Evidence-Based Medicine

Speaker：Yu-Xuan Lin

What is
"Evidence-Based Medicine?"

你每天花多少時間處理臨床問題?

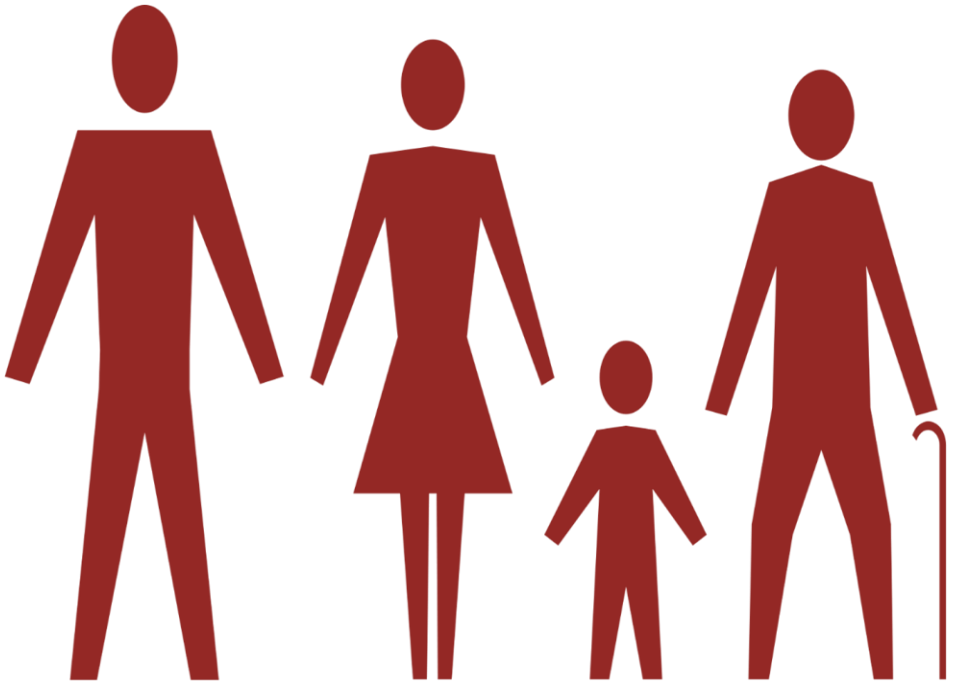
- 當你遇到一個臨床問題時，你有多少時間或願意花多少時間處理這些問題?

  10分鐘? 30分鐘? 1小時?

  別逗了，那是不可能的…

- ✓ Expectations of patient involvement in treatment decisions were high, particularly among younger people, with 74% indicating a desire to be actively involved.

European journal of public health 2005;15:355-60.



威而鋼助抗癌！加拿大最新研究：搭配流感疫苗「殺死90%癌細胞」

▶ 0:00 / 2:59

【徵文】一吐你的工作奇葩事，爽賺獎金5千

1.1 萬 讚

ETtoday新聞雲 已追蹤 383 萬 按讚次數

Myeloid derived suppressor cells—An overview of combat strategies to increase immunotherapy efficacy ›

Oana Draghiciu, Joyce Lubbers, Hans W Nijman & Toos Daemen

OncoImmunology, Volume 4, 2015 - Issue 1

Published Online: 31 Oct 2014

Review article

Immune modulation of the tumor microenvironment for enhancing cancer immunotherapy ›

Christel Devaud, Liza B John, Jennifer A Westwood, Phillip K Darcy & Michael H Kershaw

OncoImmunology, Volume 2, 2013 - Issue 8

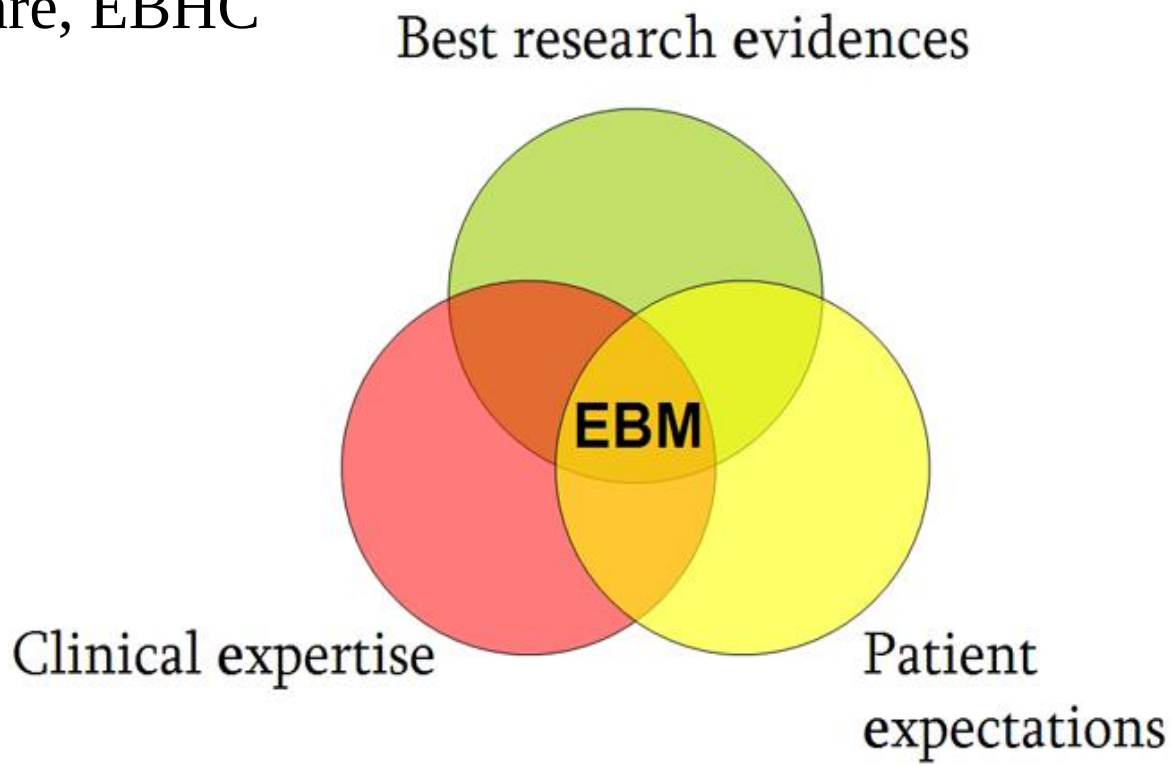
Published Online: 22 Aug 2013

Half of what we are going to teach you is wrong, and half of it is right. Our problem is that we don't know which half is which. Charles Sidney Burwell

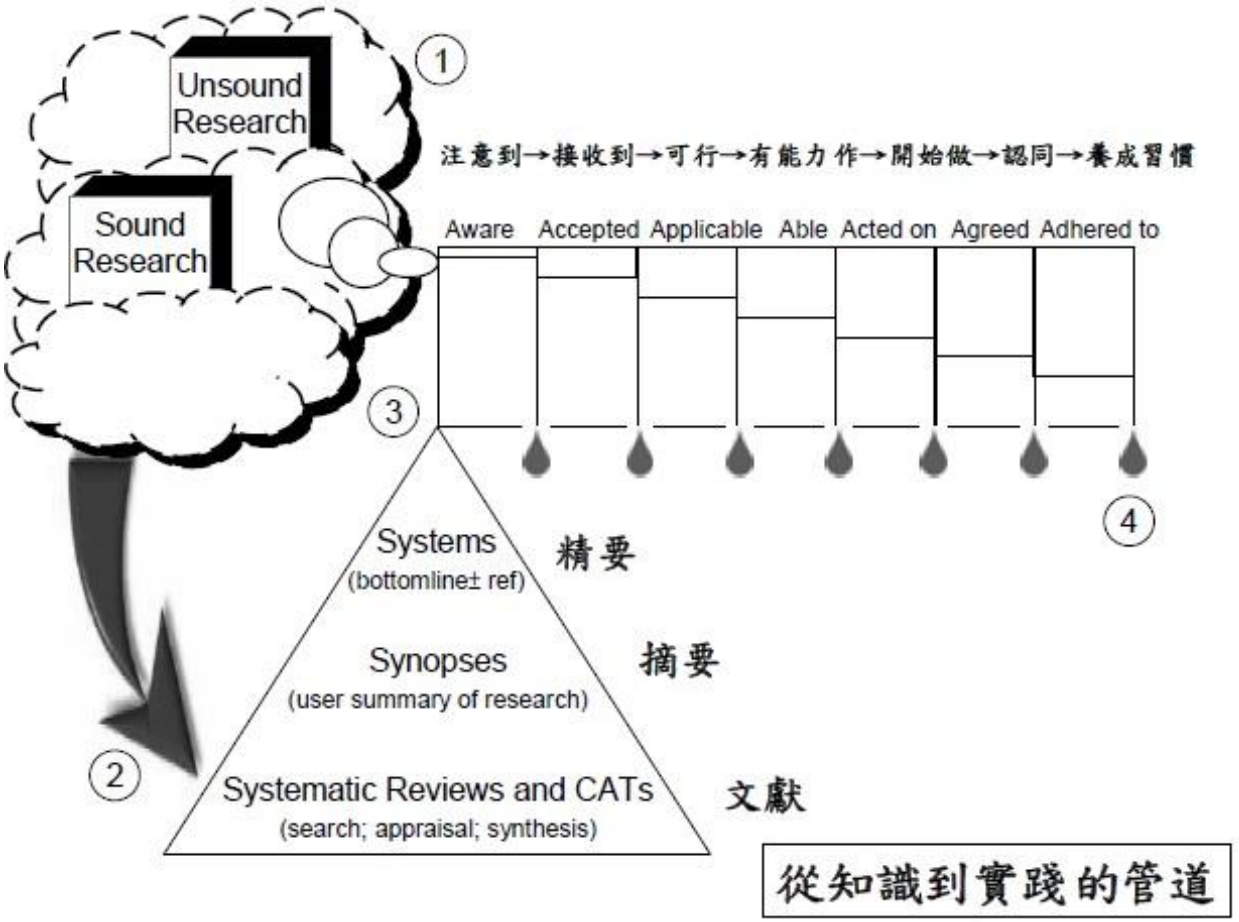
Introduction Evidence Based Medicine

- Evidence-based medicine is the integration of best research evidence with clinical expertise and patient values. (Sackett et al., 2000)

✓ Evidence-based medicine, EBM
✓ Evidence-based nursing, EBN
✓ Evidence-based Health Care, EBHC
✓ Evidence-based ? EB?



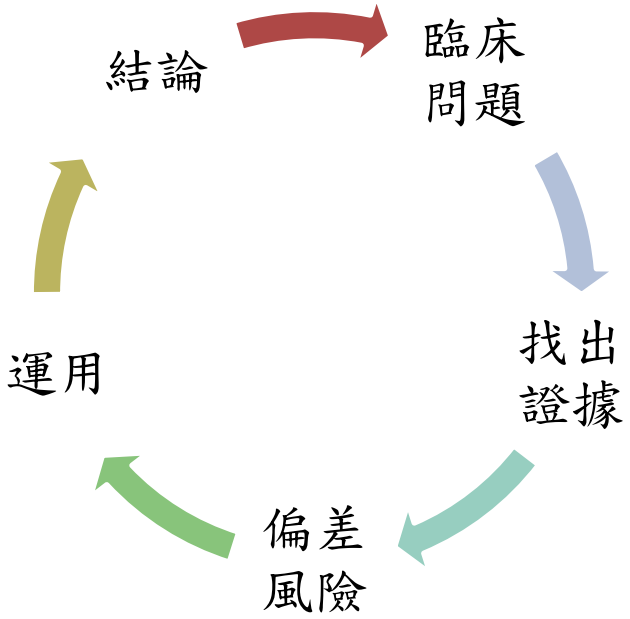
The core mechanisms in EBM include the following four steps



The core mechanisms in EBM include the following four steps

- **Formulate a clear clinical question from a patient's problem.**
- Search the literature for relevant clinical articles.
- Evaluate (critically appraise) the evidence for its validity and usefulness.
- Implement useful findings in clinical practice.

Clinics in Dermatology (2010) 28, 553–557

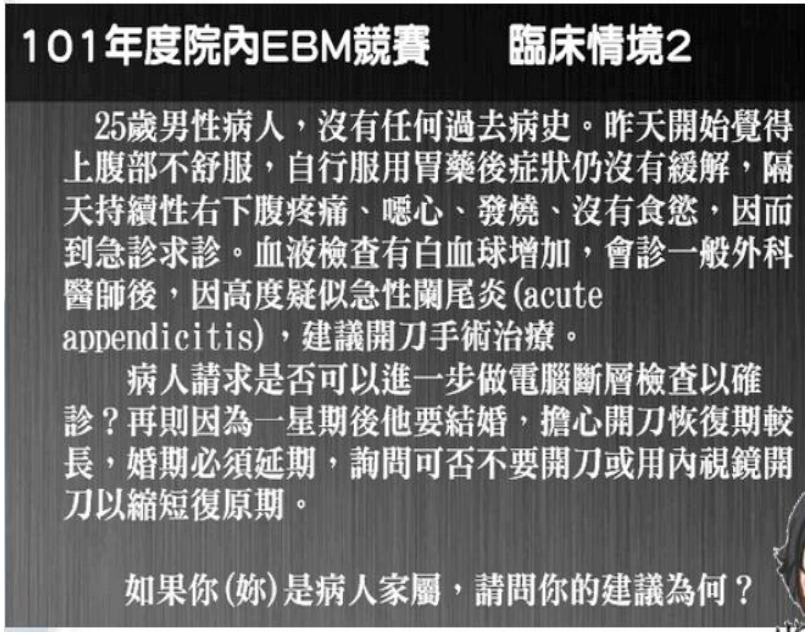


How to ask clinical question you can answer ?

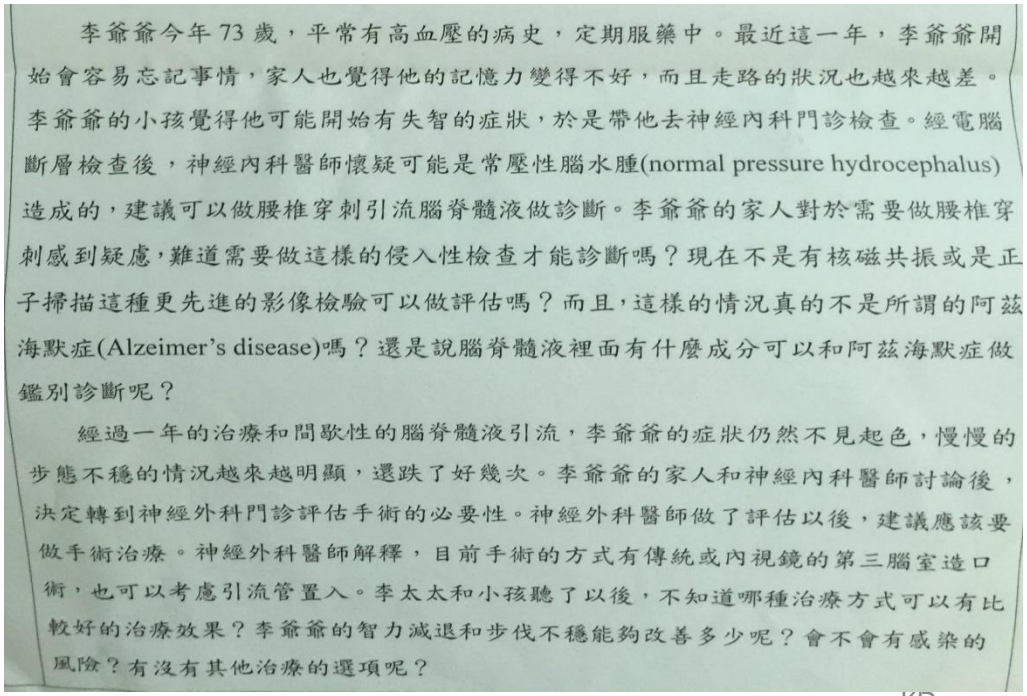
P.I.C.O. Model for Clinical Questions		
P	**P**atient, Population, or Problem	How would I describe a group of patien ts similar to mine?
I	**I**ntervention, Prognostic Factor, o r Exposure	Which main intervention, prognostic fact or, or exposure am I considering?
C	**C**omparison or Intervention (if a ppropriate)	What is the main alternative to compar e with the intervention?
O	**O**utcome you would like to meas ure or achieve	What can I hope to accomplish, measur e, improve, or affect?
	What type of question are you asking?	Diagnosis, Etiology/Harm, Therapy, Pro gnosis, Prevention
	Type of study you want to find	What would be the best study design /methodology?

100年

- 我有一位65歲阿姨最近要去美國看她剛出生沒多久的孫子，這是她第一次坐飛機長途飛行，因此她很緊張，到處詢問長途飛行的注意事項。她找到雜誌上一篇有關的報導，其中有提到穿彈性襪可以預防長途飛行產生腳部靜脈栓塞，因此她打電話問我她要不要買來穿？



現年44歲的劉小姐，從國中起，右側聽力逐漸變差，但無其他不適且左側聽力正常，因此一直不以為意，直到2013年右側耳朵幾乎聽不見，且有耳鳴情形，舌頭更出現如同被針扎的刺痛感，止痛藥無效，連吃東西、喝水通通不行，進一步檢查發現，原來是顱內有超過3公分大的聽神經瘤！而隨行家人與劉小姐利用手機與平板查詢之後，發現臨床鑑別診斷以電腦斷層與核磁共振為主，
在此想詢問各位專業醫療人員，到底電腦斷層與核磁共振二者之間哪一種檢查的鑑別診斷率最高?


李爺爺今年 73 歲，平常有高血壓的病史，定期服藥中。最近這一年，李爺爺開始會容易忘記事情，家人也覺得他的記憶力變得不好，而且走路的狀況也越來越差。李爺爺的小孩覺得他可能開始有失智的症狀，於是帶他去神經內科門診檢查。經電腦斷層檢查後，神經內科醫師懷疑可能是常壓性腦水腫(normal pressure hydrocephalus)造成的，建議可以做腰椎穿刺引流腦脊髓液做診斷。李爺爺的家人對於需要做腰椎穿刺感到疑慮，難道需要做這樣的侵入性檢查才能診斷嗎？現在不是有核磁共振或是正子掃描這種更先進的影像檢驗可以做評估嗎？而且，這樣的情況真的不是所謂的阿茲海默症(Alzeimer's disease)嗎？還是說腦脊髓液裡面有什麼成分可以和阿茲海默症做鑑別診斷呢？

經過一年的治療和間歇性的腦脊髓液引流，李爺爺的症狀仍然不見起色，慢慢的步態不穩的情況越來越明顯，還跌了好幾次。李爺爺的家人和神經內科醫師討論後，決定轉到神經外科門診評估手術的必要性。神經外科醫師做了評估以後，建議應該要做手術治療。神經外科醫師解釋，目前手術的方式有傳統或內視鏡的第三腦室造口術，也可以考慮引流管置入。李太太和小孩聽了以後，不知道哪種治療方式可以有比較好的治療效果？李爺爺的智力減退和步伐不穩能夠改善多少呢？會不會有感染的風險？有沒有其他治療的選項呢？

第十七屆醫療品質獎

實證醫學類**文獻查證組**評分項目

項目（權重）		給分				
PICO的質與量 10%	1.清楚描述病人(族群)及疾病	5	4	3	2	1
	2.清楚描述主要/其它的介入處置或暴露因素	5	4	3	2	1
	3.正確指出結果成效的測量指標	5	4	3	2	1
文獻搜尋的方法與分析 30%	1.關鍵字使用合適	5	4	3	2	1
	2.清楚的敘述檢索策略	5	4	3	2	1
	3.利用各種檢索功能提昇搜尋效率	5	4	3	2	1
	4.清楚地描述挑選文獻的理由	5	4	3	2	1
嚴格的文獻評讀 35%	1.正確使用文獻評讀指南工具	5	4	3	2	1
	2.正確且嚴謹的評讀「效度」(validity)	5	4	3	2	1
	3.正確且嚴謹的評讀「效益」(importance)	5	4	3	2	1
	4.正確的整合及評定證據等級	5	4	3	2	1
證據之臨床應用 20%	1.是否能應用在本案例及類似的病人上	5	4	3	2	1
	2.是否考慮到成本效益	5	4	3	2	1
	3.描述不同臨床決策對醫療品質的影響	5	4	3	2	1
	4.有考量病人觀點	5	4	3	2	1
現場表現 5%	1.報告內容系統分明、前後連貫	5	4	3	2	1
	2.圖表文字清晰簡明，易於瞭解	5	4	3	2	1
加分項目 2%	1.團隊的呈現手法創新	2		1		0

The core mechanisms in EBM include the following four steps

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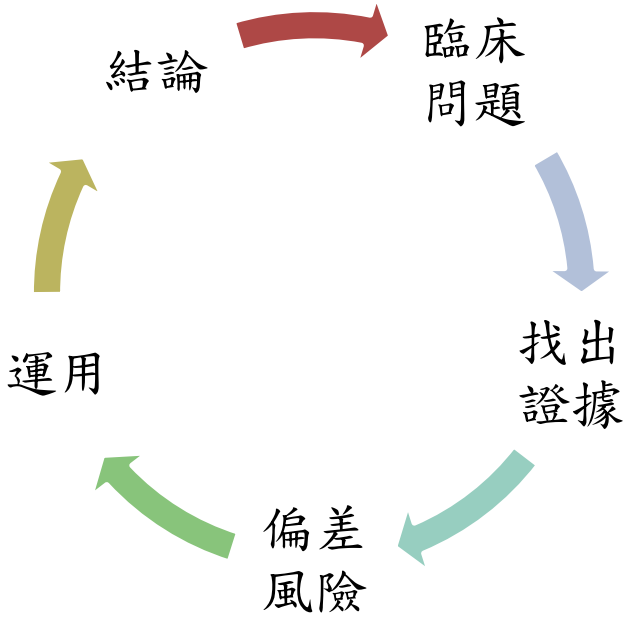

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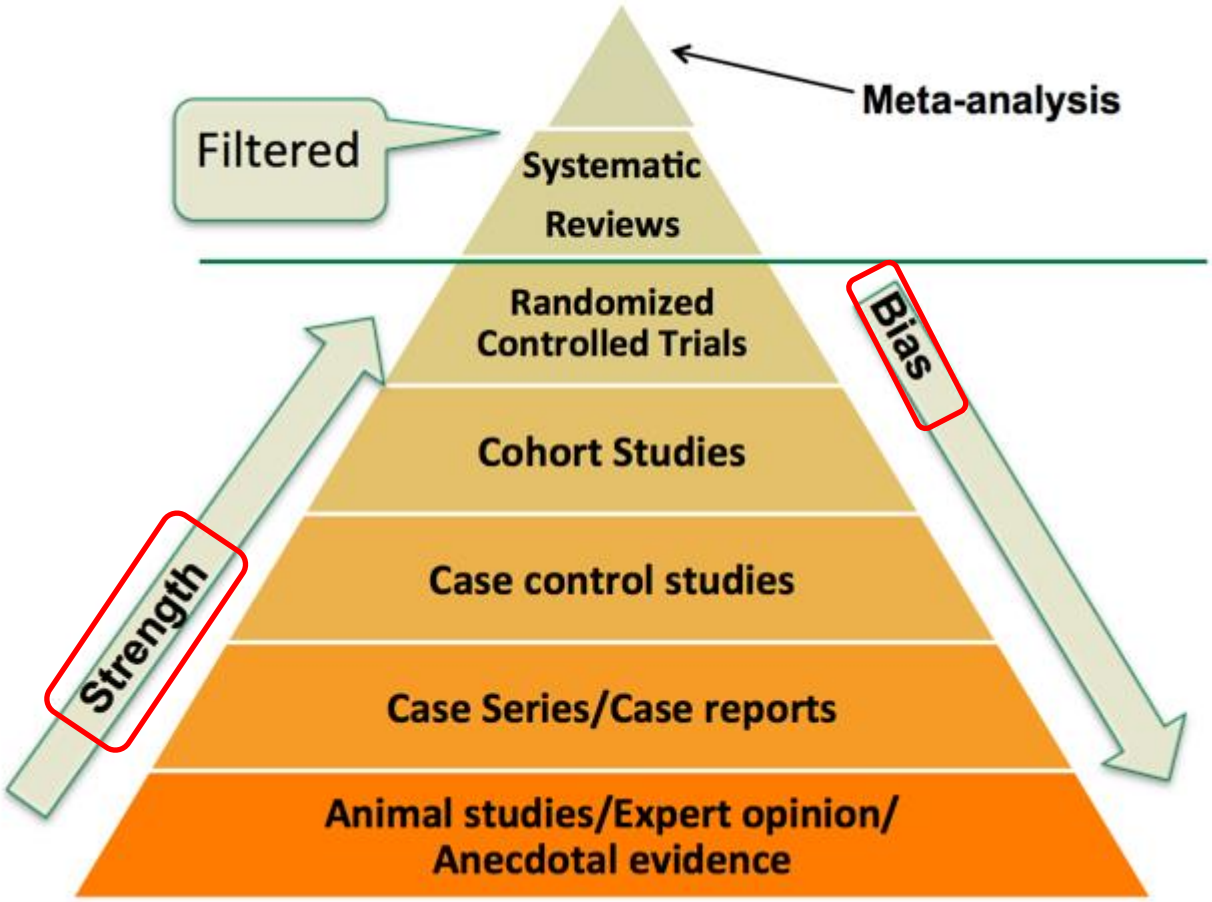

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Ann Intern Med.2009;151:JC3-2

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Topic Outline

INTRODUCTION
EPIDEMIOLOGY
EMBRYOLOGY
- Normal development
- Atrial septal defect

CLASSIFICATION
- Secundum defects
  - Genetic disorders
- Primum defects
- Sinus venosus defects
- Coronary sinus defects
- Patent foramen ovale

PATHOPHYSIOLOGY
- Perinatal physiology
- Postnatal physiology
- Associated cardiovascular defects

NATURAL HISTORY
- Spontaneous closure
- Persistent moderate to large ASDs

CLINICAL FEATURES
- Presentation
  - Prenatal
  - Postnatal
- General examination
- Cardiac findings
  - Precordial palpation
  - Heart sounds
    - Second heart sound
    - First heart sound
  - Heart murmurs
  - Pulmonary hypertension
- Extracardiac features
- Initial testing
  - Electrocardiogram
  - Chest radiograph

DIAGNOSIS

Classification of atrial septal defects (ASDs), and clinical features and diagnosis of isolated ASDs in children

Authors
G Wesley Vick, III, MD
Louis I Bezold, MD

Section Editor
John K Triedman, MD

Deputy Editor
Carrie Armsby, MD, MPH

說明疾病
好發族群
常見病因與危險因子
目前治療方式

INTRODUCTION

Atrial septal defects (ASDs) are common, accounting for approximately 13 percent of congenital heart disorders. The clinical consequences of an ASD are related to the anatomic location of the de
absence of other cardiac anomalies.

The classification of ASDs, and the clinical features and diagnosis of isolated ASDs in children will be reviewed here. The management and prognosis of children with isolated ASDs are discussed separately. (See "Management and outcome of isolated atrial septal defects in children".)

EPIDEMIOLOGY

Congenital defects of the atrial septum are common, accounting for approximately 13 percent of congenital heart disorders, with a reported birth prevalence of approximately 2 per 1000 live births [1-4].

EMBRYOLOGY

Normal development — The septation of the atria begins as early as the fifth week of gestation and involves three structures: septum primum, septum secundum, and the atrioventricular (AV) canal septum, which is made up in part by the superior and inferior endocardial cushion.

The septum primum arises from the superior portion of the common atrium and grows caudally towards the AV canal septum (eg, the endocardial cushions) located between the atria and ventricles. The fusion between the septum primum and the endocardial cushions closes the orifice (ostium primum) separating the right and left atria (figure 1).

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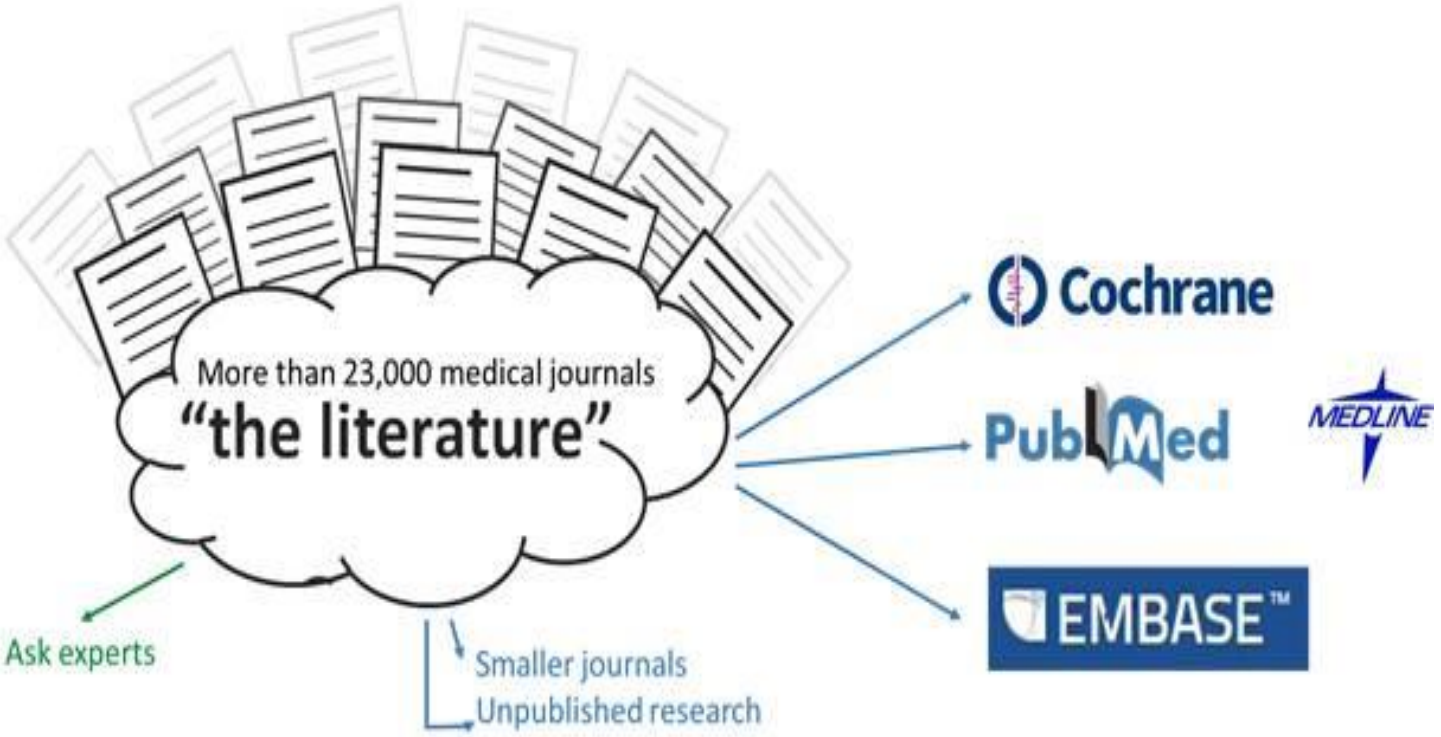
Search for the Best Evidence

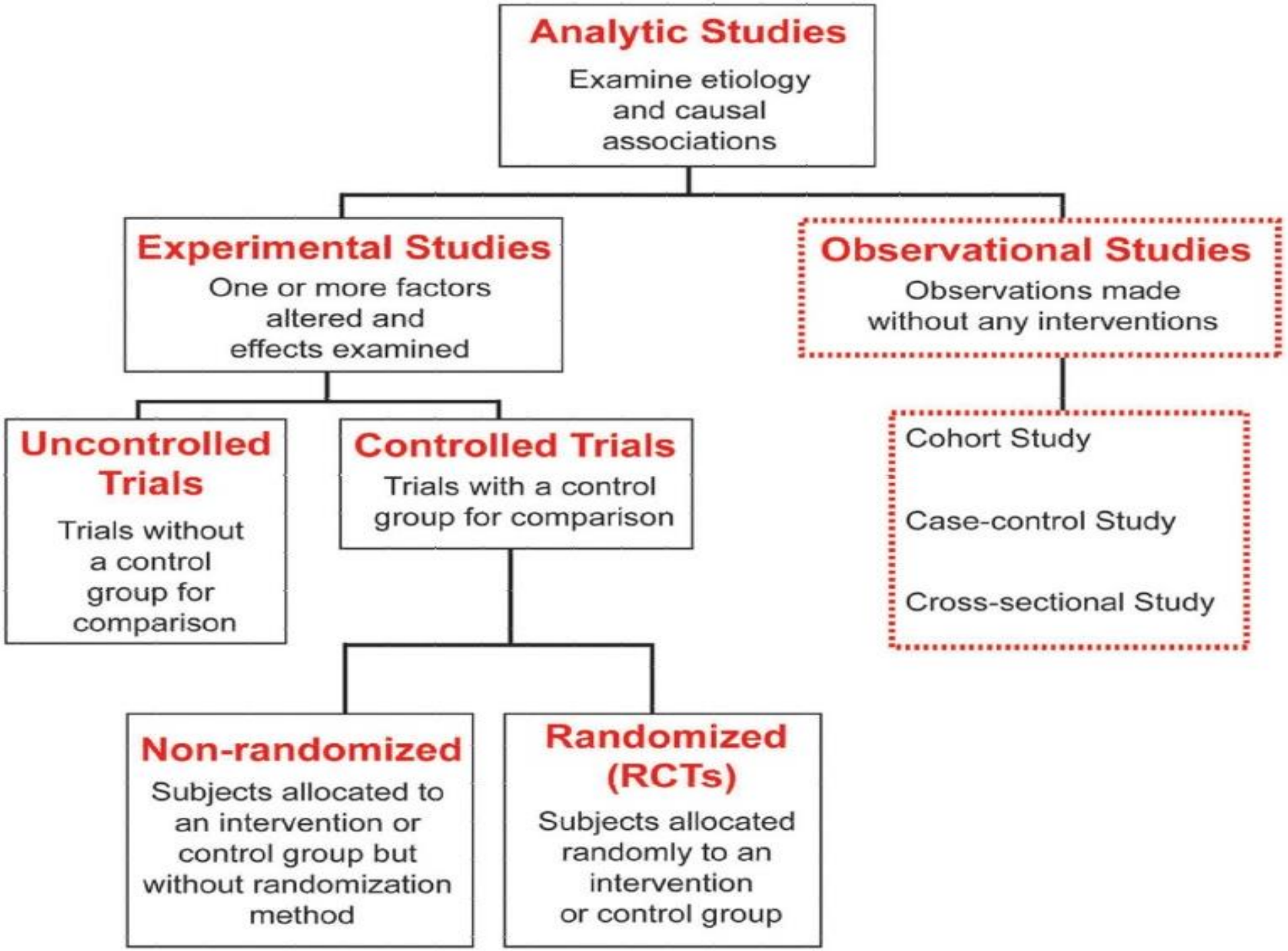
Search for the Best Evidence



How to choose the right format for your research?

➢ Here are some tips to help you choose the right format for your research.

- ✓ **Know** that the types of publications are different fields.
  Example :
  -social sciences > Empirical study
- ✓ **Remember** that not all journals publish all types of articles.
- ✓ **Look** at the journal's author guidelines for details about the types of articles accepted.
- ✓ **Speak** to your supervisors or senior colleagues for advice.



Adapted with permission from Joseph Eisenberg, Ph.D.

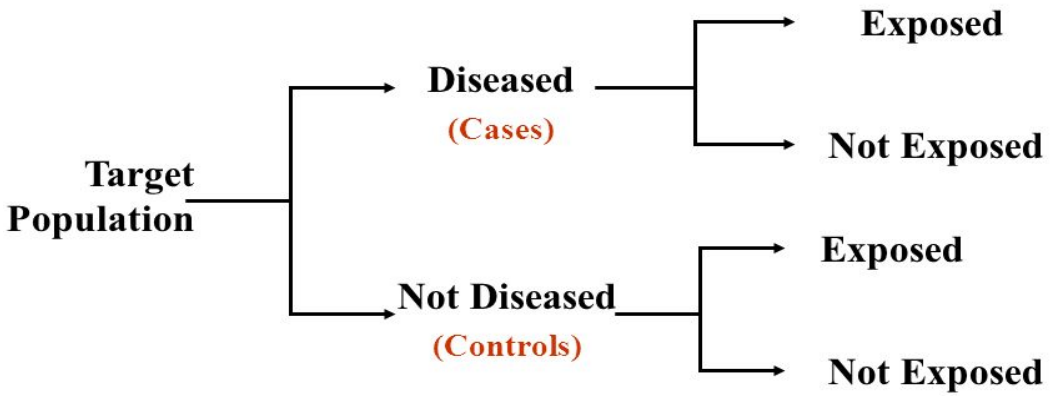
Study Type of Evidence Level

Question type (問題類型)	**Study design** （研究設計）
Diagnostic test 診斷性檢驗或檢查	Prospective, blinded cross-sectional study comparing with gold standard 前瞻性、盲法、與黃金標準進行比較之斷面研究
Prognosis 預後	Cohort study > Case control study > Case series study 世代研究 > 病例對照研究 > 病例系列研究
Etiology 病因	Cohort study > Case control study > Case series study 世代研究 > 病例對照研究 > 病例系列研究
Therapy 治療	Randomised control trial (RCT) 隨機對照試驗
Prevention 預防	Randomised control trial (RCT) 隨機對照試驗
Cost effectiveness 成本效益	Economic analysis 經濟分析

Definition of **Case control** & series

- A case-control study is a type of observational study in which two existing groups differing in outcome are identified and compared on the basis of some supposed causal attribute.

- Case-control studies are often used to identify factors that may contribute to a medical condition by comparing subjects who have that condition/disease (the "cases") with patients who do not have the condition/disease but are otherwise similar (the "controls").

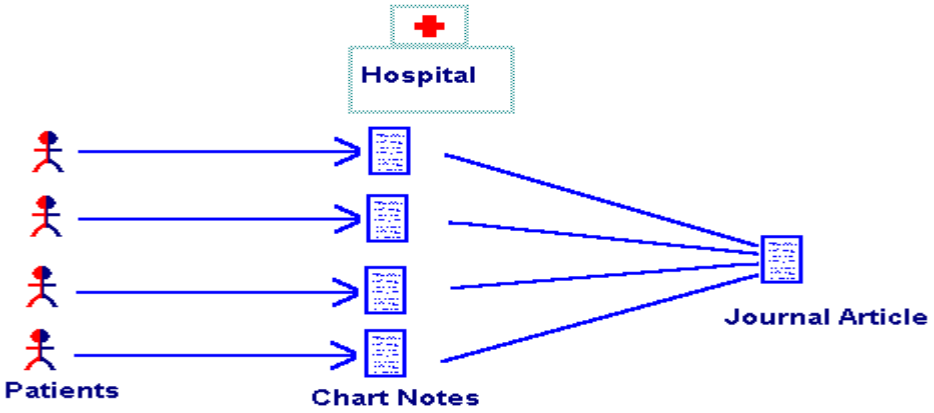


Emerg Med J 2003;20:54–60

Definition of Case control & **series**

- Case series have a descriptive study design; unlike studies that employ an analytic design (e.g. cohort studies, case-control studies or randomized controlled trails), case series do not, in themselves, involve hypothesis testing to look for evidence of cause and effect (though case-only analyses are sometimes performed in genetic epidemiology to investigate the association between an exposure and a genotype).

American Journal of Epidemiology. **144** (3): 207–13.



Definition of Cohort Study

- The term “cohort” is derived from the Latin word *cohors*.

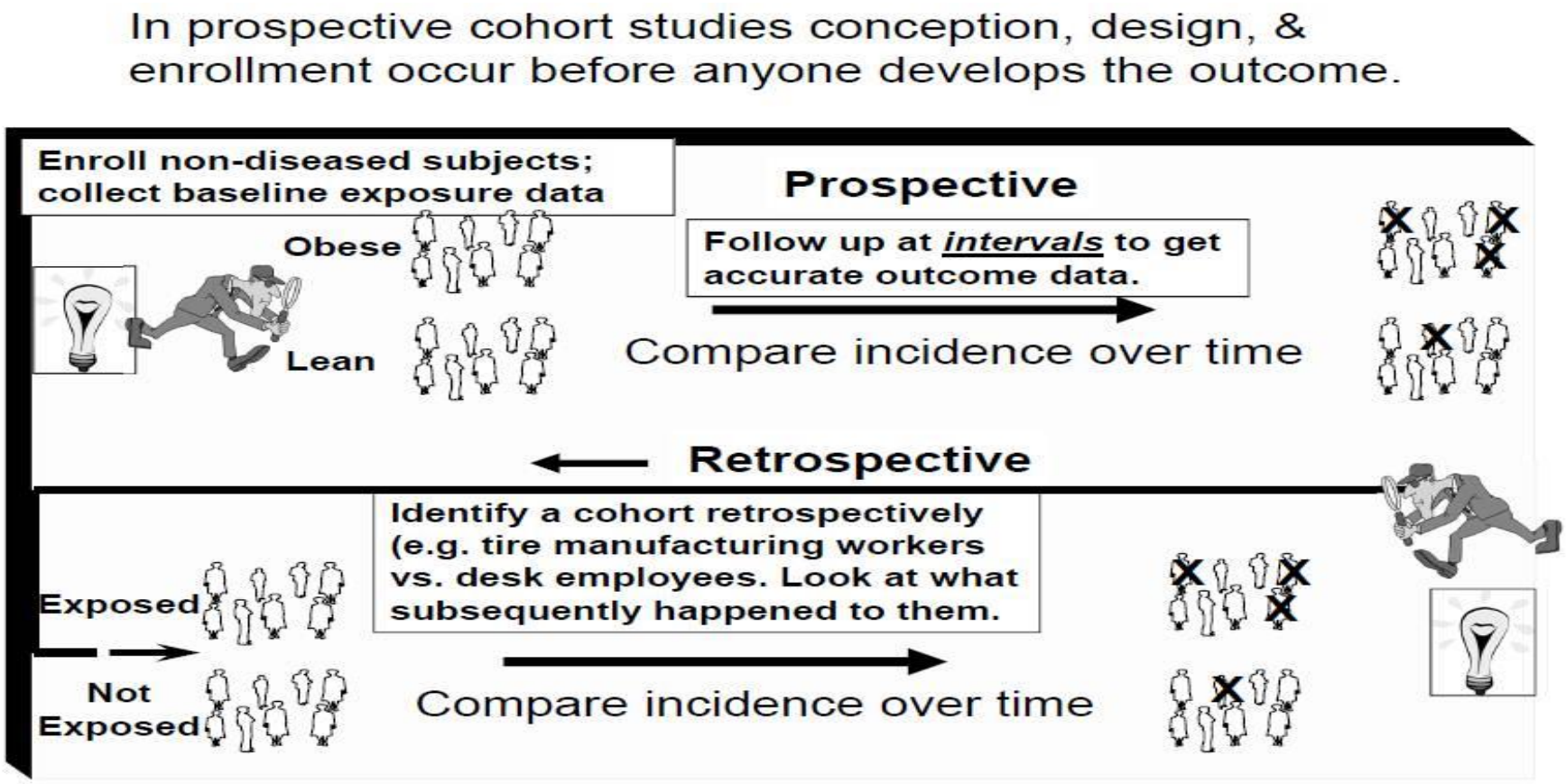
- The word “cohort” has been adopted into epidemiology to define a set of people followed over a period of time. W.H. Frost, an epidemiologist from the early 1900s, was the first to use the word “cohort” in his 1935 publication assessing age-specific mortality rates and tuberculosis.

- The modern epidemiological definition of the word now means a group of people with defined characteristics who are followed up to determine incidence of, or mortality from, some specific disease, all causes of death, or some other outcome.

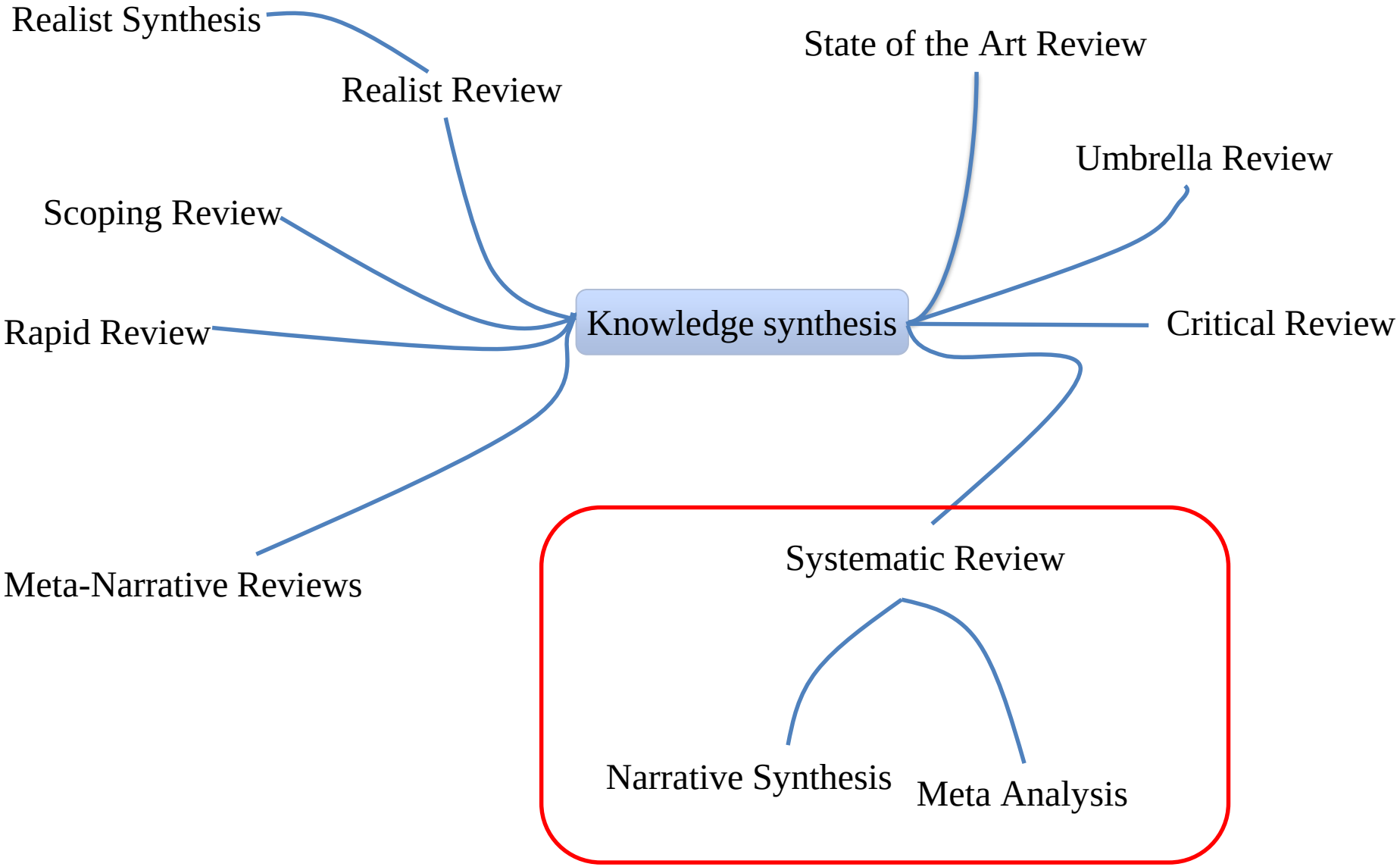
Plast Reconstr Surg. 2010 December ; 126(6): 2234–2242.

Definition of Cohort Study

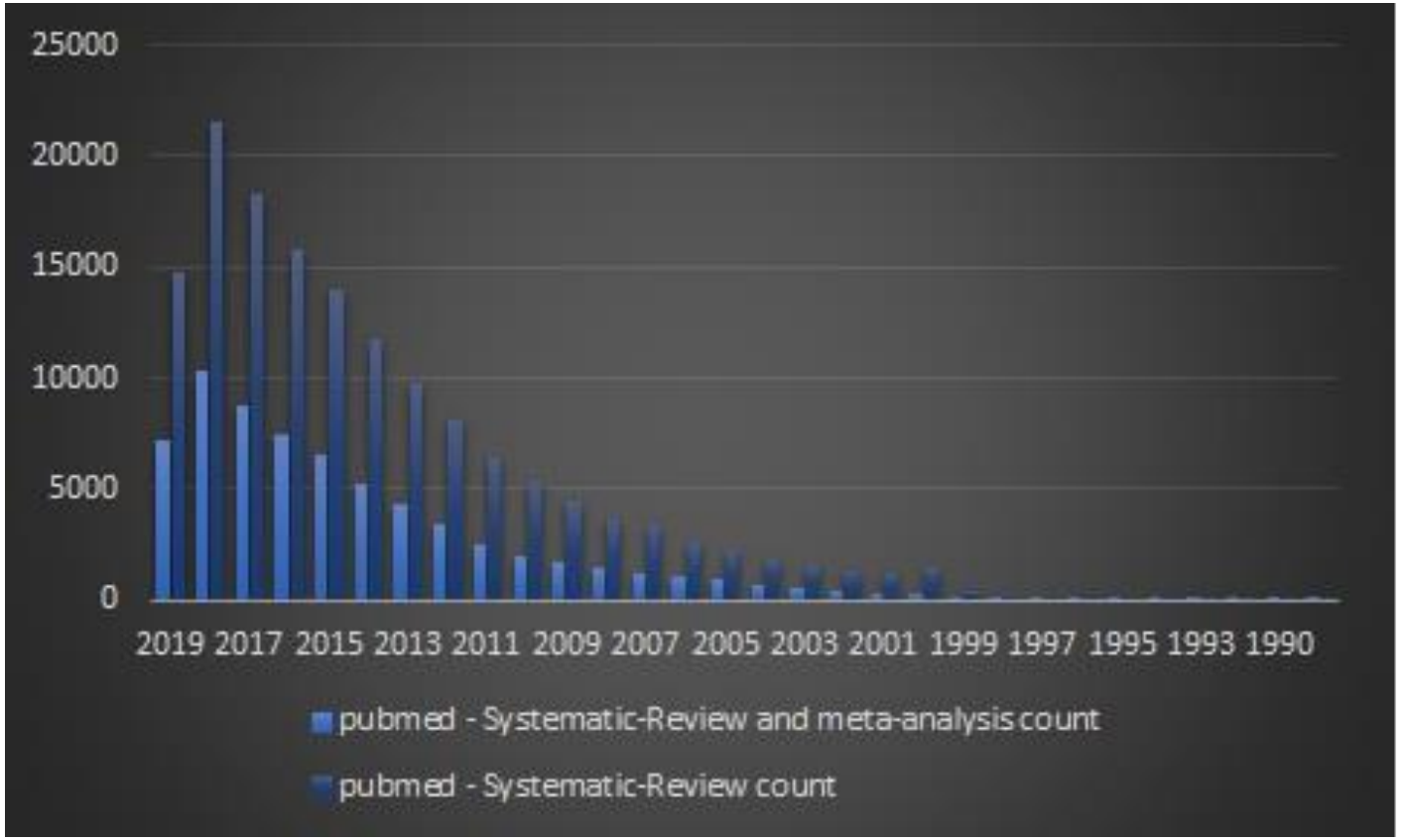
- ✓ More clearly established temporal sequence between exposure and disease.



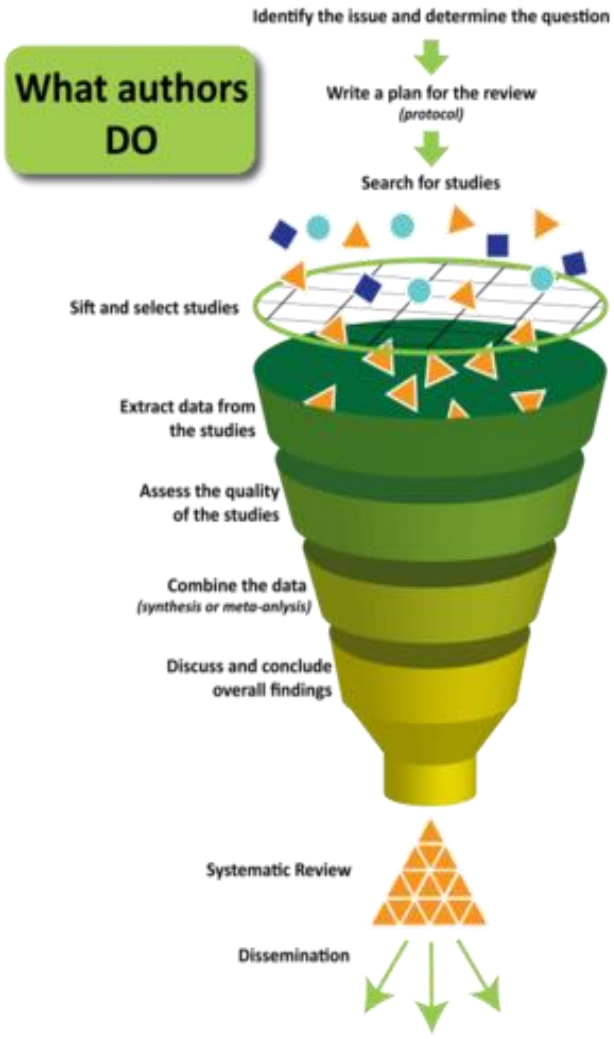
Type of review



SR and Meta-analysis publishing trends



Type of review articles-Systematic reviews



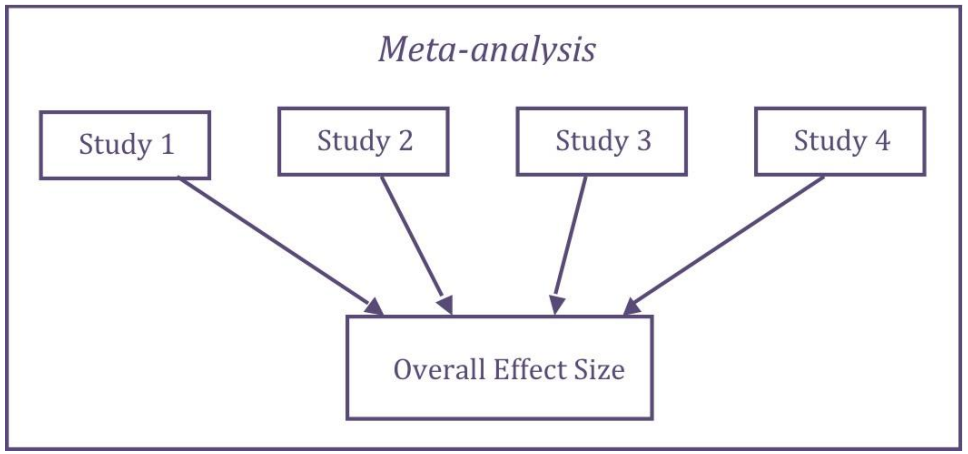
- ✓ Are more structured and rigorous than literature reviews.
- ✓ Address a clearly formulated question about the literature reviewed.
- ✓ Include reviews of published studies as well as gray literature (unpublished studies, reports , dissertations, conference papers and abstracts, governmental research, ongoing clinical trails.. .etc.)

Definition of Meta-analysis

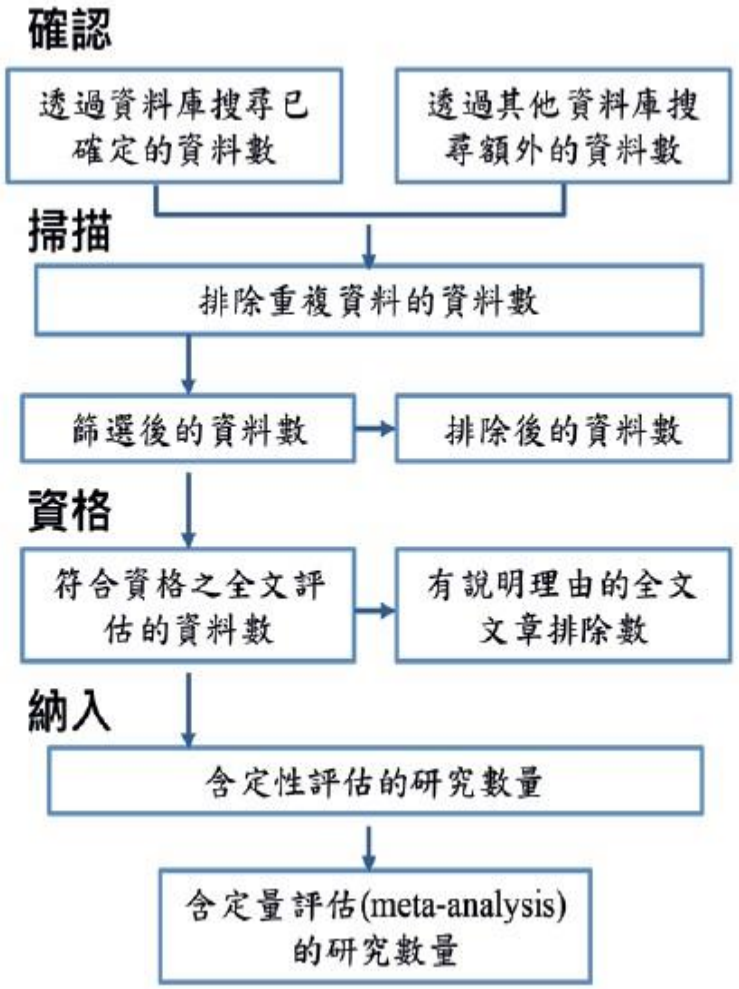
Meta-analysis is a quantitative approach for systematically combining results of previous research to arrive at conclusions about the body of research.

- ***Quantitative：numbers***
- Systematic：methodical
- Combining：putting together
- Previous research：what's already done
- Conclusions：new knowledge

In a Meta-analysis, each study becomes a subject in the new study. Therefore, the mean of study one becomes the score for subject one and so on.



Flow Diagram of Systematic Review



MRI and CT contrast media extravasation
A systematic review

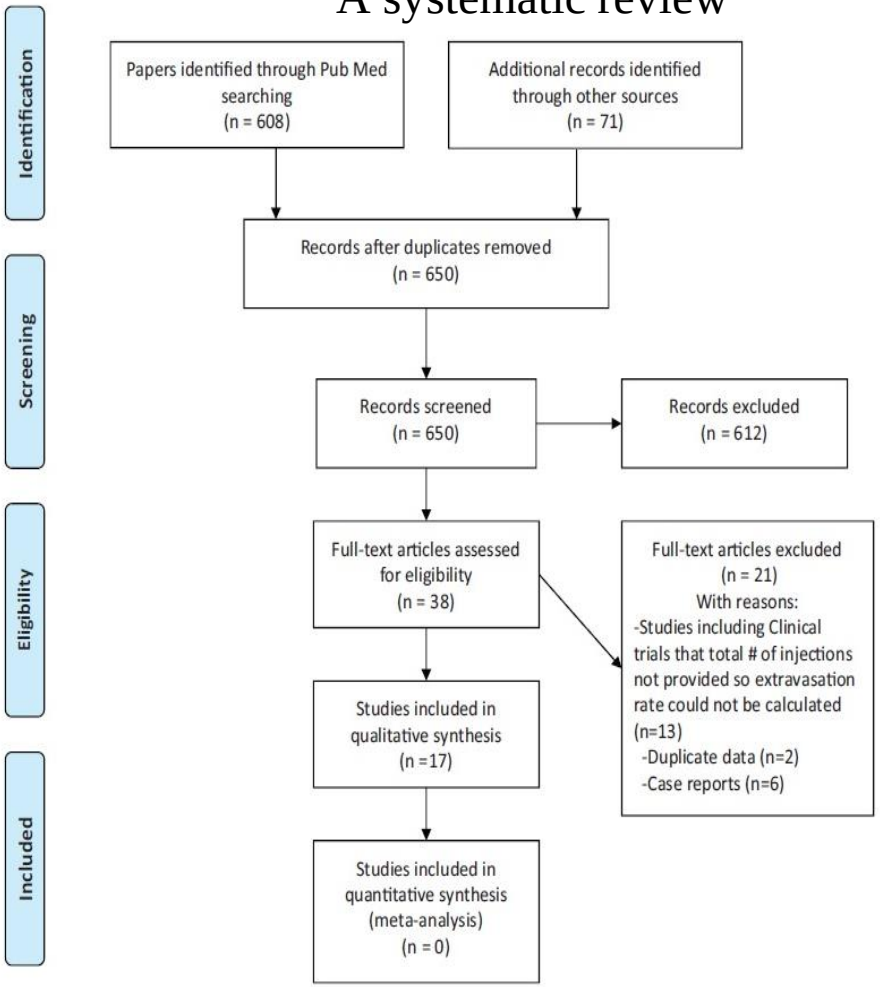


Figure 1. Flow chart shows papers selection criteria based on Preferred Reporting Items for Systematic Reviews guideline.

Medicine (Baltimore). 2018 Mar;97(9):e0055. doi: 10.1097/MD.0000000000010055.

Narrative reviews, systematic reviews and Meta-Analysis

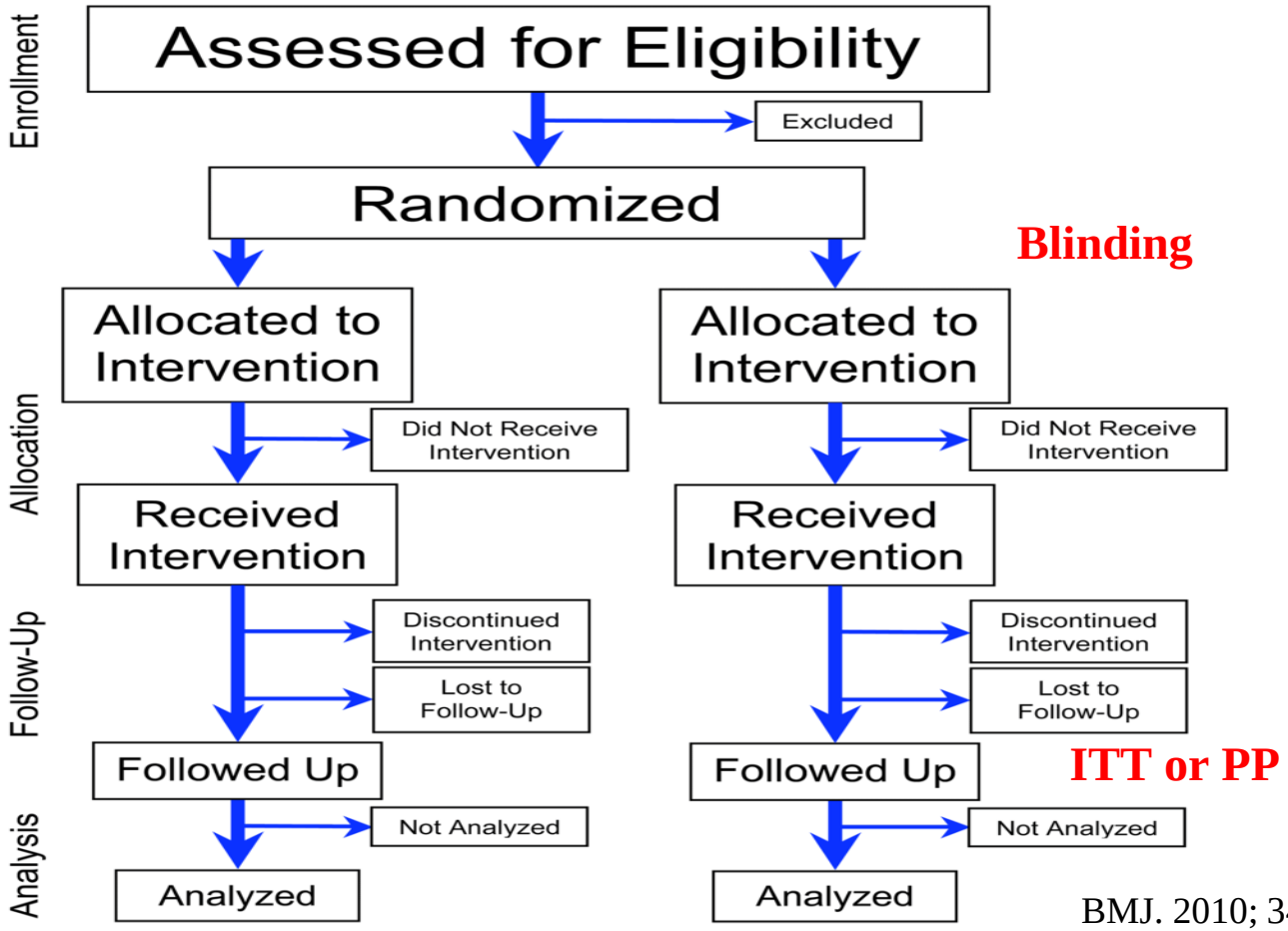
- ✓ Narrative Reviews : traditional expert review subjective, no formal rules in selecting studies, no standard statistical methods for combing studies.

- ✓ Systematic Review : review in which there is a comprehensive search for relevant studies on a specific topic and those identified are then appraised and synthesized according to a predetermined and explicit method.

- ✓ Meta-Analysis : systematic review that employs statistical methods (a quantitative summary) to combine and summarize the results of several studies.

Definition of Randomized controlled trial

RCT are quantitative, comparative, controlled experiments in which investigators study two or more interventions in a series of individuals who receive them in random order.



BMJ. 2010; 340: c332.

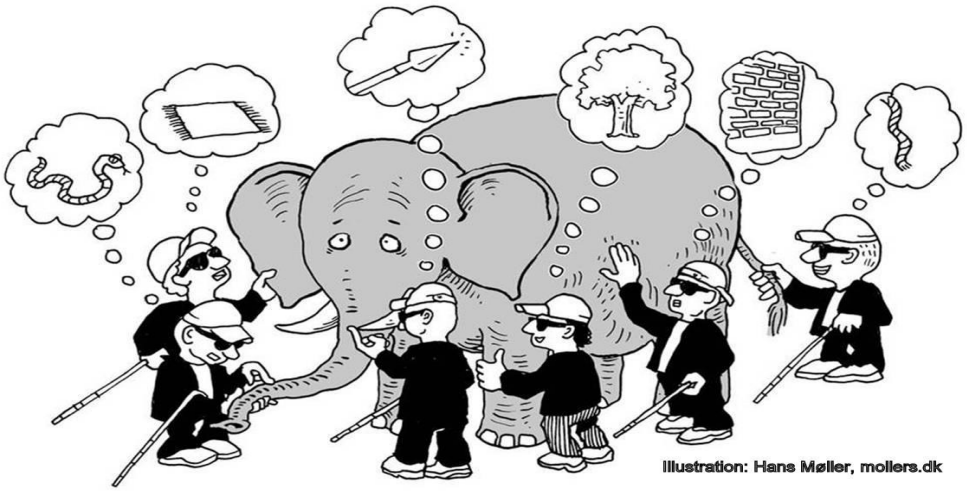
The RCT is one of the simplest and most powerful tools in clinical research.

What is a blinded study?

- This approach avoids bias because when people know what they are taking, it might change the way they react.

  - In a single blinded study, the patient does not know which arm of the protocol they have been assigned to.

  - Double blinded studies are those studies where neither the patient or the research physician know whether the patient is receiving the actual study drug or standard drug.



What is Bias?

Any trend in the collection, analysis, interpretation, publication or review of data that can lead to conclusions that are systematically different from the truth. Last, 2001

A process at any state of inference tending to produce results that depart systematically from the true values. Fletcher et al, 1988

Systematic error in design or conduct of a study. Szklo et al, 2000

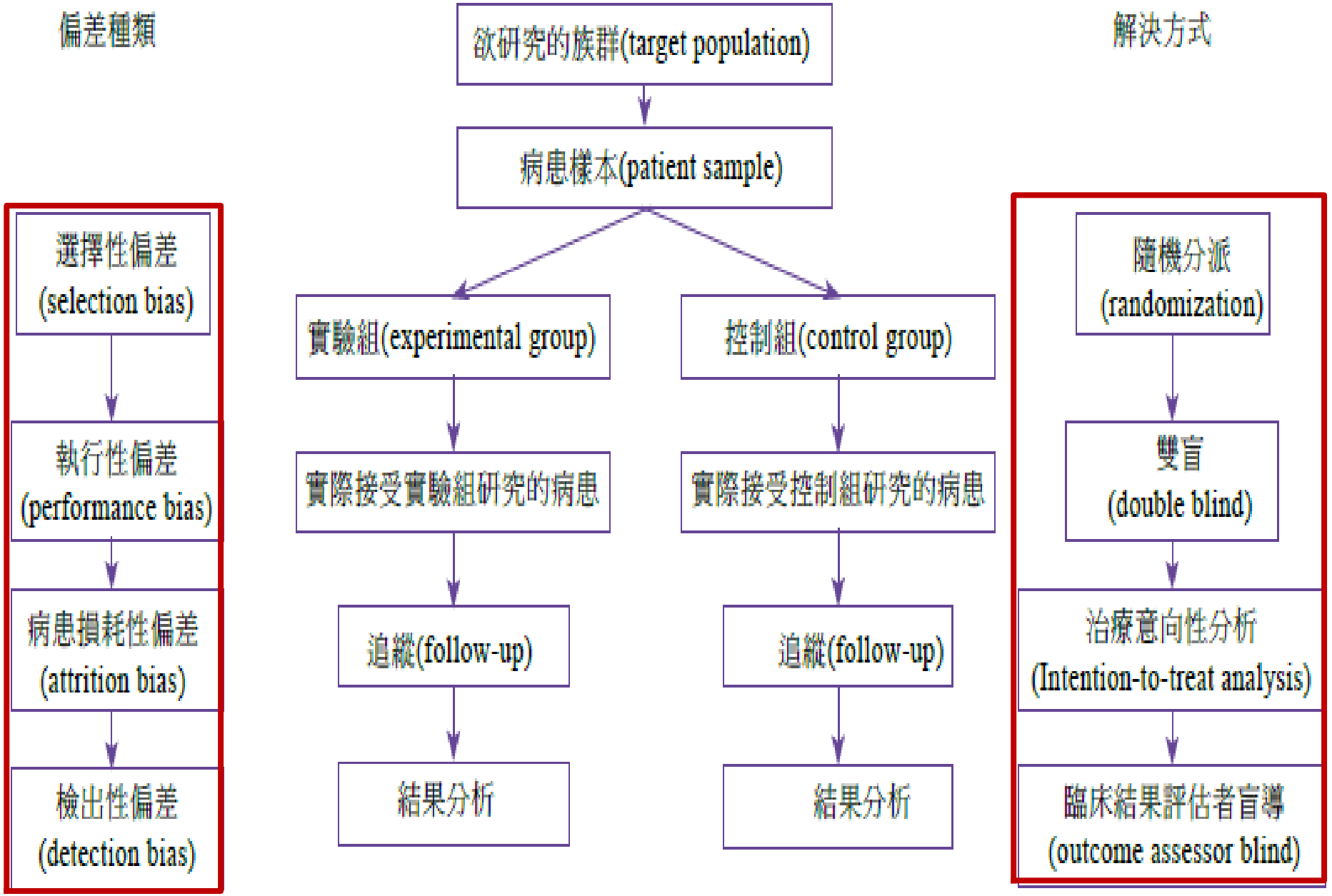
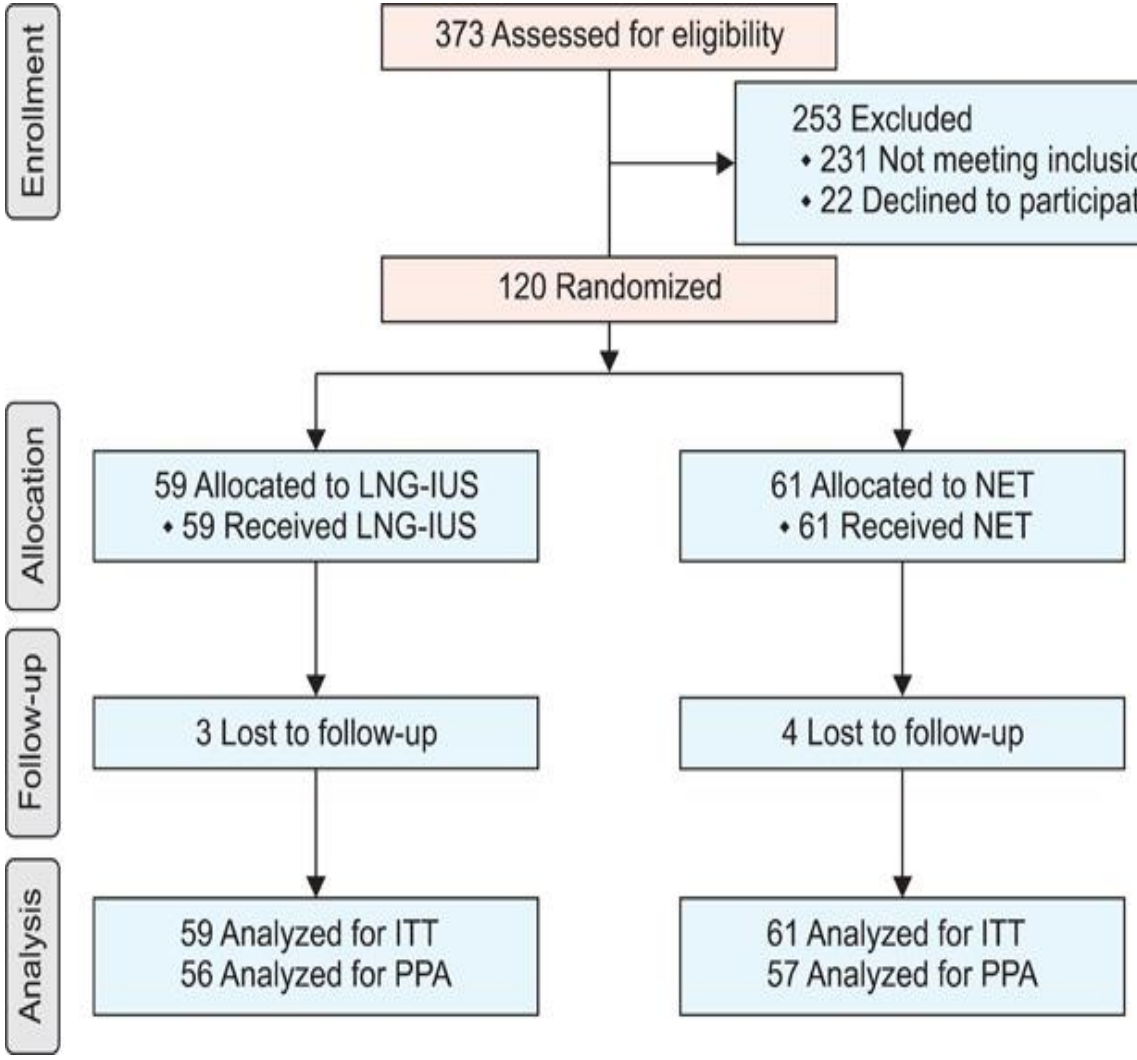
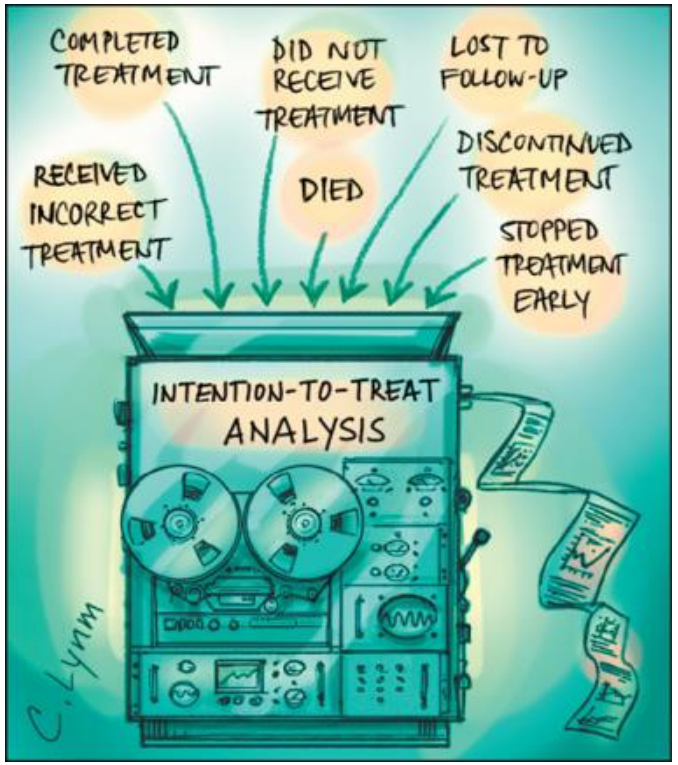


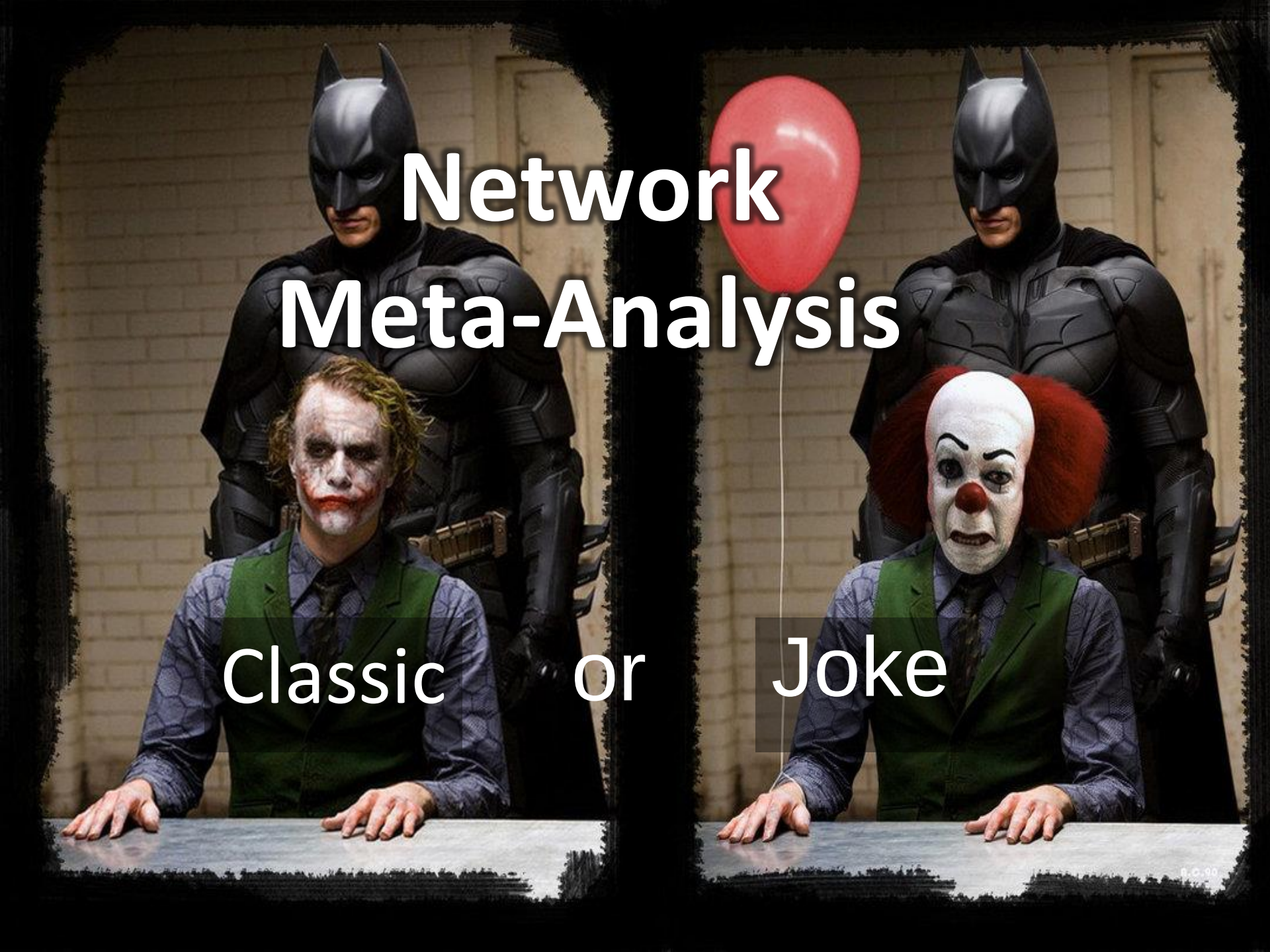
圖1 RCT研究的偏差來源及解決方式

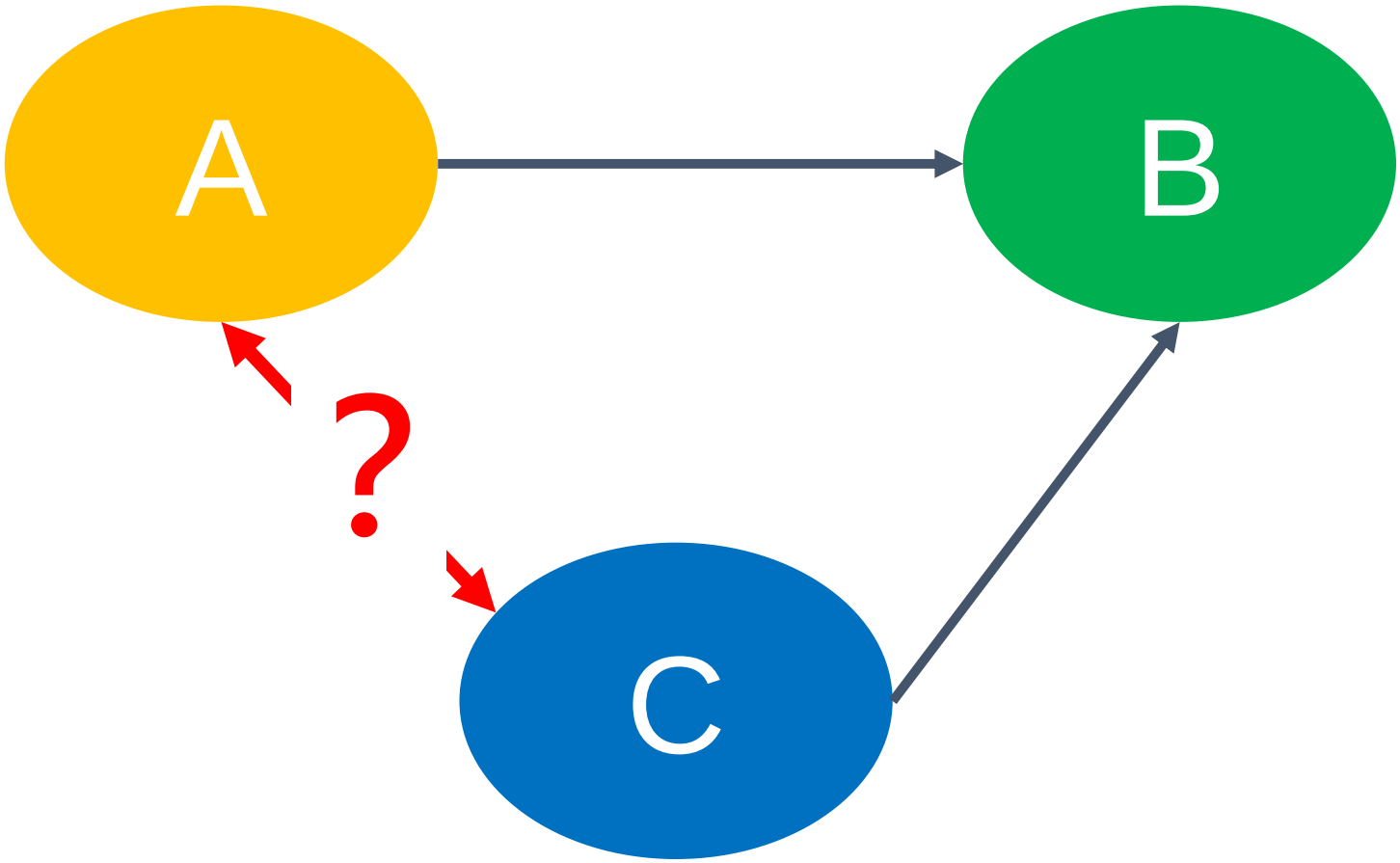
http://www.womencancer.com.tw/topic_r02.htm

Intention to treat (ITT) analysis and Per-protocol (PP) analysis

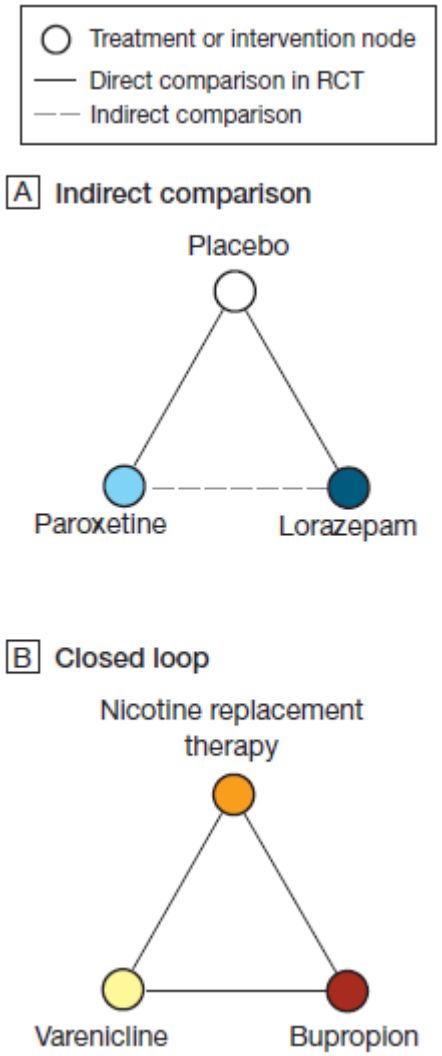





Network
Meta-Analysis
Classic
or
Joke


A
B
?
C

Net-work of Meta-ananlysis (NMA)



Advantages of NMA

- Comprehensive use of all available data (direct evidence + indirect evidence = mixed evidence)
- Comparison of interventions which haven't been directly compared in any trial
- Improved precision for each comparison
- Ranking of many treatments for the same condition

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