

實證醫學&實證檢驗醫學 (*EBM & EBLM*)

科室名稱：檢驗醫學科

報告日期：2021/8/06、13

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大綱

- 一. 實證醫學的歷史與定義
- 二. 為何要執行實證醫學
- 三. 實證醫學五步驟(問找評用審)

步驟1：以PICO模式問問題(Ask)

步驟2：實證搜尋(Acquire)

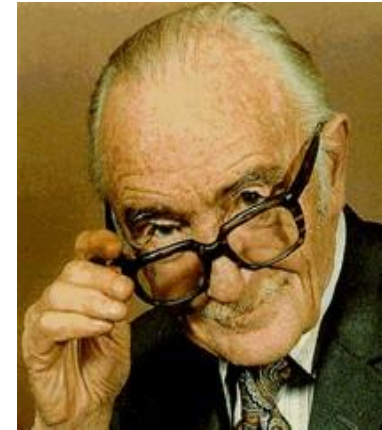
步驟3：嚴格評讀(APPRAISAL: VIP)

步驟4：恰當應用(APPLY: 3E)

步驟5：檢討和改善(Audit)



實證醫學的歷史



- 實證醫學的概念
 - Archie Cochrane (1909 –1988) 流行病學家
 - 1972 『Effectiveness and Efficiency: Random Reflections on Health Services』
 - 由於資源終將有限，所有的醫療行為都應該根據嚴謹的研究證據，才能將醫療資源做有效的應用
 - 並主張各專科醫師應該定期回顧最新的研究證據，摘錄整合其結果，其中來自於隨機對照試驗（Randomized Controlled Trials, RCTs）的證據，比其他任何證據更為可靠

實證醫學的歷史

- 1980年代David L. Sackett在加拿大McMaster大學成立 臨床流行病學與統計學的碩士課程
- 1991 Gordon Guyatt 提出“Evidence based medicine”

The Rational Clinical Examination

JAMA The Journal of the
American Medical Association

Evidence-Based Medicine

A New Approach to Teaching the Practice of Medicine

Evidence-Based Medicine Working Group JAMA 1992;268(17):2420-5.

A NEW paradigm for medical practice is emerging. Evidence-based medicine de-emphasizes intuition, unsystematic clinical experience, and pathophysiologic rationale as sufficient grounds for clinical decision making and stresses the examination of evidence from clinical research. Evidence-based medicine requires new skills of the physician, including efficient literature searching and the application of formal rules of evidence evaluating the clinical literature.

dose of phenytoin intravenously and the drug is continued orally. A computed tomographic head scan is completely normal, and an electroencephalogram shows only nonspecific findings. The patient is very concerned about his risk of seizure recurrence. How might the resident proceed?

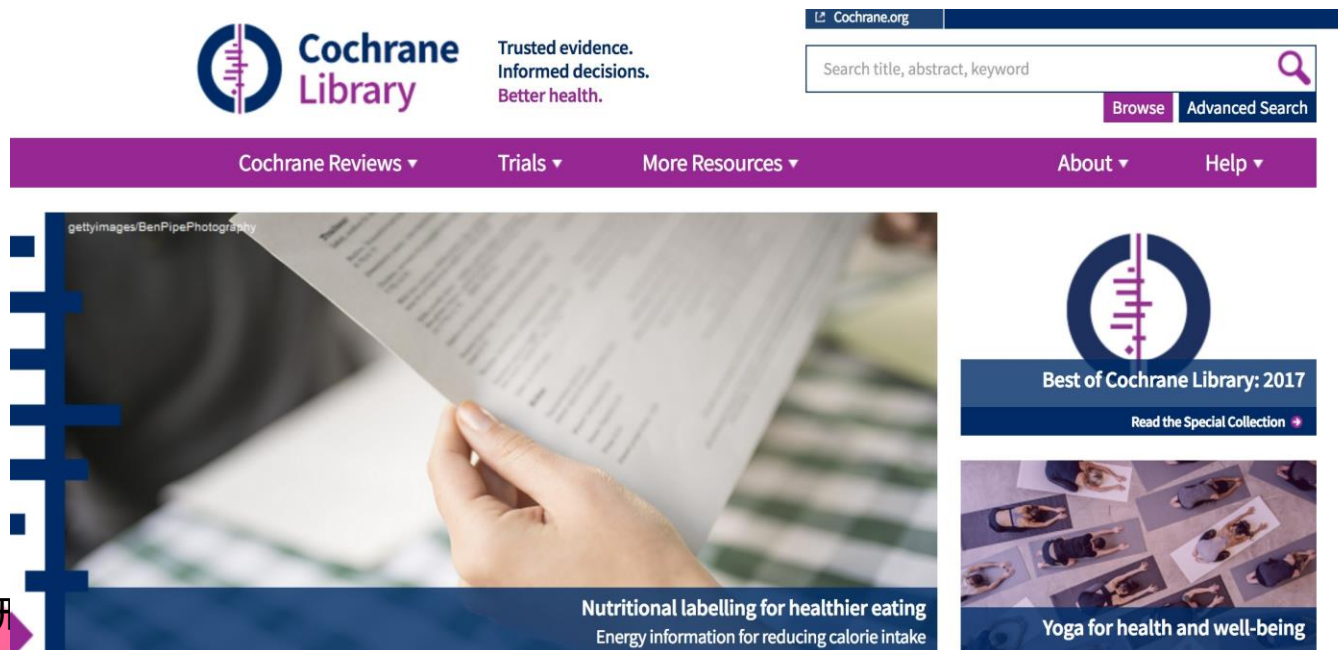
The Way of the Past

Faced with this situation as a clinical clerk, the resident was told by her se-

year is between 43% and 51%, and at 3 years the risk is between 51% and 60%. After a seizure-free period of 18 months his risk of recurrence would likely be less than 20%. She conveys this information to the patient, along with a recommendation that he take his medication, see his family doctor regularly, and have a review of his need for medication if he remains seizure-free for 18 months. The patient leaves with a clear idea of his likely prognosis.

實證醫學的歷史

- 1992年英國國家衛生部成立實證醫學中心
- 1993年Cochrane Collaboration成立
- 建立Cochrane Library: 實證醫學最重要的資料庫
Independent high quality evidence for health care decision making.



實證醫學的定義

實證醫學EBM (Evidence-Based Medicine)三要素~(3E)

實證醫學是從龐大的醫學資料庫中搜尋相關文獻，並以流行病學及統計學方法過濾出值得信賴的文獻，再經過嚴格評讀及綜合分析後，將所獲取之最佳研究證據(Evidence)、臨床專業(Expertise)及患者期望(Expectation)相互整合，制定出一套最佳的臨床醫療決策



實證檢驗醫學

EBLM (Evidence-Based Laboratory Medicine)

➤ 搜尋google學術搜尋

約有**2,380,000** 項符合 “Evidence-Based Laboratory Medicine 的查詢結果

➤ 搜尋PubMed

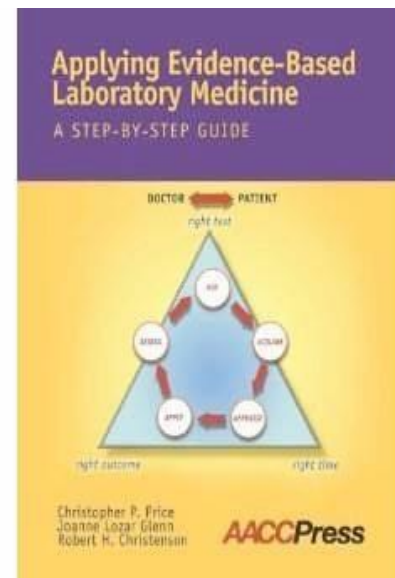
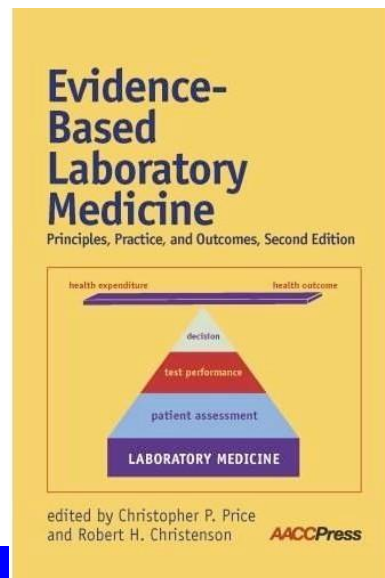
Evidence-Based Laboratory Medicine Field:Title共**5817**篇
最早**1999**年 **Moore RA**發表在[Am Clin Lab](#)
Concepts and principles of Evidence-Based Laboratory Medicine



實證檢驗醫學

EBLM (Evidence-Based Laboratory Medicine)

- 按照實證醫學 “以當前最佳證據為基礎” 的原則，規範檢驗醫學的研究、設計和文獻評價。
- 目的是向臨床提供**有效檢驗的證據**、提供最有利於醫病雙方的診斷試驗的診斷效能、成本-效果分析等資訊。
- 醫檢師不僅要向臨床醫師解釋檢驗項目的意義，而且要幫助他們**合理地選擇檢驗項目**。



為何需要EBM and EBLM?

- 實證醫學的理念是引用設計嚴謹、能直接解答臨床問題的文獻結果於實際患者的治療，並評估其療效，以改進醫療品質及資源運用，作為醫療決策之參考依據。
- 因應健保總額制度，醫院須制訂標準臨床指引，以減少不必要的(檢驗)醫療浪費，並確保病人的照護品質。
- 以problem-based learning(問題導向式學習)，面對臨床問題時，養成習慣且有效率的找出當今最佳解答。
- 以問題為導向(PBL)，證據為基礎，病人為中心的策略:

 **改善醫療品質與流程**

實證醫學五大步驟(5A)

提出問題(Ask: PICO)

- Formulate an answerable question

搜尋證據(Acquire)

- Track down the best evidence

嚴格評讀(Appraisal: VIP)

- Critically appraise the evidence

恰當應用(Apply: 3E)

- Integrate with clinical expertise and values

評估結果(Audit)

- Monitoring your performance



實證醫學步驟

實證醫學步驟 - 從問題到應用

提出問題 → 將臨床問題改寫為「PICO」 → 檢索資料庫/挑選文獻 → 嚴格評讀文獻 → 決定證據等級/做出建議



步驟1: (Ask) 以PICO模式問問題



提出問題(ASK: PICO)

~ 厘清問題 ~



最終目標:解決臨床問題

背景問題---不需實證探討

與疾病相關的基本知識--5W1H

- 誰(Who)：哪類病人容易得烏腳病？
- 什麼(What)：什麼是烏腳病？
- 哪裡(Where)：哪裡的人比較容易得烏腳病？
- 何時(When)：什麼年紀的人比較會得烏腳病？
- 為何(Why)：為什麼會得烏腳病？
- 如何(How)：烏腳病如何形成？



前景問題---需實證探討

◆與臨床決策或行動相關的特定問題

- 瞭解相關背景知識才能提出較深入的前景問題
- 以PICO將問題結構化
- 判別問題類型

1. 治療型(Therapy)

2. 預後型(Prognosis)

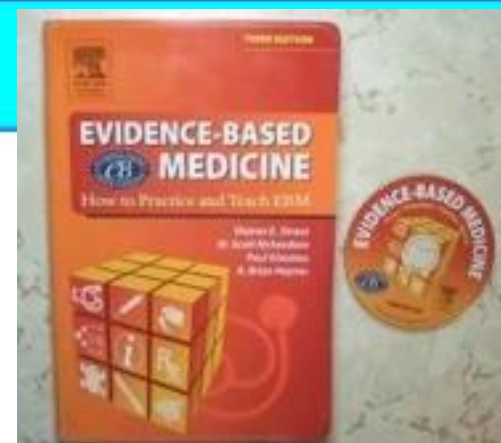
3. 傷害型(Harm)

4. 診斷型(Diagnosis)

CD Contents: Book

- Preface
- Acknowledgements
- Introduction
- 1. Asking answerable clinical questions
- 2. How to find current best evidence *and have current best evidence find us*
- 3. Diagnosis and screening
- 4. Prognosis
- 5. Therapy
- 6. Harm
- 7. Guidelines
- 8. Teaching Methods
- 9. Evaluation
- Appendix 1: Confidence Intervals
- Appendix 2: Glossary

4大問題



判別問題類型

- ◆ **治療型** : 給措施後的效果/不同措施的效果
- ◆ **預後型** : 隨時間發展，某特定疾病可能的病程、併發症或疾病對未來健康、壽命的影響
- ◆ **傷害型** : 不希望出現的效果
- ◆ **診斷型** : 特定檢查可信度及臨床效度如何，通常與黃金標準檢查*作比較

檢驗主要在診斷型

※ 黃金標準檢查指的是目前最具信效度而足以確定診斷的方式

以PICO將問題結構化

P	病人 Population	病人是誰/何種問題？
I	介入措施 Intervention	臨床治療處置、診斷工具、暴露史 是什麼？
C	比較措施 Comparison	與臨床介入比較的對照介入 (安慰劑、常規照護或另一個處置)
O	結果 Outcomes	結果是什麼？(要具體) (可測量的生理/心理指標或發生率)

PICO可以協助我~~~

1. 聚焦問題、找到搜尋關鍵字
2. 分辨臨床問題型態
3. 找尋最佳的研究設計的文獻

判別問題類型 ~ 1

◆ 治療型 : 給措施後的效果/不同措施的效果

◆ 運動是否可以改善化療病人疲倦感

◆ 彈力帶運動是否較快走提升居家老人下肢肌力



情境1:

68歲病患，剛接受腹部手術，醫師叮嚀他暫時不要由口進食，要等排氣後再開始少量飲食；但他聽說：『腹部開刀患者可以在手術後嚼口香糖，使腸胃蠕動增加，減少腸沾連，幫助術後早日排氣進食』，到底他該不該嚼口香糖呢？

背景問題厘清(確認問題合理性)

- ✓ 腸阻塞：腹部手術後常見的問題
- ✓ 口香糖：假性進食，刺激胰液、唾液分泌和促進腸胃功能



形成實證問題

咀嚼口香糖對腹部手術後病人腸道功能恢復之成效

P	腹部手術後病人
I	咀嚼口香糖
C	未咀嚼口香糖
O	腸胃蠕動、排氣、住院天數、醫療花費

問題類型:

☒ 治療型

☐ 預後型

☐ 傷害型

☐ 診斷型

情境2:

處理**燒燙傷**傷口對患者是非常痛苦的經驗，除了止痛藥，越來越多研究建議應搭配非藥物措施，如介入『**虛擬實境**』**遊戲**於換藥過程以**減輕換藥疼痛**，但是虛擬實境設備成本高，因此需提出實證成效才能說服醫院管理者購置此設備。



背景問題厘清(確認問題合理性)

- ✓ 虛擬實境遊戲：透過各種感應裝置於虛擬環境中進行遊戲，達到注意力轉移，暫時脫離苦痛感受

形成實證問題

運用虛擬實境遊戲是否降低燒燙傷患者換藥疼痛

P	燒燙傷患者
I	虛擬實境遊戲
C	傳統照護
O	換藥疼痛

問題類型：

- ☒ 治療型
- ☐ 預後型
- ☐ 診斷型
- ☐ 傷害型

判別問題類型 ~ 2

◆ 預後型：隨時間發展，某特定疾病可能的病程
、併發症或疾病對未來健康、壽命的影響

◆ 二尖瓣脫垂婦女發生心內膜炎的風險

◆ 糖尿病患者合併高血壓對心血管事件的發生率

情境3:

一位曾經罹患缺血性中風的75歲男性長者已出院2個月，右邊患側仍較乏力，持續進行藥物及復健治療，今日返回門診追蹤時，他告訴醫生報紙上有一篇報導提到，中風後發生癲癇的機率會增加，他很怕自己發生這狀況。你該如何回應他？



背景問題厘清(確認問題合理性)

- ✓ 中風倖存者因為腦細胞受損也可能成為癲癇的高危險群

形成實證問題

針對有中風病史的老年人而言，合併發生癲癇的風險是否會增高？

P	75歲男性長者
I	中風病史
C	無中風病史
O	癲癇發生率

問題類型:

☐ 治療型

☒ 預後型

☐ 傷害型

☐ 診斷型

判別問題類型 ~ 3

◆ 傷害型 : 不希望出現的效果

◆ 停經婦女使用荷爾蒙治療是否增加乳癌機率



情境4:



陳女士，乳癌病人，預計進行化療。她擔心化療會掉光頭髮而遭受異樣眼光，因此上網搜尋，看到化療病人戴冰帽可減緩掉髮的信息，但也有人提到戴冰帽可能會讓癌細胞轉移頭皮上，所以她很好奇冰帽的效果及風險。

身為醫護人員，您可以提供她一些正確訊息嗎？

背景問題厘清(確認問題合理性)

- ✓ 乳癌化療藥物具細胞毒性，易使得頭髮受損及大量掉髮
- ✓ 戴冰帽：暫時性的低溫會讓血管收縮而降低血流，進而降低細胞攝取化療藥物的濃度

形成實證問題

進行化學治療病人頭戴冰帽是否

會影響掉髮及頭皮腫瘤轉移？

P	化學治療病人
I	戴冰帽
C	傳統照護
O	掉髮 頭皮腫瘤轉移

問題類型：

☐ 治療型

☐ 預後型

☒ 傷害型

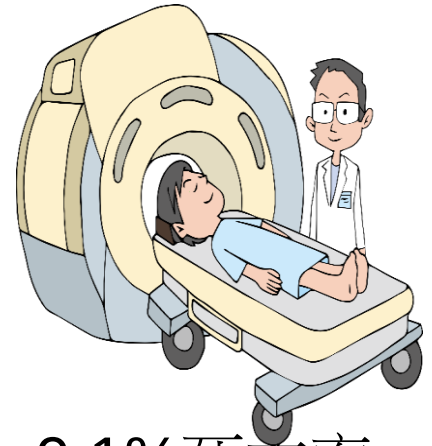
☐ 診斷型

判別問題類型 ~ 4

- ◆ 診斷型 : 特定檢查可信度及臨床效度如何
通常與黃金標準檢查作比較
- ◆ 針對中風病人，頸動脈雜音是否較頸動脈杜普勒超音波檢查能預測病人患有頸動脈狹窄？

情境5:

李先生，65歲，患有高血壓及糖尿病，最近常感胸口煩悶，尤其是早晨或運動後，懷疑是心絞痛被診所醫師轉介至醫院做進一步檢查。到醫院後，醫師表示要判斷是否有冠狀動脈阻塞，最準確的診斷方法為心導管檢查，但風險較高。建議可先做非侵入性檢查：心臟64切電腦斷層掃描。



背景問題厘清(確認問題合理性)

- ✓ 黃金標準檢查：心導管檢查，為侵入性檢查，0.1%死亡率
- ✓ 心臟64切電腦斷層掃描：可清晰檢視血管腔狹窄程度

形成實證問題

有心絞痛症狀患者採心臟64切電腦斷層掃描是否
較心導管檢查更能準確判斷冠狀動脈阻塞情形？

P	有心絞痛症狀
I	心臟64切電腦斷層掃描
C	心導管檢查
O	判斷冠狀動脈阻塞的最佳工具

問題類型：

☐ 治療型

☐ 預後型

☐ 傷害型

☒ 診斷型

Q:實驗室常面臨**哪些**臨床問題(檢驗諮詢)?



帥氣主治醫師

我覺得可以試試diosmectite(Smecta) ·
應該會有效



小鮮肉住院醫師



藥師

益生菌只在腹瀉發生前有效，腹瀉一但
發生再使用就沒有效了



營養師

益生菌還是有效，但是劑量要夠大



臨床情境～ 1

檢驗醫學科接到臨床醫師諮詢電話：

- 目前肺結核病的診斷有賴於細菌培養。但細菌培養在急需確診和治療的病人身上常緩不濟急。
- 所以檢驗科可否可引進**Interferon- γ release assay (IGRA)** 的檢驗，以幫助臨床醫師快速診斷active tuberculosis?

所形成的臨床問題

臨床單位的訴求

想新增檢驗項目IGRA

- 可快速檢驗
- 檢體為血液(或體液)
- 幫助醫師及早診斷和治療

檢驗單位的疑問

我們目前用來診斷TB的指標有哪些?

IGRA對於active TB的診斷是否有足夠的證據支持?

若真的要新增此檢驗項目，設備及試劑成本如何?是否有健保給付?

→ IGRA是否適用來診斷active TB?

Background Questions

- **Interferon- γ release assay (IGRA)**是甚麼?
- 診斷active TB的檢驗項目有哪些?
- 診斷active TB gold standard是甚麼?
- 目前本院用的指標有哪些?

Foreground Questions

形成實
證問題

Asking

- 將臨床問題寫成PICO

IGRA在診斷active TB的能力如何?

P	A patient is suspected active TB
I	Interferon- γ release assay (IGRA)
C	Bacterial culture (gold standard)
O	Diagnosis accuracy for active TB

臨床情境～2

Can I use the plasma BNP test to rule-in or rule-out decompensated heart failure in patients presenting with dyspnea to urgent care ?

- 我可以檢測BNP來排除因呼吸困難而需要緊急照護的患者的代償不全性心力衰竭嗎？

Foreground Questions

Asking

– 將臨床問題寫成PICO

P	dyspnea patient with DHF
I	BNP (B-Type Natriuretic Peptide)
C	dyspnea patient without DHF
O	Diagnosis of DHF Stay in ER

臨床情境～3

➤ 一位腎臟科醫師最近讀了些有關腎衰竭病人偵測 **Cystatin C test** 的研究論文，打電話問檢驗科 **Cystatin C test** 是否比傳統 **serum creatinine**，能更早偵測到 **腎移植病人因排斥** 造成的腎小球過濾速率變差。

➤ **PICO?**

Foreground Questions

Asking

– 將臨床問題寫成PICO

P	
I	
C	
O	

Foreground Questions

Asking

– 將臨床問題寫成PICO

P	腎移植術後出現排斥反應的患者
I	Serum Cystatin C test
C	serum creatinine
O	與 GFR 比較的診斷準確度



~ 休息一下

待續.....



~ 一起學習成長

步驟2：實證搜尋(Acquire)

Track down the best evidence



搜尋證據(ACQUIRE)

- 資料庫種類

- 教科書、電子書

- Background question

- 醫學期刊、電子期刊、電子資料庫

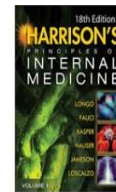
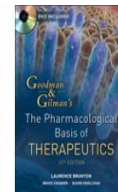
- Review article for background question

- Original article for foreground question

- 實證醫學文獻資料庫

- Cochrane Library、ACP journal club、Bandolier 等

- 由各領域專家利用系統性回顧的技術，蒐集最新 正確的醫學證據，來回答臨床問題



搜尋證據(ACQUIRE)

檢索策略

2 → 1: 不要只搜尋1個資料庫

你需要的答案大部分在**方法**和**結果**



搜尋證據(ACQUIRE)

- 文獻檢索目標



最符合臨床問題

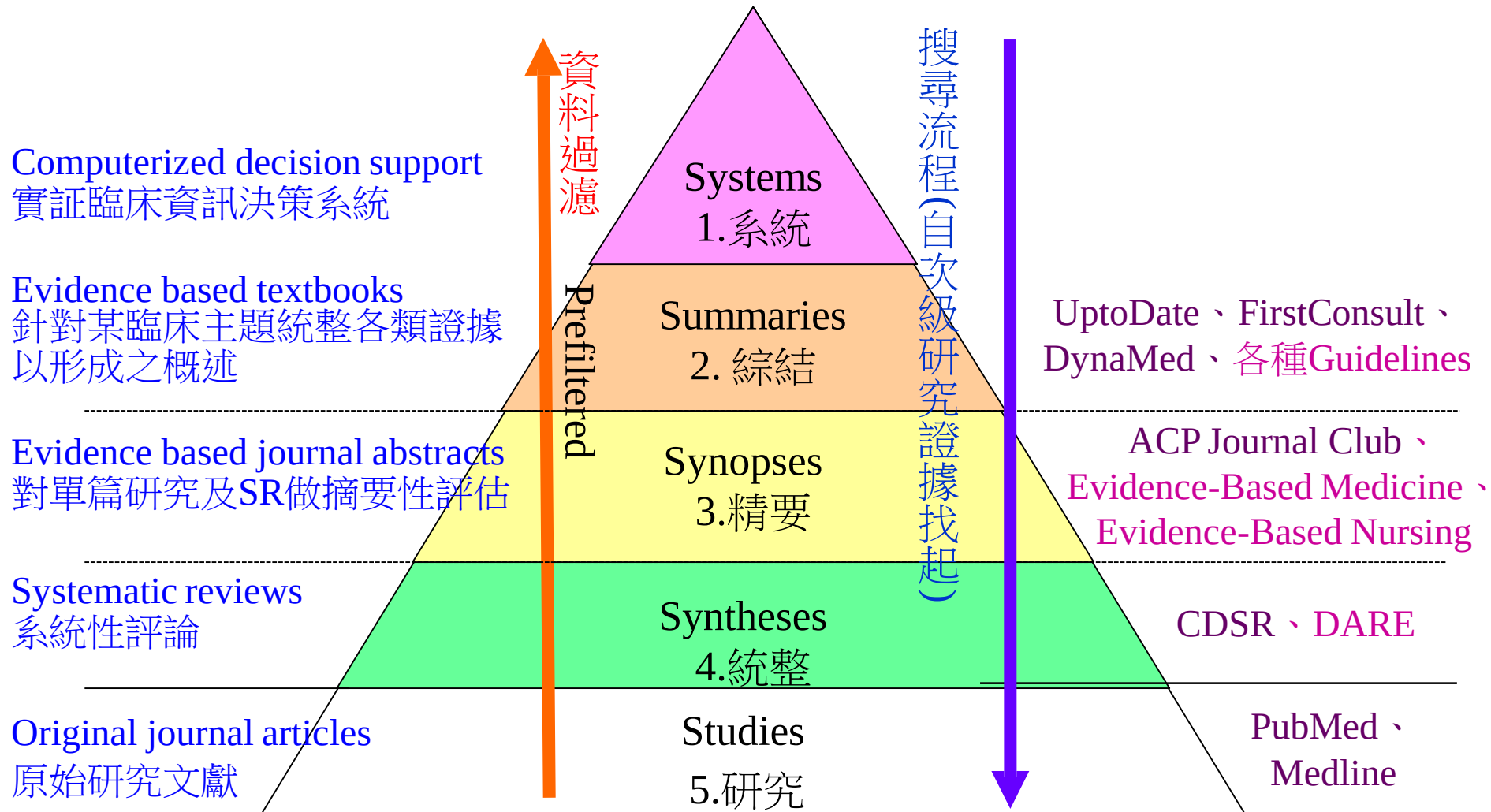
最佳的研究設計

文獻等級

發表年份較新

有全文可供評讀

EBM Resources (5S)



EBM Database

二次研究證據 (已經整理的文獻)	1.System系統	
	2.Summaries摘要 - for背景知識	(1) Evidence-based CPG (free) (2) Best Practice-Clinical Evidence (3) UpToDate (4) ACP Pier & ACP Medicine (5) FirstConsult (6) DynaMed (7) Medscape-eMedicine (free)
	3.Synopses精要 (Article Review) - for背景知識	(1) ACP Journal Club (2) Evidence-based Medicine (free) (3) Evidence based – xxx的期刊
	4.Syntheses統整 (Systematic Review) - for證據評讀	(1) The Cochrane Library - CDSR & Other Reviews (中文版摘要free) (2) PubMed (free)-Clinical Queries之 systematic review (3) Medline之systematic review
原始研究證據 (未經整理的文獻)	5.Studies - for證據評讀	(1) The Cochrane Library- Clinical trials (2) PubMed (free)-Clinical Queries之Clinical study search (3) Medline (善用more limit之功能)

搜尋流程 (自二次研究證據找起)

搜尋策略

■ 關鍵字的設定(利用PICO結構設定搜尋策略)

主要詞	同義詞1	同義詞2
P (	OR	OR) AND
I (	OR	OR) AND
C (	OR	OR) AND
O (	OR	OR) AND

■ 同義詞間以OR聯集，PICO間以AND交集 學習

■ 各種資料庫的搜尋方法 多練習，熟能生巧



檢索技巧

- ◆ 適當使用 MeSH Terms
- ◆ 運用 "Limit" 檢索功能
- ◆ 使用布林邏輯

MeSH Terms (Medical Subject Headings)

- 醫學主題表

是 NLM 針對生物醫學資料所整理出的主題詞彙。**對同一概念採用固定的詞彙表達方式**，以達到控制詞彙目的，方便生物醫學領域的學者或從業人員彼此間的溝通，更可用以陳述資料內容的主題意涵並提供檢索。



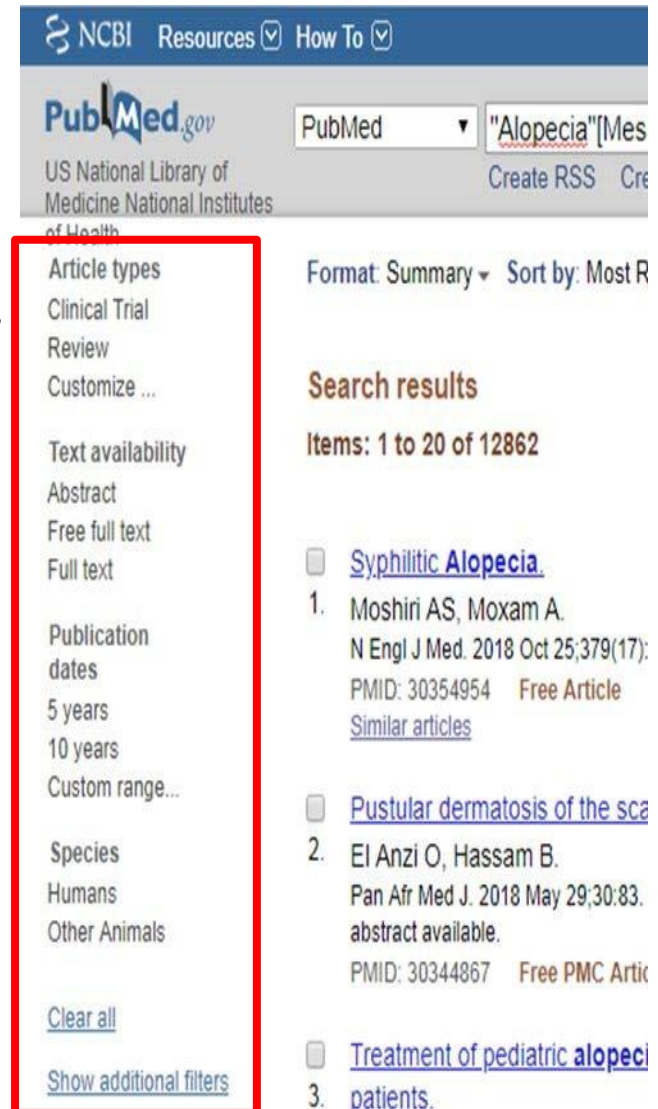
使用MeSH Terms優點

- 詞彙一致：如”癌症”，可用cancer、tumors、oncology，但在MeSH中，癌症主題詞是”neoplasms”，所有和「癌症」有關文章都會被標註”neoplasms”，只要以”neoplasms”就可撈出所有”癌症”文章，無論文章內用詞彙是cancer、tumors或oncology。



運用”Limit”檢索功能

可限定 文
章語言、
人類或動物主題、
出版類型(RCT)、
發表年份、
全文、
年齡...



The screenshot displays the PubMed interface. At the top, there are links for "NCBI", "Resources", and "How To". The main header includes the "PubMed.gov" logo and the text "US National Library of Medicine National Institutes of Health". A search bar contains the query "Alopecia" and a dropdown menu is set to "PubMed". To the right of the search bar are links for "Create RSS" and "Create alert". Below the header, a red box highlights the "Limits" section, which includes filters for "Article types" (Clinical Trial, Review, Customize...), "Text availability" (Abstract, Free full text, Full text), "Publication dates" (5 years, 10 years, Custom range...), and "Species" (Humans, Other Animals). There are also links for "Clear all" and "Show additional filters". To the right of the filters, the "Format" is set to "Summary" and "Sort by" is set to "Most Recent". The "Search results" section shows "Items: 1 to 20 of 12862". Three results are listed: 1. "Syphilitic Alopecia" by Moshiri AS, Moxam A, N Engl J Med. 2018 Oct 25;379(17): PMID: 30354954, Free Article, Similar articles; 2. "Pustular dermatosis of the scalp" by El Anzi O, Hassam B, Pan Afr Med J. 2018 May 29;30:83, abstract available, PMID: 30344867, Free PMC Article; 3. "Treatment of pediatric alopecia areata in patients".



使用布林邏輯

- 包括交集(AND)、聯集(OR)、刪除(NOT)三個運算元
- 用以擴大或縮小查詢範圍
- 可單獨或搭配使用
 - (Infant OR children) AND (allergy OR hypersensitivity)



多個字詞彙

- avian influenza ，找到的文獻兩個字拆開
- 用quotation 包覆，即”avian influenza”，精確比對到兩字緊鄰出現、順序一致文獻
- 適用包含多字，專有名詞、不宜被拆開的關鍵詞組

考科藍實證醫學資料庫



- 由Cochrane Collaboration成立
- 13個研究中心(亞洲分支:新加坡、泰國、中國、香港)
- 53個醫療系統評論小組(Collaborative Review Groups, CRGs)
- 15000位醫療專業人士(科學家等)投入Systematic Review
- SR研究成果收錄於Cochrane Database of Systematic Reviews (CDSR)
- 2-3年會重新進行資料收集及評讀





Advanced Search

Search

Search manager

Medical terms (MeSH)

Save search

View searches

Search help

Did you know you can now select fields from Search manager using the **S** button (next to the search box)?

Search manager lets you add unlimited search lines, view results per line and access the MeSH browser using the new **MeSH** button.

—	Title Abstract Keyword ▼	Infant OR Child OR Preschool	P1 OR P2 OR P3
—	AND ▼	Title Abstract Keyword ▼	I1
—	AND ▼	Title Abstract Keyword ▼	O1 OR O2
		Allergy OR Hypersensitivity	

(Word variations have been searched)

+

檢索列若空白需刪除

✕ Clear all

Search limits

Send to search manager

Run search

Filter your results

Date

Publication date

The last 3 months 0

The last 6 months 1

The last 9 months 1

The last year 1

The last 2 years 1

Custom Range:

dd/mm/yyyy

to

dd/mm/yyyy

Apply

Clear

Status

New search 1

Language

Hrvatski 2

Cochrane Reviews

2

Cochrane Protocols

0

Trials

273

Editorials

0

More



2 Cochrane Reviews matching **Infant OR Child OR Preschool in Title Abstract Keyword AND Probiotics in Title Abstract Keyword AND Allergy OR Hypersensitivity in Title Abstract Keyword** - (Word variations have been searched)

Cochrane Database of Systematic Reviews

Issue 3 of 12, May 2019

☐ Select all (2)

Export selected citation(s)

Show all previews

Order by Relevancy ▼

Results per page 25 ▼

1 ☐

Probiotics for treating eczema

Areti Makrgeorgou, Jo Leonardi-Bee, Fiona J Bath-Hextall, Dedee F Murrell, Mimi LK Tang, Amanda Roberts, Robert J Boyle

Show Preview ▼

Intervention

Review

21 November 2018

New search

2 ☐

Probiotics in infants for prevention of allergic disease and food hypersensitivity

David A Osborn, John KH Sinn

Show Preview ▼

Intervention

Rev

為例

Probiotics in infants for prevention of allergic disease and food hypersensitivity

Cochrane Systematic Review - Intervention | Version published: 17 October 2007 [see what's new](#)



[View article information](#)

David A Osborn | [✉ John KH Sinn](#)

[View authors' declarations of interest](#)

Abstract

Background

The composition of the intestinal microflora may be different in individuals with atopic eczema from those without this condition, and such differences may precede the development of eczema. Probiotics are live bacteria that colonize the gastrointestinal tract and provide a health benefit to the host. Probiotics added to infant feeds have the potential to prevent sensitisation of infants to dietary allergens.

[View PDF](#) ▼

[Cite this Review](#)

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Abstract

[Plain language summary](#)

[Authors' conclusions](#)

[Background](#)

[Objectives](#)

[Methods](#)

[Results](#)

[Discussion](#)

[Information](#)

[Authors](#)

[History](#)

輸入查詢關鍵字
會自動校正錯誤拼字

其他查詢功能

LEG CRAMP

All Topics



Contents

Patient Info

What's New

PCUs

Calculators

Drug Interactions

Search Results for "LEG CRAMP"

Collapse Results

Hide Topic Outline

All Topics

Adult

Pediatric

Patient

Graphics

Nocturnal leg cramps

- Nocturnal leg cramps
- Summary and recommendations
- Posterior leg stretch wall (Pictures)

Muscle cramps in dialysis patients

- Treatment
- Summary and recommendations
- Clinical features
- Pathophysiology

Approach to the patient with myalgia

- Diagnosis
- Summary and recommendations
- Diff dx diffuse myalgia (Tables)
- Diff dx localized myalgia (Tables)

Cirrhosis in adults: Overview of complications, general management, and prognosis

Topic Outline Show Graphics (1)

SUMMARY AND RECOMMENDATIONS

INTRODUCTION

NOCTURNAL LEG CRAMPS

- Etiology
- Diagnosis
- Differential diagnosis
- Management
 - Nonpharmacologic therapy
 - Pharmacotherapy
- Nocturnal leg cramps in children

OTHER NOCTURNAL LEG MOVEMENT CONDITIONS

- Sleep starts
- Nocturnal myoclonus

INFORMATION FOR PATIENTS

SUMMARY AND RECOMMENDATIONS

CRAMPS

搜尋相關主題瀏覽

主題和大綱預覽

LEG CRAMP

All Topics



Contents

Patient Info

What's New

PCUs

Calculators

Drug Interactions

Search Results for "LEG CRAMP"

Collapse Results

Hide Topic Outline

All Topics

Adult

Pediatric

Patient

Graphics

Nocturnal leg cramps

- ≡ Nocturnal leg cramps
- ≡ Summary and recommendations
- 🔍 Posterior leg stretch wall (Pictures)

Muscle cramps in dialysis patients

- ≡ Treatment
- ≡ Summary and recommendations
- ≡ Clinical features
- ≡ Pathophysiology

Approach to the patient with myalgia

- ≡ Diagnosis
- ≡ Summary and recommendations
- 🔍 Diff dx diffuse myalgia (Tables)
- 🔍 Diff dx localized myalgia (Tables)

Cirrhosis in adults: Overview of complications, general management, and prognosis**Topic Outline** Show Graphics (1)**SUMMARY AND RECOMMENDATIONS****INTRODUCTION****NOCTURNAL LEG CRAMPS**

- Etiology
- Diagnosis
- Differential diagnosis
- Management
 - Nonpharmacologic therapy
 - Pharmacotherapy
- Nocturnal leg cramps in children

OTHER NOCTURNAL LEG MOVEMENT CONDITIONS

- Sleep starts
- Nocturnal myoclonus

INFORMATION FOR PATIENT'S**SUMMARY AND RECOMMENDATIONS****GRAPHICS**

Find Patient Print Email

最後細讀整篇文章，可以有更深入的了解

Jeremy M Shefner, MD,
PhD

再看要查詢的細項

Winkelman, MD, PhD Grant/Research Support: GSK; Impax; UCB Pharma (no relevant products)]. Consultant/Advisory Boards: Impax; Sunovion; Zeev; Zeo Inc [Restless Leg Syndrome (no relevant products)]. **Ira N Targoff,**

All topics are updated as new evidence becomes available and our [peer review process](#) is complete.

Literature review current through: Jul 2014. | This topic last updated: Jul 07, 2014.

INTRODUCTION — Nocturnal leg cramps, a common lower extremity condition that produces pain and can disrupt sleep, are reviewed here. Other nighttime disorders of leg movement, including restless legs syndrome and periodic limb movements of sleep, are discussed separately. (See "[Clinical manifestations and diagnosis of restless legs syndrome in adults](#)" and "[Clinical manifestations and diagnosis of restless legs syndrome in adults](#)", section on 'Periodic limb movements of sleep'.)

CLINICAL KEY

Journals Books Practice Guidelines Patient Education Drugs Multimedia CME

Register

Login

CLINICAL KEY | ELSEVIER

leg cramp

Search

Saved Searches



Date

Relevance

Reading List



Presentation



Page

1

of 198



Displaying results 1 to 10 of 1978

Show

10



Items

Study Type

- ☒ All
- ☐ Systematic Reviews (18)
- ☐ Meta Analysis (6)
- ☐ Randomized Control Trials (47)
- ☐ Narrative Review (139)

Date

Specialty

Content Type

☒ Subscribed Content



[Nocturnal leg cramps](#) [First Consult]

Renee Monderer, MD

Revised: 09 Nov 2012

Last Updated: 07 Nov 2012

Nocturnal leg cramps represent a common disorder that often causes significant sleep disturbances, most notably among elderly patients. The cardinal features of leg cramps are sudden and intense muscle contractions of the limbs lasting several min...



[Sleep Disturbances and Sleep-Related Disorders in Pregnancy](#) [Book]

Principles and Practice of Sleep Medicine - Fifth Edition, Chapter 138, 1572-1586, © 2011

Pregnancy-related changes that can affect sleep. Management and treatment of sleep-related disorders. an apnea-hypopnea index, apnea-hypopnea index; BiPAP, bilevel positive airway pressure; continuous positive airway pressure, continuous positive ...



[Appendix V](#) [Book]

Ferris Clinical Advisor 2015, e1-e2110, © 2015

Managing Your: Abdominal Aortic Aneurysm What Is an Abdominal Aortic Aneurysm? An abdominal aortic aneurysm is a bulging of the aorta, the main blood vessel that takes blood from the heart to organs and tissues in the lower half of the body. The a...

Outline

No results found

PubMed ▾ Search

Advanced

Help



PubMed

PubMed comprises more than 23 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher web sites.



PubMed Commons

PubMed's new commenting system

More

Using PubMed

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- [New and Noteworthy](#) 

PubMed Tools

- [PubMed Mobile](#)
- [Single Citation Matcher](#)
- [Batch Citation Matcher](#)
- [Clinical Queries](#)
- [Topic-Specific Queries](#)

不含動物和細胞等
基礎研究

More Resources

- [MeSH Database](#)
- [Journals in NCBI Databases](#)
- [Clinical Trials](#)
- [E-Utilities \(API\)](#)
- [LinkOut](#)

1

PubMed Clinical Queries

拼字錯誤不會自動校正

Results of searches on this page are limited to specific clinical research areas. For comprehensive searches, use [PubMed](#) directly.

MAGNESIUM AND (MUSCLE cramp or leg cramp or leg spasm)

Search

Clinical Study Categories

Category:

Scope:

Results: 5 of 45

[\[Differential diagnosis and treatment of cramps\].](#)

Diener HC, Westphal K.
MMW Fortschr Med. 2013 Oct 10; 155 Suppl 3:83-6.

[Phase III randomized, placebo-controlled, double-blind study of intravenous calcium and magnesium to prevent oxaliplatin-induced sensory neurotoxicity \(N08CB/Alliance\).](#)

Loprinzi CL, Qin R, Dakhil SR, Fehrenbacher L, Flynn KA, Atherton P, Seisler D, Qamar R, Lewis GC, Grothey A.
J Clin Oncol. 2014 Apr 1; 32(10):997-1005. Epub 2013 Dec 2.

[Magnesium for muscle cramps.](#)

Scahill SL.
J Prim Health Care. 2013 Sep 1; 5(3):253. Epub 2013 Sep 1.

[On call. I have been experiencing strong muscle cramps that curl my fingers into a claw shape, which I can straighten only](#)

Systematic Reviews

Results: 3 of 3

[Magnesium for skeletal muscle cramps.](#)

Garrison SR, Allan GM, Sekhon RK, Musini VM, Khan KM.
Cochrane Database Syst Rev. 2012 Sep 12; 9:CD009402. Epub 2012 Sep 12.

[Cochrane made simple. Interventions for leg cramps in pregnancy.](#)

Anderson T.
Pract Midwife. 2007 Oct; 10(9):40.

[Interventions for leg cramps in pregnancy.](#)

Young GL, Jewell D.
Cochrane Database Syst Rev. 2002; (1):CD000121.

[See all \(3\)](#)

Medical Genetics

Topic:

Results: 4 of 4

[Gitelman's syndrome in late adulthood.](#)

Horak P, Jeck N, Frysak Z, Zadrazil J.
Clin Endocrinol (Oxf). 2005 Dec; 63(6):697-9.

[\[Gitelman syndrome in a 11 year old boy: incidental or delayed diagnosis?\].](#)

Gamboni A, Perino A, Montrasio G.
Pediatr Med Chir. 2003 Jan-Feb; 25(1):58-9.

[\[Gitelman's syndrome: an important differential diagnosis of hypokalemia\].](#)

Kurschat C, Heering P, Grabensee B.
Dtsch Med Wochenschr. 2003 May 30; 128(22):1225-8.

[Bartter's syndrome in pregnancy: a case report and review.](#)

O'Sullivan E, Monga M, Graves W.
Am J Perinatol. 1997 Jan; 14(1):55-7.

PubMed ▾ systematic[sb] AND (magnesium and (leg cramp or leg spasm or muscle cramp)) x Search

RSS Save search Advanced

[Show additional filters](#)

Display Settings: ▾ Summary, Sorted by Recently Added

Send to: ▾

[Clear all](#)

Article types

Review

More ... 內建filter

Text availability

Abstract

Full text

Publication dates

5 years

10 years

Custom range...

Species

clear

✓ Humans

Languages

clear

✓ English

More ...

[Clear all](#)

Results: 3

1 Filters activated: Humans, English. [Clear all](#) to show 3 items.

☐ [Magnesium for skeletal muscle cramps.](#)

1. Garrison SR, Allan GM, Sekhon RK, Musini VM, Khan KM.
Cochrane Database Syst Rev. 2012 Sep 12;9:CD009402. doi: 10.1002/14651858.CD009402.pub2. Review.
PMID: 22972143 [PubMed - indexed for MEDLINE]
[Related citations](#)

☐ [Cochrane made simple. Interventions for leg cramps in pregnancy.](#)

2. Anderson T.
Pract Midwife. 2007 Oct;10(9):40. Review. No abstract available.
PMID: 17990694 [PubMed - indexed for MEDLINE]
[Related citations](#)

☐ [Interventions for leg cramps in pregnancy.](#)

3. Young GL, Jewell D.
Cochrane Database Syst Rev. 2002;(1):CD000121. Review.
PMID: 11869565 [PubMed - indexed for MEDLINE]
[Related citations](#)

Filter your results:

All (3) 個人化filter

[English & Humans \(3\)](#)

[Review \(3\)](#)

taiwan (0)

cohort study (0)

case control study (0)

[Meta analysis \(1\)](#)

[systematic review \(3\)](#)

[randomized control trial \(1\)](#)

case report (0)

asian literature (0)

[Manage Filters](#)

New feature

Try the new Display Settings option -
Sort by Relevance

善用FILTER更快找出文獻 (SR)



US National Library of Medicine
National Institutes of Health

PubMed 

/"[Mesh])) OR ("Spasm/drug therapy"[Mesh] OR "Spasm/therapy"[Mesh]) and magnesium |  

 RSS [Save search](#) [Advanced](#)

[Show additional filters](#)

[Clear all](#)

Article types 

☒ Meta-Analysis

☒ Review

More ...

Text availability

Abstract

Full text

Publication dates

5 years

10 years

Custom range...

Species 

☒ Humans

Languages 

☒ English

More ...

[Clear all](#)

[Show additional filters](#)

Display Settings:  Summary, 20 per page, Sorted by Recently Added**Send to:** **Filter your results:**

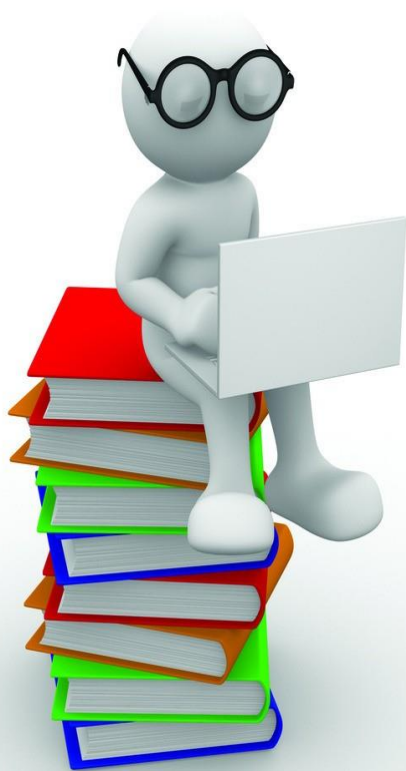
All (8)

[English & Humans](#)[Review \(8\)](#)[taiwan \(0\)](#)[cohort study \(0\)](#)[case control study](#)[Meta analysis \(2\)](#)[systematic review](#)[randomized contr](#)[case report \(2\)](#)[asian literature \(0\)](#)**Results: 8** Filters activated: Meta-Analysis, Review, Humans, English. [Clear all](#) to show 53 items.☐ [A meta-analysis of magnesium for tetanus.](#)1. Rodrigo C, Samarakoon L, Fernando SD, Rajapakse S.
Anaesthesia. 2012 Dec;67(12):1370-4. doi: 10.1111/anae.12020. Epub 2012 Oct 3. **Review.**
PMID: 23033859 [PubMed - indexed for MEDLINE]
[Related citations](#)☐ [Magnesium for skeletal muscle cramps.](#)2. Garrison SR, Allan GM, Sekhon RK, Musini VM, Khan KM.
Cochrane Database Syst Rev. 2012 Sep 12;9:CD009402. doi: 10.1002/14651858.CD009402.pub2. **Review.**
PMID: 22972143 [PubMed - indexed for MEDLINE]
[Related citations](#)☐ [Cochrane made simple. Interventions for leg cramps in pregnancy.](#)3. Anderson T.
Pract Midwife. 2007 Oct;10(9):40. **Review.** No abstract available.
PMID: 17990694 [PubMed - indexed for MEDLINE]
[Related citations](#)☐ [Tetanus in a subcutaneous drug abuser: ineffectiveness of intrathecal baclofen.](#)**New feature**

Try the new Display S

Sort by Relevance

步驟3:嚴格評讀(APPRAISAL: VIP)



文獻評讀常犯的錯誤

- 隨便找一篇文章
- 第一個字讀到最後一個字
- 花很多時間，但找到品質不是很好的文章
- 先看結果，再看討論
- 對於研究背景和方法卻不詳讀
- 看完文章對照顧病人並沒有幫助

如何進行文獻評讀

利用已評讀過
的文獻資料庫

- Cochrane Library
- ACP journal club

自行評讀文獻

- VIP(RAMbo)

利用評讀工具

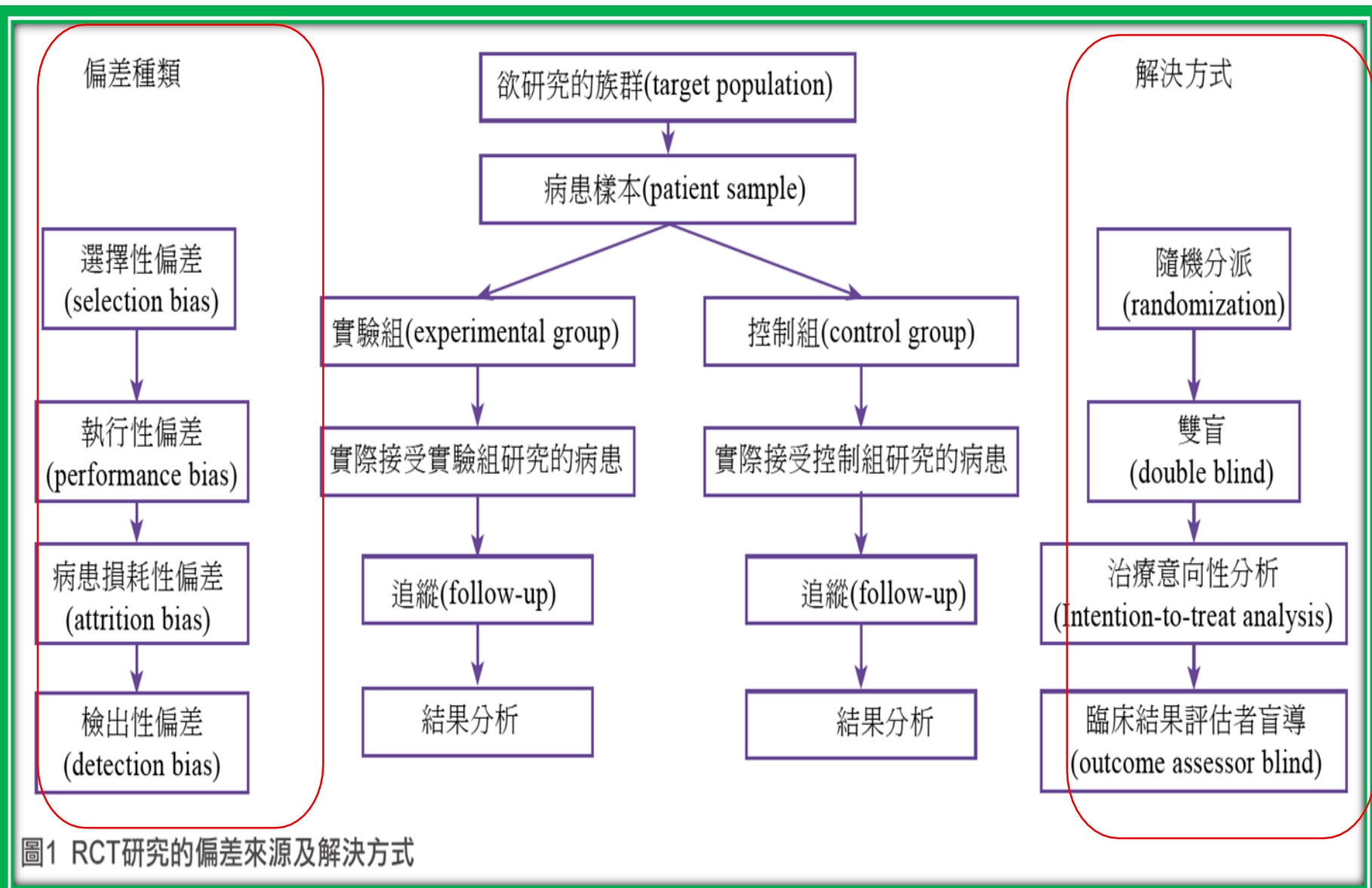
- CEBM-Oxford (CATmaker)
- CASP
- Cochrane RoB



不同問題類型的最佳研究設計

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

以研究流程圖說明主要偏差



嚴格評讀(APPRaisal: VIP)

Validity (Reliability) 效度/信度

Can we believe it ?

(研究方法的探討)

Importance (Impact) 重要性

Does it matter?

(研究結果的分析)

Practice (Applicability) 臨床適用性

Does it apply to our patients?

(如何在臨床運用)

Validity (Reliability)效度/信度

“Can we believe it ?”

What is the **RAMbo**?

- **R**epresentative 族群代表性
 - Random selection/ consecutive/ inception cohort
 - If comparative, were groups comparable?
(Random allocation/ adjustment)
- **A**scertainment/follow-up 足夠的確認/追蹤
 - Intention-to-treat (ITT) analysis
 - response rate/follow-up/verification>80%
- **M**easurement 結果量測適當性
 - **b**linded or **o**bjective measures

Importance (Impact)重要性

“ Dose it matter? ”

- **What were the results?**
 - How large was the treatment effect?
 - How precise was the estimate of the treatment effect?
 - What was the relative risk reduction?
 - What was the absolute risk reduction?
 - What were the confidence intervals?

Practice (applicability)臨床適用性

Does it apply to our patient?

- Were the study patients similar to my population of interest?
- Were all clinically important outcomes considered?
- Are the likely treatment benefits worth the potential harm and costs?

Levels of Evidence

Level of Evidence	Therapy/Prevention, Aetiology/Harm	Prognosis
1a	SR (with homogeneity*) of RCT	SR (with homogeneity*) of inception studies, or a CPG validated on a test set
1b	Individual RCT (with narrow Confidence Interval)	Individual inception cohort study with $\geq 80\%$ follow-up
1c	All or none	All or none case-series
2a	SR (with homogeneity*) of cohort study	SR (with homogeneity*) of either retrospective cohort studies or untreated control groups in RCTs
2b	Individual cohort study (include low quality RCT; e.g., $< 80\%$ follow-up)	Retrospective cohort study or follow-up untreated control patients in an RCT; or CPG not validated in a test set.
2c	"Outcomes" Research	"Outcomes" Research
3a	SR (with homogeneity*) of case-control studies	
3b	Individual Case-Control Study	
4	Case-series (and poor quality cohort and case-control studies)	Case-series (and poor quality prognostic cohort studies)
5	Expert opinion without explicit critical appraisal, or based on physiology bench research or "first principles"	Expert opinion without explicit critical appraisal, or based on physiology bench research or "first principles"

Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence

Question	Step 1 (Level 1*)	Step 2 (Level 2*)	Step 3 (Level 3*)	Step 4 (Level 4*)	Step 5 (Level 5)
How common is the problem?	Local and current random sample surveys (or censuses)	Systematic review of surveys that allow matching to local circumstances**	Local non-random sample**	Case-series**	n/a
Is this diagnostic or monitoring test accurate? (Diagnosis)	Systematic review of cross sectional studies with consistently applied reference standard and blinding	Individual cross sectional studies with consistently applied reference standard and blinding	Non-consecutive studies, or studies without consistently applied reference standards**	Case-control studies, or "poor or non-independent reference standard**	Mechanism-based reasoning
What will happen if we do not add a therapy? (Prognosis)	Systematic review of inception cohort studies	Inception cohort studies	Cohort study or control arm of randomized trial*	Case-series or case-control studies, or poor quality prognostic cohort study**	n/a
Does this intervention help? (Treatment Benefits)	Systematic review of randomized trials or n-of-1 trials	Randomized trial or observational study with dramatic effect	Non-randomized controlled cohort/follow-up study**	Case-series, case-control studies, or historically controlled studies**	Mechanism-based reasoning
What are the COMMON harms? (Treatment Harms)	Systematic review of randomized trials, systematic review of nested case-control studies, n-of-1 trial with the patient you are raising the question about, or observational study with dramatic effect	Individual randomized trial or (exceptionally) observational study with dramatic effect	Non-randomized controlled cohort/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out a common harm. (For long-term harms the duration of follow-up must be sufficient.)*	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning
What are the RARE harms? (Treatment Harms)	Systematic review of randomized trials or n-of-1 trial	Randomized trial or (exceptionally) observational study with dramatic effect			
Is this (early detection) test worthwhile? (Screening)	Systematic review of randomized trials	Randomized trial	Non-randomized controlled cohort/follow-up study**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning

* Level may be graded down on the basis of study quality, imprecision, indirectness (study PICO does not match questions PICO), because of inconsistency between studies, or because the absolute effect size is very small; Level may be graded up if there is a large or very large effect size.

** As always, a systematic review is generally better than an individual study.

How to cite the Levels of Evidence Table

OCEBM Levels of Evidence Working Group*. "The Oxford 2011 Levels of Evidence".

Oxford Centre for Evidence-Based Medicine. <http://www.cebm.net/index.aspx?o=5653>

* OCEBM Table of Evidence Working Group = Jeremy Howick, Iain Chalmers (James Lind Library), Paul Glasziou, Trish Greenhalgh, Carl Heneghan, Alessandro Liberati, Ivan Moschetti, Bob Phillips, Hazel Thornton, Olive Goddard and Mary Hodgkinson

牛津實證醫學中心證據等級表 2011 (翻譯 by EGRD Office)

臨床問題	證據等級 1*	證據等級 2*	證據等級 3*	證據等級 4*	證據等級 5*
此臨床問題多常見?	區域及當代隨機樣本的 (人口) 普查	切合當地環境普查的系統性回顧**	區域性非隨機樣本調查**	系列病例報告**	n/a
診斷或監測工具正確嗎? (診斷)	使用一致的參考 (黃金) 標準及盲化的斷代研究的系統性回顧	使用一致的參考 (黃金) 標準及盲化的斷代研究	非連續性研究或沒有使用一致的參考 (黃金) 標準的研究**	病例對照試驗、低品質或無獨立參考標準的研究**	基於基本原理的推斷
如果不治療會有什麼後果? (預後)	初期 (inception) 世代研究的系統性回顧	初期 (inception) 世代研究	世代研究或隨機對照研究的控制組**	系列病例報告、病例對照試驗或低品質的預後型世代研究**	n/a
這個介入治療有幫助嗎? (治療益處)	隨機對照試驗 (RCT) 或隨機序列治療試驗 (n-of-1) ^(a) 的系統性回顧	隨機對照試驗或有顯著療效的觀察型研究	非隨機控制的世代/追蹤研究**	系列病例報告、病例對照試驗或歷史對照試驗**	基於基本原理的推斷
介入治療的常見害處? (治療傷害)	隨機對照試驗 (RCT)、巢式病例對照試驗、隨機序列治療試驗 (n-of-1) ^(a) 或有顯著療效的觀察型研究的系統性回顧	隨機對照試驗或有顯著傷害 ^(b) 的異常觀察型研究	非隨機控制的世代/追蹤研究 (上市後監測) 提供足夠的樣本數去排除常見之危害 (關於長期危害, 需有足夠的追蹤時間) **	系列病例報告、病例對照試驗或歷史對照試驗**	基於基本原理的推斷
介入治療的罕見害處? (治療傷害)	隨機對照試驗 (RCT) 或隨機序列治療試驗 (n-of-1) ^(a) 的系統性回顧	隨機對照試驗或有顯著傷害的異常觀察型研究			
值得早期診斷嗎? (篩檢)	隨機對照試驗 (RCT) 的系統性回顧	隨機對照試驗	非隨機控制的世代/追蹤研究**	系列病例報告、病例對照試驗或歷史對照試驗**	基於基本原理的推斷

*如果研究品質差、不精確 (95% 信賴區間大)、PICO 和我們的臨床情境不盡相符, 或是證據間沒有一致性、絕對效果 (absolute effect size) 小, 證據等級需酌情降級! 反之, 如果絕對效果顯著, 證據等級可考慮升級!

**系統性回顧文獻優於單一研究文獻。

(a) 不同的治療方式 (A or B) 依隨機方式依序施行於同一個病人身上, 一組為 A-B 序列治療組, 另一組為 B-A 序列治療組。

(b) 有顯著危害是指超過 20% 的受試者有此傷害反應。

證據力等級	治療, 病因, 預防	預後	診斷	鑑別診斷, 症狀盛行率研究	經濟分析, 決策分析
Level 1	RCT 的系統性回顧；或 Confidence Interval 窄的 RCT	世代研究的系統性回顧；或達到 80% 比例的世代研究；或經驗證的臨床指引	系統性回顧 Level 1 文獻；或以公認標準驗證的世代研究；或臨床指引	前瞻世代研究之系統性回顧；或追蹤完整之前瞻世代研究	系統性回顧 Level 1 證據；或比較好壞方向的研究
Level 2	世代研究的系統性回；或低品質的 RCT 或追蹤小於 80%；或預後研究%	回溯性世代研究；或追蹤 RCT 中未治療的對照組；或由小族群推測或驗證的臨床指引；或預後研究	系統性回顧 Level 2 文獻；或僅在小族群驗證的臨床指引	回溯世代研究之系統性回顧；或追蹤不全之回溯世代研究；或生態 (ecological) 研究	系統性回顧 Level 2 文獻；或重要臨床方法或成本的單一研究；或預後研究
Level 3	有對照組 (controlled study)		系統性回顧 Level 3 文獻；或不連續或缺乏公認標準驗證的研究	不連續或小族群的世代研究	其他臨床方法或成本的研究，包括敏感度 (sensitivity) 分析
Level 4	病例系列	病例系列	對照病例研究 (case-control study)	病例系列	未分析敏感度
Level 5	專家意見	專家意見	專家意見	專家意見	專家意見

研究結果估算-常見專有名詞

- Therapy/Prevention (治療/預防)
 - Relative risk reduction (RRR, 相對風險性降低度)
 - Absolute risk reduction (ARR, 絕對風險性降低度)
 - Number needed to treat (NNT, 益一需治數)
- Harm/Etiology (傷害/病因)
 - Relative risk (RR, 風險比)標準值 “1 ”
 - Risk difference (RD, 風險差) 標準值 “0 ”
 - Absolute risk increase (ARI, 絕對風險性增加度)
 - Number needed to harm (NNH, 害一需治數)
- Prognosis (預後)
 - Event rate (事件發生率)
 - Odds ratio (OR, 勝算比)
- Diagnosis (診斷)
 - Sensitivity (敏感度)
 - Specificity (特異度)
 - Positive predictive value (陽性預測值)
 - Negative predictive value (陰性預測值)
 - Likelihood ratio (相似比)



- **ARR (absolute risk reduction)**：絕對風險差（風險差異之絕對值）
實驗組和控制組產生不良結果的比率差異，其算法為：

$$\text{ARR} = |\text{EER} - \text{CER}|$$

以上案例而言，則 $\text{ARR} = |\text{EER} - \text{CER}| = |0.033 - 0.3| = 0.267$

- **Number needed to treat (NNT)**：需要被治療的數量
絕對風險的減少率的倒數： $1/\text{ARR}$
即預防產生一個不良結果（或為使一位病人達到實驗所求之有益結果）所需治療的數量。

例如：在信賴區間為95%下，非胰島素依賴型糖尿病人中發生糖尿病型維生素A缺乏症的ARR為25%，則其 $\text{NNT} = 1/25\% = 4$ 。



- **ARI (absolute risk increase)**：風險增加之絕對值
實驗組和控制組產生不良或有害結果的差異，
即： $|EER - CER|$ （和ARR公式相同）

例如：在95%信賴區間下，某種治療產生低血糖副作用的情形，其EER為57%，CER為23%，

$$ARI = |EER - CER| = |57\% - 23\%| = 34\%。$$

(ARI 也被使用於評估『危險因子』對於疾病的影響。)

- **NNH (number needed to harm)**：需要被傷害的數量
當病患接受了這個實驗性的治療後，就可能會有病人受到副作用的傷害，這個數字表示--對多少病患進行此實驗療法，與對照組做比較後，會有一個病人產生不良的結果。

算法： $1/ARI$

呈上例：在信賴區間95%下，ARI為34%，則其

$$NNH = 1/ARI = 1/34\% = 3$$



- **Control event rate (CER)**：對照組的發生（病）率
即在研究中未施與介入因子（即實驗的療法），產生研究所關心之結果的頻率。
- **Experimental event rate (EER)**：實驗組的發生（病）率
即在施與介入因子（實驗療法）後的病患，被觀察到發生研究所關心之結果的比率。
- **RRR (relative risk reduction)**：相對風險差
在實驗組及對照組間所產生的不良結果比率所之降低百分比。
算法： $RRR = |EER - CER| / CER$

舉例：設CI=95%，以維生素A療法治療嚴重的糖尿病患者，實驗組及對照組分別各有30人，實驗組發生感染的人數為1人，對照組發生感染者有9人——

$$EER = 1/30 = 0.033$$

$$CER = 9/30 = 0.3$$

$$RRR = |EER - CER| / CER = |0.033 - 0.3| / 0.3 = 0.267 / 0.3 = 0.89$$



		Outcome	
		Present	Absent
Exposure/Treatment	Present	a	b
	Absent	c	d

$$\text{Controlled Event Rate (CER)} = \frac{c}{c + d}$$

$$\text{Experimental Event Rate (EER)} = \frac{a}{a + b}$$

$$\text{Relative Risk (RR)} = \frac{a/(a + b)}{c/(c + d)}$$

$$\text{Relative Risk Reduction (RRR)} = 1 - RR$$

$$= \frac{c/(c + d) - a/(a + b)}{c/(c + d)}$$

$$\text{Absolute Risk Reduction (ARR)} = \frac{c}{c + d} - \frac{a}{a + b}$$

$$\text{Number Needed to Treat (NNT)} = \frac{1}{ARR}$$



Test characteristics 診斷工具的特性

- Sensitivity (敏感度):
有病者檢驗呈陽性的機率
- Specificity (特異性):
無病者檢驗呈陰性的機率
- Positive likelihood ratio (陽性相似比):
有病者/無病者 檢驗呈陽性的比率 $LR+ = \text{sens}/(1-\text{spec})$
- Negative likelihood ratio (陰性相似比):
有病者/無病者 檢驗呈陰性的比率 $LR- = (1-\text{sens})/\text{spec}$
- Positive predictive value (PPV) (陽性預測值):
測驗陽性者有病的機率 $PPV. = P * \text{Sen.} / \{P * \text{Sen.} + (1 - p)(1 - \text{Spe.})\}$
- Negative predictive value (NPV) (陰性預測值):
測驗陰性者無病的機率 $NPV. = (1 - P)\text{Spe.} / \{P(1-\text{Sen.}) + (1 - P)\text{Spe.}\}$

Pre-test odds x Likelihood ratios = **Post-test odds**



定量評價療效指標

- 相對效應評價

RR(relative risk)

OR(odds ratio)

RRR(relative risk reduction)

- 絕對效應評價

ARR(absolute risk reduction)

ARI(absolute risk increase)

- **95% confidence interval**
- **NNT; NNH**



文獻評讀工具介紹

評讀工具	SR/Meta analysis	RCT	Cohort study	Case control	Observation study	Diagnostic test	Prognosis
 CASP	✓	✓	✓	✓		✓	
 CEBM	✓	✓				✓	✓
 PRISMA	✓						
 STROBE			✓	✓	✓		
 CONSORT		✓					
Jadad Scale		✓					

CASP: Critical Appraisal Skills Programme

CEBM: Centre for Evidence Based Medicine

PRISMA: Preferred reporting items for systematic reviews and meta-alysis

STROBE: Strengthening the Reporting of Observational Studies in Epidemiology

CONSORT: Consolidated Standards of Reporting Trials

CASP (Critical Appraisal Skills Programme)



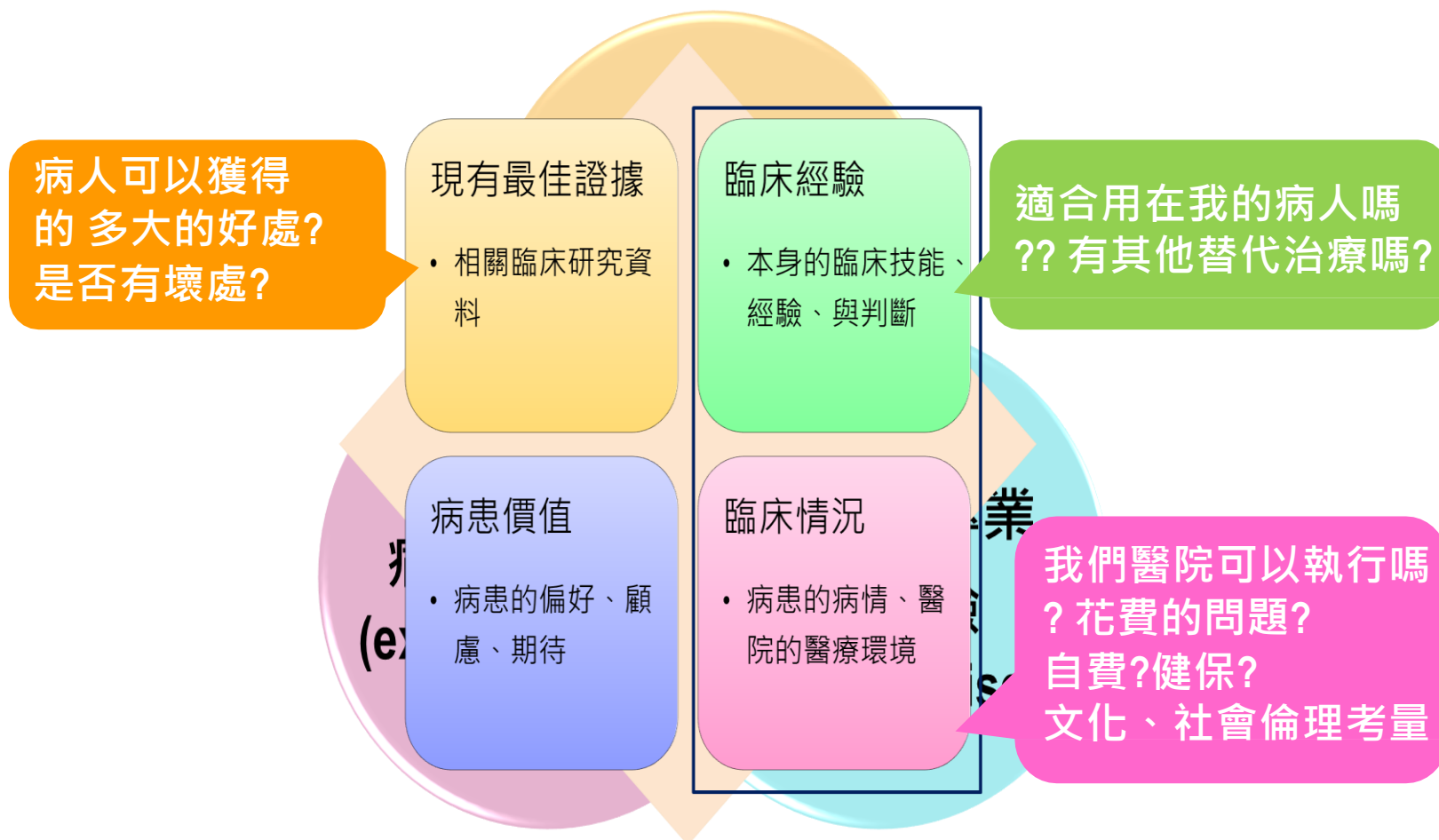
- 為英國 Better Value Healthcare機構所研發，各種研究類型皆有其對應的 critical appraisal tools
- SR、世代研究、病例對照研究、質性研究、RCT Checklist
- <http://www.casp-uk.net/checklists>
- 免費下載

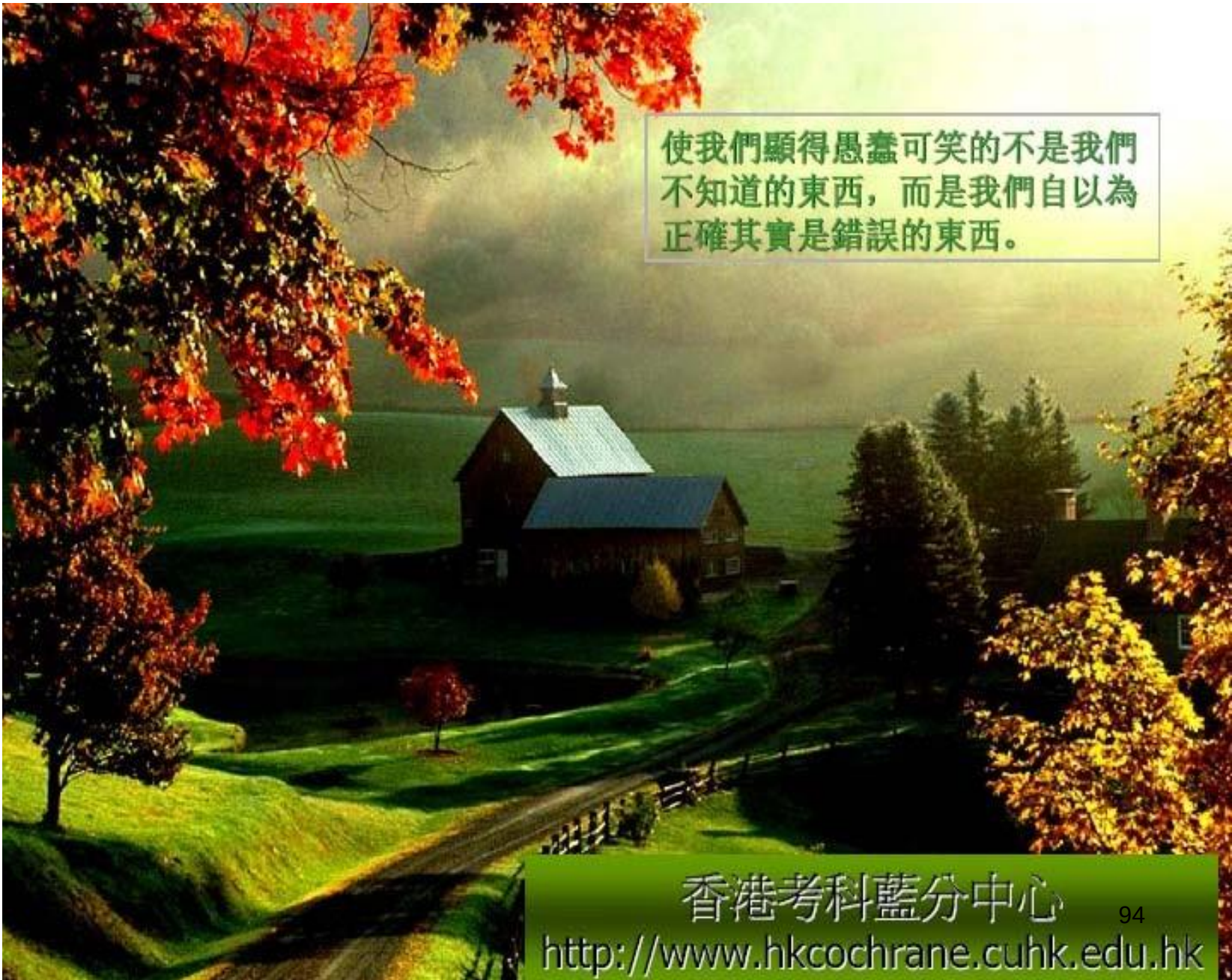
CEBM (Centre for Evidence-Based Medicine)

- 牛津大學實證醫學中心 2010 發展
- SR、RCT、Diagnostic Study、Prognosis Study Checklist
- 已有中文版(楊宗翰，邵時傑譯，2017)
- <http://www.cebm.net/critical-appraisal/>
- 免費下載

步驟4: 恰當應用(APPLY: 3E)

- 整合運用於臨床





使我們顯得愚蠢可笑的不是我們
不知道的東西，而是我們自以為
正確其實是錯誤的東西。

香港考科藍分中心

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<http://www.hkcochrane.cuhk.edu.hk>



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