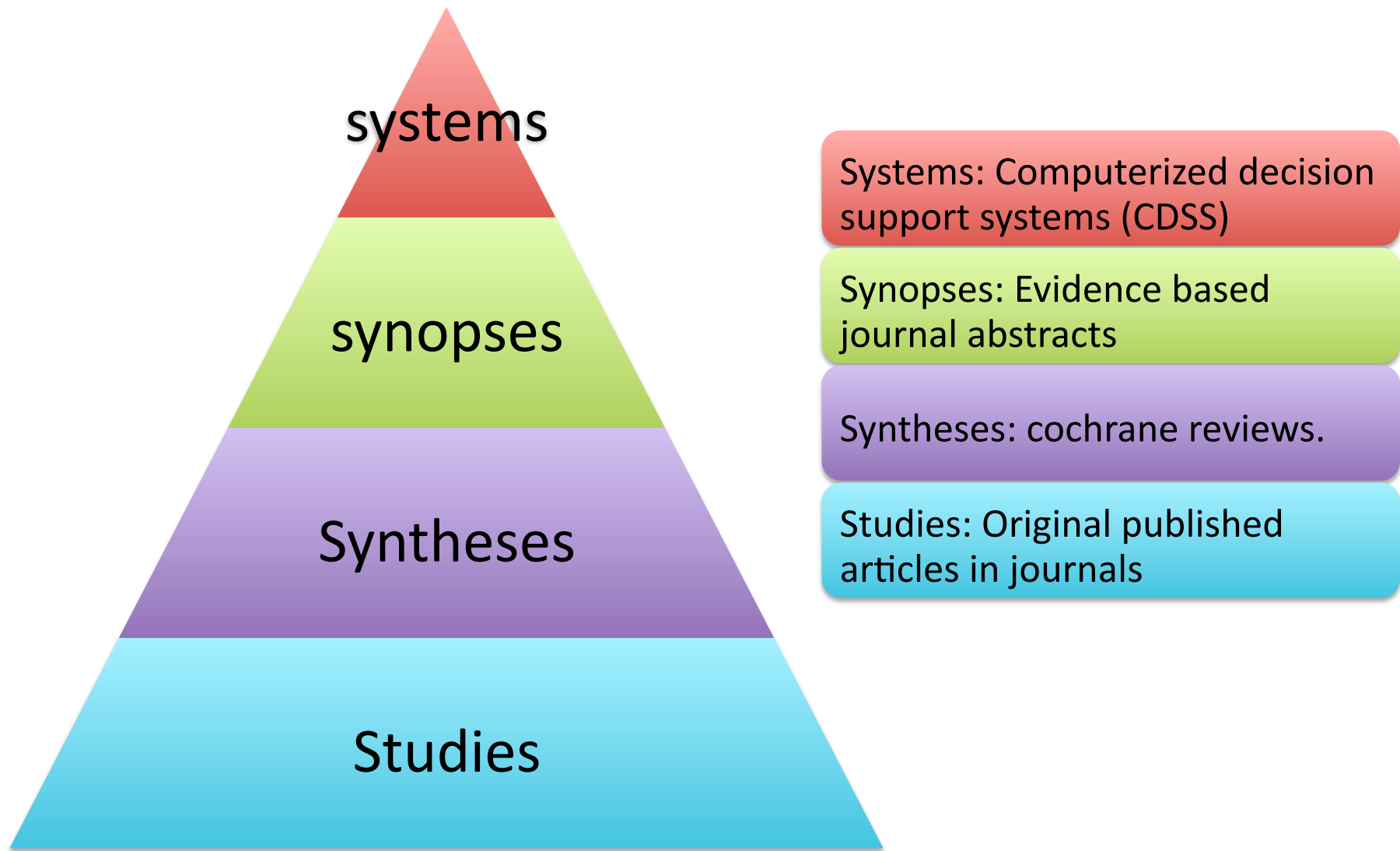
O=hip fracture prevention.



# Tracking down the best evidence

- Take a “4S” approach to evidence based information access.

# Tracking down the best evidence



The 4S organization of evidence to research

# Tracking down the best evidence

- **Systems**
- a **perfect** evidence based clinical information system would:
  1. Integrate and summarize all relevant research evidence about clinical problem .
  2. And automatically link ,through an electronic medical record ,a specific patient circumstances to the relevant information.

# Tracking down the best evidence

- Systems

## Format of alerts

Patient Name: X. X. (Hospital File Number: 99999999)

Time: 12/22/2008 11:42:08

---

Your patient has a critically low serum potassium concentration  
POTASSIUM - (Value: '3.0' ) at (12/22/2008 11:38:00 PM)

---

Recommend (click link below):

[http://www.healthchecklist.ca/ds/ds\\_lowpot.htm](http://www.healthchecklist.ca/ds/ds_lowpot.htm)


AlertID: 9999

---

# Tracking down the best evidence Systems

Progress Notes

Shelly Smith, 30 Y, F | [Set](#) | [Info](#) | [Hub](#)

 112 Turnpike rd  
Westborough, MA  
H:276-387-2439  
DOB:01/01/1978

**Allergies**  
Billing Alert

Wt: 180 lbs.  
Appt(L): 04/03/08  
PCP: Willis, Sam  
Language:


























Ins: Medicare  
Acc Bal: \$0.00  
Guar: John Smith  
Gr Bal: \$0.00


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**CDSS Alerts**

CDSS - Clinical Decision Support System

Show All Alerts

| Measure Name              | Fq   | Status                      | Orders  |
|---------------------------|------|-----------------------------|---|
| Smoking status updated    | 12 M | NON-COMPLIANT               |   Tobacco Control   Other Actions     |
| HIV screening             | 6 M  | NON-COMPLIANT               |   HIV   Other Actions                 |
| LDL testing (high risk)   | 12 M | NON-COMPLIANT               |   LIPID PROFILE   Other Actions       |
| A1C testing               | 6 M  | SNOOZED                     |   GLYCO HGB A1-C   Ordered            |
| BP control in DM (130/80) | 12 M | COMPLIANT                   |   DM - BP Control     |
| Body Mass Index updated   | 24 M | COMPLIANT                   |   BMI   Other Actions         |
| Cervical cancer screening | 6 M  | SUPPRESSED (MEDICAL REASON) |   CA screen - PAP      |

 Shelly Smith  
DOB: 01/01/1978, Age: 30 Y, Sex: female  
112 Turnpike rd, Westborough, MA 01581

**Plan:**  
**Treatm**  
Upper  
Increase in fluid intake and rest  
DM 2 [Diabetes mellitus type 2]  
Lab:GLYCO HGB A1-C  
Hypertension

Print Fax Record Lock Details Scan Templates Claim Letters Ink

# Tracking down the best evidence

- **Synopses**
- **Synopses:** are Concise short statements that summarize the evidence for a particular clinical question.
- When no evidence based information systems exists, then synopses of individual studies and reviews are the next best source.
- A **perfect** synopsis of review or original study would provide only, and exactly, enough information to support a clinical action.

## **Clopidogrel plus aspirin or aspirin alone in unstable angina**

### **Clinical Scenario**

A 55 year old man, known to have angina, presents to the Emergency Department with new-onset typical ischaemic rest pain that is not relieved by his nitrate spray at home. His ECG shows ST depression in V3-V6. He is haemodynamically stable. You treat him with oxygen, aspirin, nitrates, beta-blockers and heparin, after which he becomes pain free. You also give him clopidogrel 300 mg because you have heard that patients with unstable angina and non ST-elevation MI have a better cardiovascular outcome when treated with a combination of clopidogrel and aspirin versus aspirin alone. You wonder whether there is any evidence to support this.

### **Three Part Question**

In [patients suspected to have unstable angina] is [the use of clopidogrel plus aspirin better than aspirin alone] at [improving cardiovascular outcome]

---

## **Clopidogrel plus aspirin or aspirin alone in unstable angina**

### **Clinical Bottom Line**

Clopidogrel should be given to patients with non-ST elevation acute coronary syndromes in the Emergency Department.

### **Level of Evidence**

Level 2 - Studies considered were neither 1 or 3.



# Tracking down the best evidence

- **Syntheses**
- if more details are needed or no synopses are at hand, then databases of **systematic reviews** (syntheses) are available.
- Best sources for systematic reviews are:
  1. Cochrane database of systematic reviews (CDSR)
  2. Database of Abstracts of Reviews of Effects (DARE)
  3. All the above and other databases are combined in Ovid's EBMR.

# Cochrane database of systematic reviews (CDSR)





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Title, Abstract or Keywords ▾

diabetes

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There are **206** results out of **7092** records for: "diabetes in Title, Abstract or Keywords in Cochrane Database of Systematic Reviews"

View: [1-25](#) | [26-50](#) | [51-75](#) | [76-100](#) | [101-125](#) | [Next >](#)

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- ☐ [Oral anti-diabetic agents for women with pre-existing diabetes mellitus/impaired glucose tolerance or previous gestational diabetes mellitus](#)  
Joanna Tieu, Suzette Coat, William Hague, Philippa Middleton  
February 2011  
[Review](#)
- ☐ [Exercise or exercise and diet for preventing type 2 diabetes mellitus](#)  
Leonardo J Orozco, Ana Maria Buchleitner, Gabriel Gimenez-Perez, Marta Roqué i Figuls, Bernd Richter  
July 2008  
[Review](#)
- ☐ [Pioglitazone for type 2 diabetes mellitus](#)  
Bernd Richter, Elizabeth Bandeira-Echtler, Karla Bergerhoff, Christine Clar, Susanne H Ebrahim  
January 2009  
[Review](#)
- ☐ [Rosiglitazone for type 2 diabetes mellitus](#)  
Bernd Richter, Elizabeth Bandeira-Echtler, Karla Bergerhoff, Christine Clar, Susanne H Ebrahim  
January 2009  
[Review](#)
- ☐ [Group based training for self-management strategies in people with type 2 diabetes](#)  
Trudi A Deakin, Catherine McShane, Janet E Cade, Rhys Williams

### Intervention Review

**Oral anti-diabetic agents for women with pre-existing diabetes mellitus/impaired glucose tolerance or previous gestational diabetes mellitus**

Joanna Tieu<sup>1,\*</sup>, Suzette Coat<sup>2</sup>, William Hague<sup>2</sup>, Philippa Middleton<sup>1</sup>

Database Title

The Cochrane Library

Editorial Group: [Cochrane Pregnancy and Childbirth Group](#)

Published Online: 6 OCT 2010

Assessed as up-to-date: 30 AUG 2010

DOI: 10.1002/14651858.CD007724.pub2

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### Additional Information (Show All)

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# Database of Abstracts of Reviews of Effects (DARE)




Centre for Reviews and Dissemination

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Welcome to the new interface for the CRD databases.  
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You searched for **asthma**

Refine your search or start a new search

First **1** 2 3 4 5 6 7 8 9 10 > Last [Show all previews](#) [Select all](#) [Clear selections](#) [Export](#)

|                          | Year | Database | Record type                  | Title  |
|--------------------------|------|----------|------------------------------|--|
| <input type="checkbox"/> | 2011 | DARE     | Systematic review            | Accuracy of eucapnic hyperpnea or mannitol to diagnose exercise-induced bronchoconstriction: a systematic review <a href="#">[Preview]</a>   |
| <input type="checkbox"/> | 2011 | NHS EED  | Economic evaluation          | A comparison of budesonide/formoterol maintenance and reliever therapy versus conventional best practice in asthma management in Spain <a href="#">[Preview]</a>   |
| <input type="checkbox"/> | 2011 | DARE     | Systematic review            | Addition of theophylline or increasing the dose of inhaled corticosteroid in symptomatic asthma: a meta-analysis of randomized controlled trials <a href="#">[Preview]</a>   |
| <input type="checkbox"/> | 2011 | HTA      | Health technology assessment | A pragmatic single-blind randomised controlled trial and economic evaluation of the use of leukotriene receptor antagonists in primary care at steps 2 and 3 of the national asthma guidelines (ELEVATE study) <a href="#">[Preview]</a> |
| <input type="checkbox"/> | 2011 | DARE     | Systematic review            | BCG vaccination and allergy: a systematic review and meta-analysis <a href="#">[Preview]</a>   |
| <input type="checkbox"/> | 2011 | HTA      | Health technology assessment | Buteyko breathing technique for treatment of asthma <a href="#">[Preview]</a>  |
| <input type="checkbox"/> | 2011 | DARE     | Systematic review            | Comparison of leukotriene receptor antagonist and theophylline in addition to inhaled corticosteroid in adult asthma: a meta-analysis <a href="#">[Preview]</a>  |

|                          |      |         |                     |   |
|--------------------------|------|---------|---------------------|---|
| <input type="checkbox"/> | 2011 | DARE    | Systematic review   | Comparison of leukotriene receptor antagonist and theophylline in addition to inhaled corticosteroid in adult asthma: a meta-analysis <a href="#">[Preview]</a> |
| <input type="checkbox"/> | 2011 | NHS EED | Economic evaluation | Cost-benefit analysis of childhood asthma management through school-based clinic programs <a href="#">[Preview]</a>   |

# Database of Abstracts of Reviews of Effects (DARE)



## Comparison of leukotriene receptor antagonist and theophylline in addition to inhaled corticosteroid in adult asthma: a meta-analysis

Fang H, Wang J, Jin D, Cao Y, Xu Y, Xiong W

### Record Status

This is a systematic review that meets the criteria for inclusion on DARE. If you would like us to consider prioritising the writing of a critical abstract for this review please e-mail: CRD-DARE@york.ac.uk quoting the Accession Number of this record. Please note that priority is given to fast track requests from the UK National Health Service.

### Bibliographic details

Fang H, Wang J, Jin D, Cao Y, Xu Y, Xiong W. Comparison of leukotriene receptor antagonist and theophylline in addition to inhaled corticosteroid in adult asthma: a meta-analysis. *Biomolecules and Therapeutics* 2011; 19(3): 296-301

### Indexing Status

Subject indexing assigned by CRD

### MeSH

Administration, Inhalation; Adrenal Cortex Hormones; Adult; Asthma; Humans; Leukotriene Antagonists; Theophylline

### AccessionNumber

12011005366

### Database entry date

30/11/2011

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- ☐ [EBM Reviews - Database of Abstracts of Reviews of Effects](#) 1st Quarter 2012
- ☐ [EBM Reviews - Health Technology Assessment](#) 1st Quarter 2012
- ☐ [EBM Reviews - NHS Economic Evaluation Database](#) 1st Quarter 2012
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- ☐ [Ovid MEDLINE\(R\)](#) 1946 to February Week 5 2012
- ☐ [Ovid MEDLINE\(R\) without Revisions](#) 1996 to February Week 5 2012
- ☐ [Ovid MEDLINE\(R\) In-Process & Other Non-Indexed Citations](#) March 08, 2012
- ☐ [Ovid MEDLINE\(R\) Daily Update](#) March 08, 2012
- ☐ [Ovid OLDMEDLINE\(R\)](#) 1946 to 1965

# Tracking down the best evidence

- **Studies**

- It takes time to summarize new evidence, and systems, synopses and syntheses necessarily follow the publication of original *studies*, usually by at least 6-12 months.
- If every other “S” fails to find a clear answer to your question, then it's time to look for original studies.

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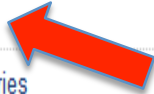
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### Clinical Study Categories

Category:

Scope: 

Etiology

Diagnosis

Therapy

Prognosis

Clinical prediction guides

**Results: 5**

Medication Adherence in Type 2 Diabetes: The ENTRED Study 2007, a French Population-Based Study. [\[PLoS One. 2012\]](#)

Trans fat consumption and aggression. [\[PLoS One. 2012\]](#)

Physical exercise in southern Germany: a cross-sectional study of an urban population. [\[BMJ Open. 2012\]](#)

Deep Resequencing Unveils Genetic Architecture of ADIPOQ and Identifies a Novel Low-Frequency Variant Strongly Associated With Adiponectin Variation. [\[Diabetes. 2012\]](#)

Effects of Icariside II on improving erectile function in Rats with Streptozotocin-Induced Diabetes. [\[J Androl. 2012\]](#)

[See all \(124772\)](#)

Display citations filtered to a specific clinical study category and scope. These search filters were developed by [Haynes RB et al.](#) See more [filter information](#).

### Systematic Reviews

**Results: 5 of 6797**

Cushing syndrome: maybe not so uncommon of an endocrine disease. [\[J Am Board Fam Med. 2012\]](#)

Gender and survival in patients with heart failure: interactions with diabetes and aetiology. Results from the MAGGIC individual patient meta-analysis. [\[Eur J Heart Fail. 2012\]](#)

A meta-analysis of receptor for advanced glycation end products gene: Four well-evaluated polymorphisms with diabetes mellitus. [\[Mol Cell Endocrinol. 2012\]](#)

Prevalence and risk factors associated with nutrition-related noncommunicable diseases in the Eastern Mediterranean region. [\[Int J Gen Med. 2012\]](#)

Incidence of re-amputation following partial first ray amputation associated with diabetes mellitus and peripheral sensory neuropathy: a systematic review. [\[Diabet Foot Ankle. 2012\]](#)

[See all \(6797\)](#)

Display citations for systematic reviews, meta-analyses, reviews of clinical trials, evidence-based medicine, consensus development conferences, and guidelines. See [filter information](#) or additional [related queries](#).

### Medical Genetics

Topic:

**Results: 5 of 48626**

Common Variants in the Type 2 Diabetes KCNQ1 Gene Are Associated with Impairments in Insulin Secretion During Hyperglycaemic Glucose Clamp. [\[PLoS One. 2012\]](#)

Statistical colocalisation of monocyte gene expression and genetic risk variants for type 1 diabetes. [\[Hum Mol Genet. 2012\]](#)

Functional analysis of TCF7L2 genetic variants associated with type 2 diabetes. [\[Nutr Metab Cardiovasc Dis. 2012\]](#)

221 generation of germ-line competent embryonic stem cells from non-obese diabetic (nod) mice using a single inhibitor. [\[Reprod Fertil Dev. 2011\]](#)

Friedreich's Ataxia reveals a mechanism for coordinate regulation of oxidative metabolism via feedback inhibition of the SIRT3 deacetylase. [\[Hum Mol Genet. 2012\]](#)

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Display citations pertaining to topics in medical genetics. See more [filter information](#).





- If you still have no luck and the topic is, say, a new treatment (that one of your patients has asked about but you don't yet know about ...), then you can try Google.

<http://www.google.com>


# Useful evidence based resources

- [www.clinicalevidence.com](http://www.clinicalevidence.com)

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Discover more about EBM   

[COPD](#) [Interventions](#)


### COPD

Web publication date: 06 June 2011 (based on April 2010 search)  
Robert Andrew McIvor, Marcel Tunks and David Charles Todd

[Interventions \(20\)](#)  
[Citations \(47\)](#)  
[Guidelines \(17\)](#)  
[Key points](#)  
[Background](#)  
[References](#)  
[Patient information \(1\)](#)  
[Credits](#)

#### Interventions

**What are the effects of maintenance drug treatment in stable COPD?**

|                                      |   |  |
|--------------------------------------|---|--|
| Beneficial                           |  | <ul style="list-style-type: none"><li>Anticholinergics (inhaled)</li><li>Anticholinergics plus beta2 agonists (inhaled)</li><li>Beta2 agonists (inhaled)</li><li>Corticosteroids (inhaled)</li><li>Corticosteroids plus long-acting beta2 agonists (inhaled)</li></ul> |
| Likely to be beneficial              |  | <ul style="list-style-type: none"><li>Oxygen treatment (long-term domiciliary treatment)</li></ul>   |
| Trade off between benefits and harms |  | <ul style="list-style-type: none"><li>Theophylline</li></ul>   |
| Unknown effectiveness                |  | <ul style="list-style-type: none"><li>Alpha1 antitrypsin</li></ul>   |

# Useful evidence based resources

- [www.dynamed.ebscohost.com](http://www.dynamed.ebscohost.com)

The screenshot displays the DynaMed website interface. At the top, a navigation bar includes links for Home, Recent Updates, E-Newsletter, Mobile, and Calculators. A search bar with a 'Search' button and a help icon is present. The DynaMed logo, 'Powered by EBSCOhost', is on the left. The main content area shows search results for 'Obesity in children and adolescents'. A left sidebar contains a 'Top' section with a 'Related Summaries' list of topics like 'Obesity (list of topics)', 'Obesity in adults', 'Morbidity obesity', 'Diets for weight loss', 'Physical activity for weight loss', 'Weight loss medications for obesity in children and adolescents', 'Weight loss non-prescription medications and supplements', 'Weight loss medications withdrawn from market', and 'NHLBI integrated guidelines for pediatric cardiovascular risk reduction'. The main content area has a 'Back' button, '1 of 1' indicator, and 'Expand All'/'Collapse All' links. The title 'Obesity in children and adolescents' is followed by 'Also called:' (childhood obesity) and 'Definitions:' (listing various criteria and references). The 'Incidence/Prevalence:' section mentions the prevalence of overweight and obesity in children increasing in the United States.

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CONSUMER WEBS

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### Obesity in children and adolescents

**Also called:**

- childhood obesity

**Definitions:**

- no international consensus on clinically meaningful cut-offs for classification of overweight and obese children, commonly used criteria include
  - 110% and 120% of ideal weight for height
  - weight-for-height Z-scores of > 1 and > 2
  - 85th, 90th, 95th, and 97th percentiles for body mass index (BMI)
  - Reference - [Lancet 2010 May 15;375\(9727\):1737 full-text](#)
- American Medical Association (AMA) Expert Committee recommendations suggest
  - BMI ≥ 85th percentile but < 95th percentile for sex and age considered "overweight"
  - BMI ≥ 95th percentile for sex and age considered "obese"
  - BMI ≥ 99th percentile for sex and age considered "severely obese"
  - Reference - [Am Fam Physician 2008 Jul 1;78\(1\):56 full-text](#), editorial can be found in [Am Fam Physician 2008 Jul 1;78\(1\):34, 37](#)
- Centers for Disease Control and Prevention (CDC) recommended growth charts with percentile curves include
  - for children aged 0-24 months use [WHO growth charts](#) (97.7th percentile is upper limit of normal weight)
  - for children aged ≥ 2 years use [CDC growth charts](#) (95th percentile is upper limit of normal weight)
  - Reference - [MMWR Recomm Rep 2010 Sep 10;59\(RR-9\):1 full-text](#) or at [National Guideline Clearinghouse 2011 Jun 20:25642](#)
- BMI cut-offs in adults
  - obesity = BMI 30 kg/m<sup>2</sup> or higher
  - morbid obesity = extreme obesity = BMI 40 kg/m<sup>2</sup> or higher
  - overweight = BMI 25-29.9 kg/m<sup>2</sup>
  - underweight = BMI < 18.5 kg/m<sup>2</sup>

**Incidence/Prevalence:**

- prevalence of overweight and obesity in children increasing in United States
  - 20-30% prevalence of obesity in children in kindergarten to grade 8 in New York City in 2010-2011 ([MMWR Morb Mortal Wkly Rep 2011 Dec 16;60:1673 full-text](#))

Send Comment to Editor

# Useful evidence based resources

- [www.uptodate.com](http://www.uptodate.com)

The screenshot displays the UpToDate website interface. At the top, a search bar contains the word "diabetes". Below the search bar, a navigation menu includes "New Search", "Patient Info", "What's New", and "Calculators". The search results for "diabetes" are shown, indicating that "diabetes" means "diabetes mellitus" and suggesting an alternative term: "diabetes insipidus". A list of topics is provided, with "Overview of medical care in adults with diabetes mellitus" selected. The article page for this topic is displayed, featuring a "TOPIC OUTLINE" on the left and the main text on the right. The article includes sections for "INTRODUCTION", "EVALUATION FOR DIABETIC COMPLICATIONS", and "REDUCING THE RISK OF MACROVASCULAR DISEASE". The "Disclosures" section states that all topics are updated as new evidence becomes available and that the literature review is current through January 2012. The article was last updated on January 30, 2012. The "INTRODUCTION" section discusses the estimated prevalence of diabetes among adults in the United States, ranging from 4.4 to 17.9 percent (median 8.2 percent). The article also mentions that diabetes accounts for almost 14 percent of US health care expenditures, at least one-half of which are related to complications such as myocardial infarction, stroke, end-stage renal disease, retinopathy, and foot ulcers. The "REDUCING THE RISK OF MACROVASCULAR DISEASE" section lists several factors, including smoking cessation, aspirin, blood pressure control, and dyslipidemia. The article is authored by David K McCulloch, MD, and is edited by David M Nathan, MD. The deputy editor is Jean E Mulder, MD. The article is part of a series of reviews for patients with diabetes, and the user is prompted to provide feedback on the article's usefulness.

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Search Results for "diabetes"

diabetes means **diabetes mellitus**. Click alternative term: [diabetes insipidus](#)

All Topics

- Adult
- Pediatric
- Patient
- Graphics

- Overview of medical care in adults with diabetes mellitus
- Epidemiology, prevalence, and risk factors in children and adolescents
- Screening for diabetes in children and adolescents
- Treatment of type 1 diabetes in children and adolescents
- Epidemiology, prevalence, and risk factors in adults
- Classification of diabetes
- Complications and comorbidities of diabetes mellitus
- Overview of diabetes management
- Treatment of diabetes in adults
- Overview of diabetes management in children and adolescents
- Epidemiology and risk factors in children and adolescents

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Back to Search Results for "diabetes"

Find Patient Print Email

Overview of medical care in adults with diabetes mellitus

Author: David K McCulloch, MD  
Section Editor: David M Nathan, MD  
Deputy Editor: Jean E Mulder, MD

Disclosures

All topics are updated as new evidence becomes available and our [peer review process](#) is complete.  
Literature review current through: Jan 2012. | This topic last updated: Jan 30, 2012.

**INTRODUCTION** — The estimated prevalence of diabetes among adults in the United States ranges from 4.4 to 17.9 percent (median 8.2 percent) [1]. However, because of the associated microvascular and macrovascular disease, diabetes accounts for almost 14 percent of US health care expenditures, at least one-half of which are related to complications such as myocardial infarction, stroke, end-stage renal disease, retinopathy, and foot ulcers [2,3].

Numerous factors, in addition to directly related medical complications, contribute to the impact of diabetes on quality of life and economics. Diabetes is associated with a high prevalence of affective illness [4] and adversely impacts employment, absenteeism, and work productivity [5].

This review will provide an overview of the medical care for patients with diabetes (table 1).  
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# Useful evidence based resources

- [www.tripdatabase.com](http://www.tripdatabase.com)

The screenshot displays the Trip Database interface. At the top, there is a navigation bar with links: Home, About, Login, Register, Labs. The Trip Database logo is on the right. Below the navigation bar is a search bar containing the text 'angina [title]' and a yellow 'Search' button. To the right of the search bar are links for 'Advanced Search', 'History', and 'Search Tips'. A 'Translate' button with flags for various countries is also present.

The main content area is divided into three columns:

- FILTER SEARCH**: This column on the left allows users to filter results. It includes an 'Order By' dropdown set to 'Relevance' and a note '(Showing all results - Only show new)'. A table lists various evidence types with their counts:
 

| EVIDENCE                  | Count |
|---------------------------|-------|
| All Secondary Evidence    | 1,339 |
| Evidence Based Synopses   | 315   |
| Systematic Reviews        | 728   |
| Guidelines                |       |
| Aus. & NZ                 | 39    |
| Canada                    | 30    |
| UK                        | 104   |
| USA                       | 97    |
| Other                     | 26    |
| Clinical Q&A              | 123   |
| Core primary research     | 330   |
| Extended primary research | 3,125 |
| eTextbooks                | 1,021 |
| Patient Decision Aids     | 6     |
| Patient Information       | 281   |
| More                      | 225   |
| News                      | 191   |
- SEARCH RESULTS**: This central column displays a list of search results. It starts with a 'Select All' checkbox and a 'Choose Your Action' dropdown. The results are numbered 1 through 4:
  - The management of stable angina**: NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE - CLINICAL GUIDELINES 2011. Includes links for CPD/CME, Developing World?, Related, Conclusion, and Preview.
  - Unstable angina and NSTEMI: the early management of unstable angina and non-ST-segment-elevation myocardial infarction**: NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE - CLINICAL GUIDELINES 2010. Includes links for CPD/CME, Developing World?, Related, Conclusion, and Preview.
  - Drug-eluting stents versus bare metal stents for angina or acute coronary syndromes**: COCHRANE DATABASE OF SYSTEMATIC REVIEWS 2010. Includes links for CPD/CME, Developing World?, Related, Conclusion, Preview, and DOI.
  - Traditional Chinese herbal products for stable angina**: COCHRANE DATABASE OF SYSTEMATIC REVIEWS 2010. Includes links for CPD/CME, Developing World?, Related, Conclusion, Preview, and DOI.
- ASSOCIATED RESULTS**: This column on the right provides additional information. It includes 'MEDLINE ARTICLES' with a table:
 

| Category           | Count |
|--------------------|-------|
| Therapy            | 1,654 |
| Etiology           | 418   |
| Diagnosis          | 179   |
| Prognosis          | 1,071 |
| Systematic Reviews | 95    |

 Below this is 'CLINICAL TRIALS' with a link to ClinicalTrials.gov and a note '0 trials'. At the bottom is 'BNF RESULTS' with a list of topics: Cardiac emergencies, Coronary artery disease, 2.4 Beta-adrenoceptor blocking drugs, 2.6.1 Nitrates, and 2.6.2 Calcium-channel blockers. A link 'View full results on bnf.org...' is provided.

# Critically appraise the evidence

- Research evidence may be appraised with regard to three main areas:

## **1- Validity (closeness to the truth):**

“Can we trust this article?”

## **2- Importance or impact (size of the effect):**

“We trust the article, but is the conclusion drawn important?”

## **3- Applicability (usefulness in practice) :**

“can the conclusion drawn be applied to all of our patients?”

# Critically appraise the evidence

- Critical appraisal provides a structured but simple method for assessing research evidence.
- Several tools for appraising RCT ,SR, case control and cohort studies are available.
- Critical appraisal skills program (CASP) developed these tools which are simple, easy to use and freely available on the internet.

# Integrating the critical appraisal to practice

- The critically appraised evidence should “fit” our patient or population .
- **factors to be considered when integrating the evidence in practice:**
  1. Similarities and differences between our patient and those in the study.
  2. Cost.
  3. Availability.
  4. Patient preference and values.



# Evaluating the effectiveness

- As we incorporate EBM into routine clinical practice, we need to **evaluate our approach at frequent intervals** and to decide whether we need to improve on any of the four steps discussed above.
- Formal auditing of performance may be needed to show whether the EBM approach is improving patient care.