高雄醫學大學附設中和紀念醫院
Kaohsiung Medical University Chung-Ho Memorial Hospital

第13屆醫療品質獎

實證醫學應用類　文獻查證進階組

組員：林采蓉護理師
楊禮嘉醫師
林奕萱醫師
報告者：楊禮嘉醫師
單位名稱：高雄醫學大學

2012年08月12日

本院推動實證醫學歷程介紹

- 自93學年度起引進實證醫學，應用於臨床照護及學生教育
- 定期舉辦實證月會，鼓勵各科室參與(16-20場/年)
- 工作坊、研習會、資料庫使用說明會
  - 宣導實證概念及運用
- 舉辦實證醫學相關研習會

97-100學年度舉辦訓練活動場次

學年度	舉辦活動	場次
97	EBM月會	19
	R EBM Workshop	2
	Intern EBM Workshop	3
	與國衛院合辦考科藍系統性文獻回顧工作坊 Critical Appraisal & Systematic Review Workshop	1
98	EBM月會	20
	Intern EBM Workshop	3
99	EBM月會	16
	Intern EBM Workshop	2
	主治醫師及其他醫事人員EBM Workshop	1
	全院實證醫學競賽	1
100	EBM月會	20
	Intern EBM Workshop	2
	全院實證醫學競賽	1
	與EBM學會合辦:進階實證檢索的Power Engine研討會	1

本院之院內EBM競賽

- 99年舉辦院內EBM競賽，各單位推派三人組成一隊參賽
- 101年比照醫策會醫療品質獎實證醫學應用類競賽模式，規劃以臨床科為單位，三人為一隊參賽，其中需包含一位跨專業領域成員
- 獎勵方式：第一名獎金10000元、第二名獎金 8000元、第三名獎金 6000元、優勝獎金3000元（取三隊）

	第一名	第二名	第三名	優勝
99年度	內科部(一)	家醫科	內科部(二)	耳鼻喉科 護理部 藥劑部
100年度	內科部(三)	藥劑部	護理部	家醫科 內科部(一) 皮膚科

本次競賽團隊成員

- 林采蓉護理師：燒傷加護病房護理師
- 楊禮嘉醫師：內科部第三年住院醫師
- 林奕萱醫師：精神科第三年住院醫師

臨床場景-1

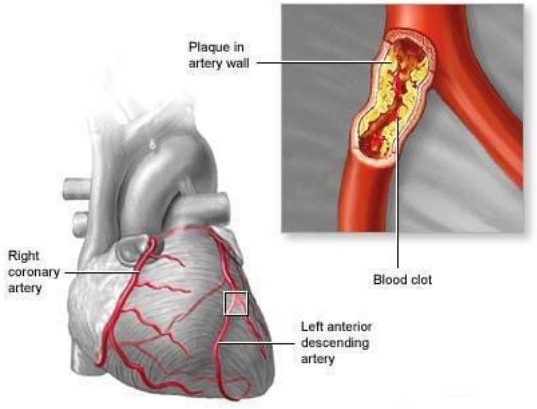
- 李先生，65歲，**長期菸癮**(30年以上抽菸史)，患有**高血壓及糖尿病**，十多年來在診所拿藥，血壓控制得不錯，最近常感到**胸口煩悶**，尤其是早晨或工作及運動後，因懷疑是心絞痛被診所醫師轉介至醫院做進一步檢查。
- 到醫院後，醫師表示要判斷是否有**冠狀動脈阻塞**，最準確的診斷方法為**心導管檢查**，但風險較高。建議可先做**非侵入性檢查：運動心電圖、心肌灌注掃描檢查或費用較昂貴的心臟64切電腦斷層掃描。**

臨床場景-2

- 到底哪種檢查對李先生是最好的判斷冠狀動脈疾病工具?若真的有問題是否非得做心導管手術不可?

背景資訊

- Definition: 3 presentations of angina that suggest an acute coronary syndrome (ACS)
- Rest angina, which is usually more than 20 minutes in duration
- New onset angina that markedly limits physical activity
- Increasing angina that is more frequent, longer in duration, or occurs with less exertion than previous angina



背景資訊-2

- Risk Factors (The JNC 7 report. JAMA 2003; 289:2560.)

Major risk factors
Hypertension
Cigarette smoking
Obesity (BMI ≥30 kg/m2)
Physical inactivity
Dyslipidemia
Diabetes mellitus
Microalbuminuria or estimated GFR <60 mL/min
Age >55 years for men, >65 years in women
Family history of premature coronary disease
Men - <55 years
Women - <65 years

Step 1 –Ask
提出可回答的臨床問題

- 臨床重要的問題
  - 什麼檢查是最好的判斷冠狀動脈疾病工具？
  - 若有問題，是否先做心導管手術不可？
- 病人關心的問題
  - 什麼檢查最能診斷出我的疾病？

Step 1 –Ask
提出可回答的臨床問題

❑把臨床場景轉換成可回答的臨床問題

	中文	英文
P	65歲男性，有抽菸史、高血壓及糖尿病病史，有心絞痛症狀	65y/o male with history of smoking, hypertension and diabetes mellitus. Recent symptoms: angina and chest tightness
I	心臟64切電腦斷層掃描	64-Slice computed tomography angiography
C	心導管檢查	Coronary angiography
O	最好的判斷冠狀動脈疾病工具?	Diagnostic accuracy of coronary artery disease

把問題寫成PICO – PICO 1

P：patient	• 65y/o male with history of smoking, hypertension and diabetes mellitus. Recent symptoms: angina and chest tightness, suspected CAD
I：intervention	• 64-Slice computed tomography angiography
C：comparison	• Coronary angiography
O：outcome	• Diagnostic accuracy of coronary artery disease

◆ 這是：治療型　傷害型　**診斷型**　預後型　問題

把問題寫成PICO – PICO 2

P：patient	• 65y/o male with history of smoking, hypertension and diabetes mellitus. Recent symptoms: angina and chest tightness, suspected CAD
I：intervention	• T-PA injection
C：comparison	• Coronary angiography
O：outcome	• Mortality rate

◆ 這是：治療型　傷害型　診斷型　預後型　問題

Step 2 – Acquire

以6S步驟取得實證資訊

UpToDate

DynaMed

ACP PIER

BMJ Clinical Evidence

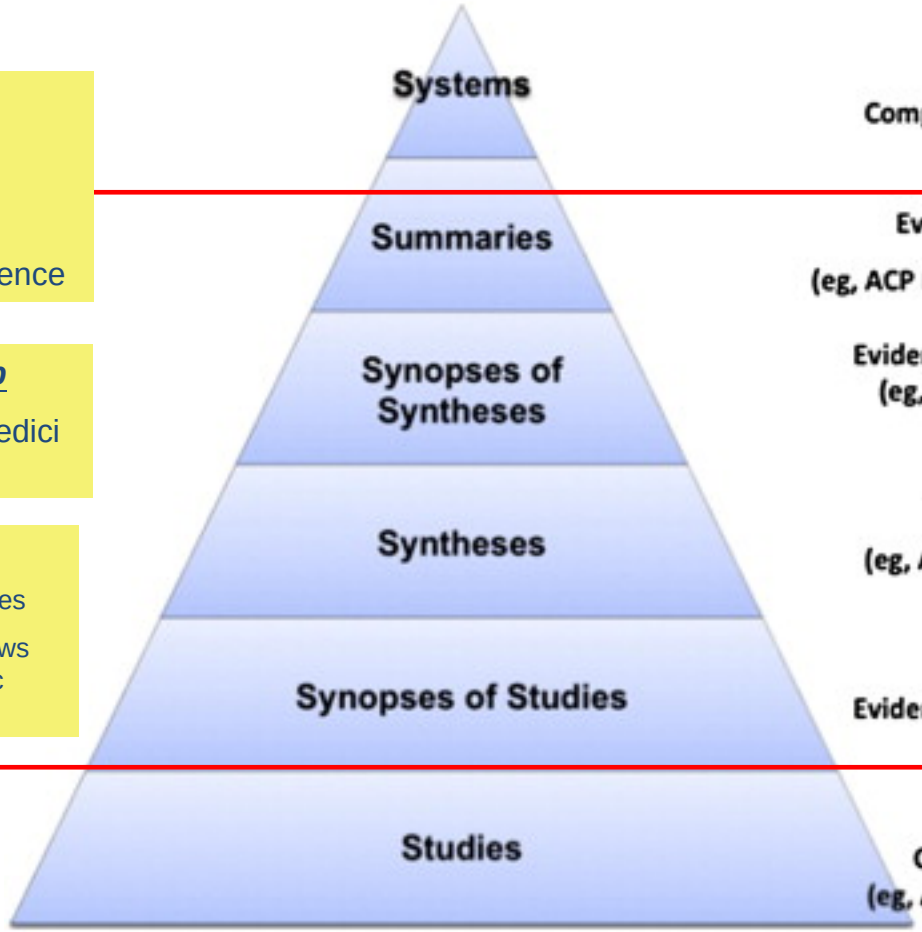
ACP journal club

Evidencebasedmedicine.com

Cochrane Library

BMJ Evidence Updates

Other Systemic reviews eg. PubMed systemic reivew



搜尋資料庫

- The Cochrane library
- ACP Journal Club
- PubMed
- Dynamed
- UpToDate
- 考科藍實證醫學資料庫、CEPS及全國碩博士論文

Search Strategy

- Using Mesh & Nature term
- Boolean Operators
- Limitations
- Language
- Articles type

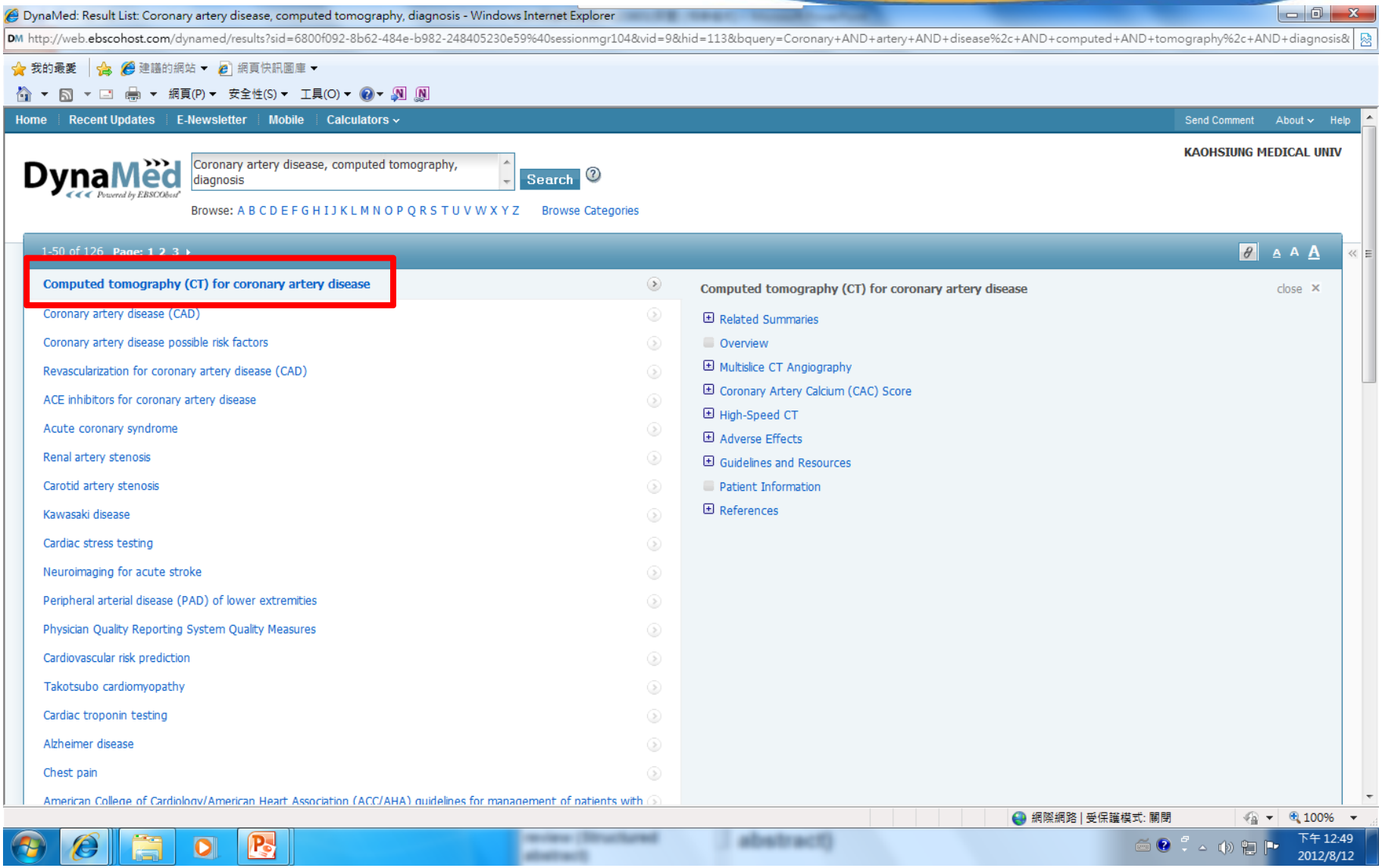
將PICO鍵入Key words

P	Natural words	Coronary artery disease
	Mesh term	--
I	Natural words	64-Slice computed tomography angiography
	Mesh term	--
C	Natural words	Coronary angiography
	Mesh term	--
O	Natural words	Diagnostic accuracy
	Mesh term	--

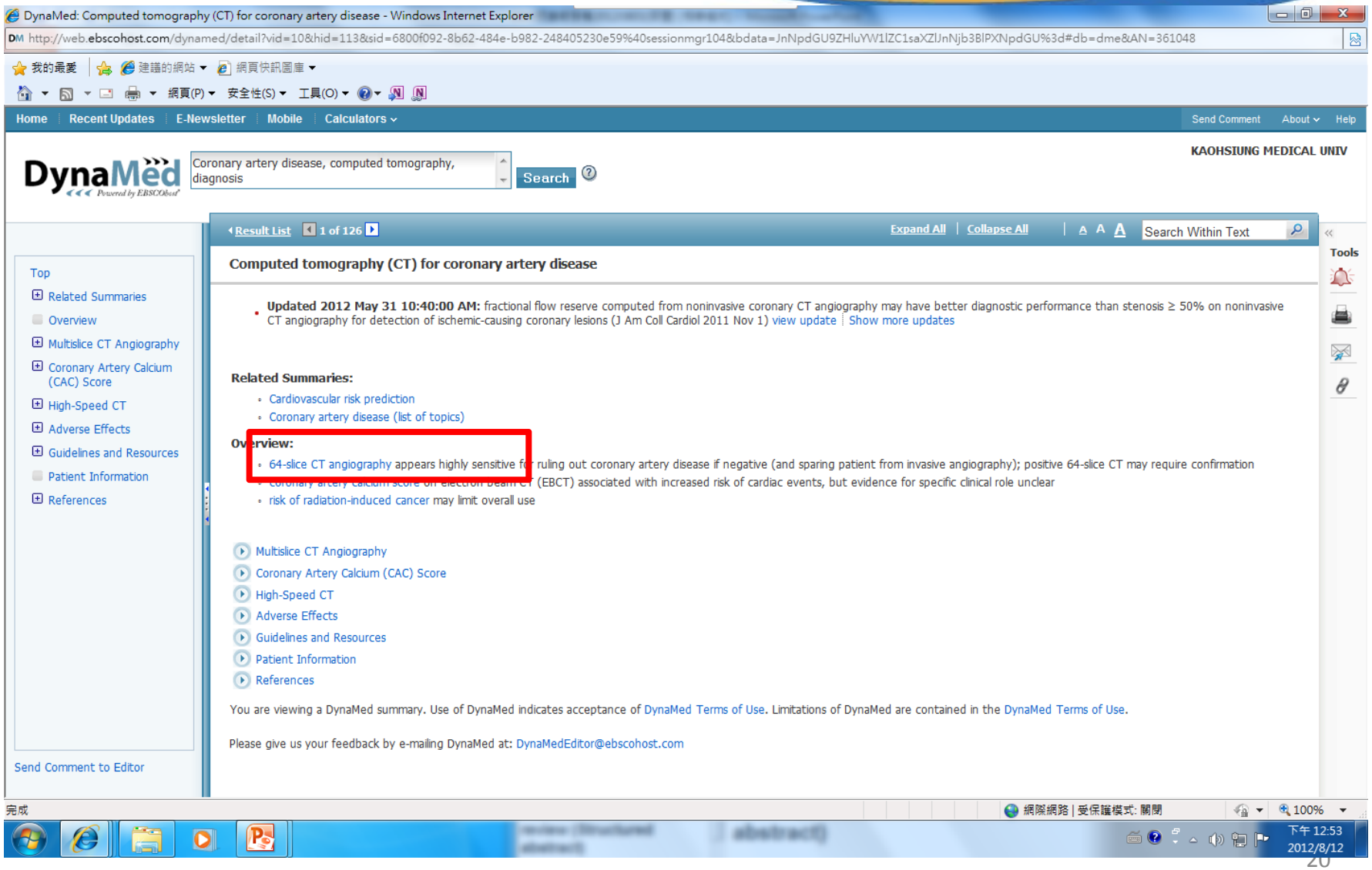
解答不同類型臨床問題之最佳研究設計

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

Results of searching: DynaMed



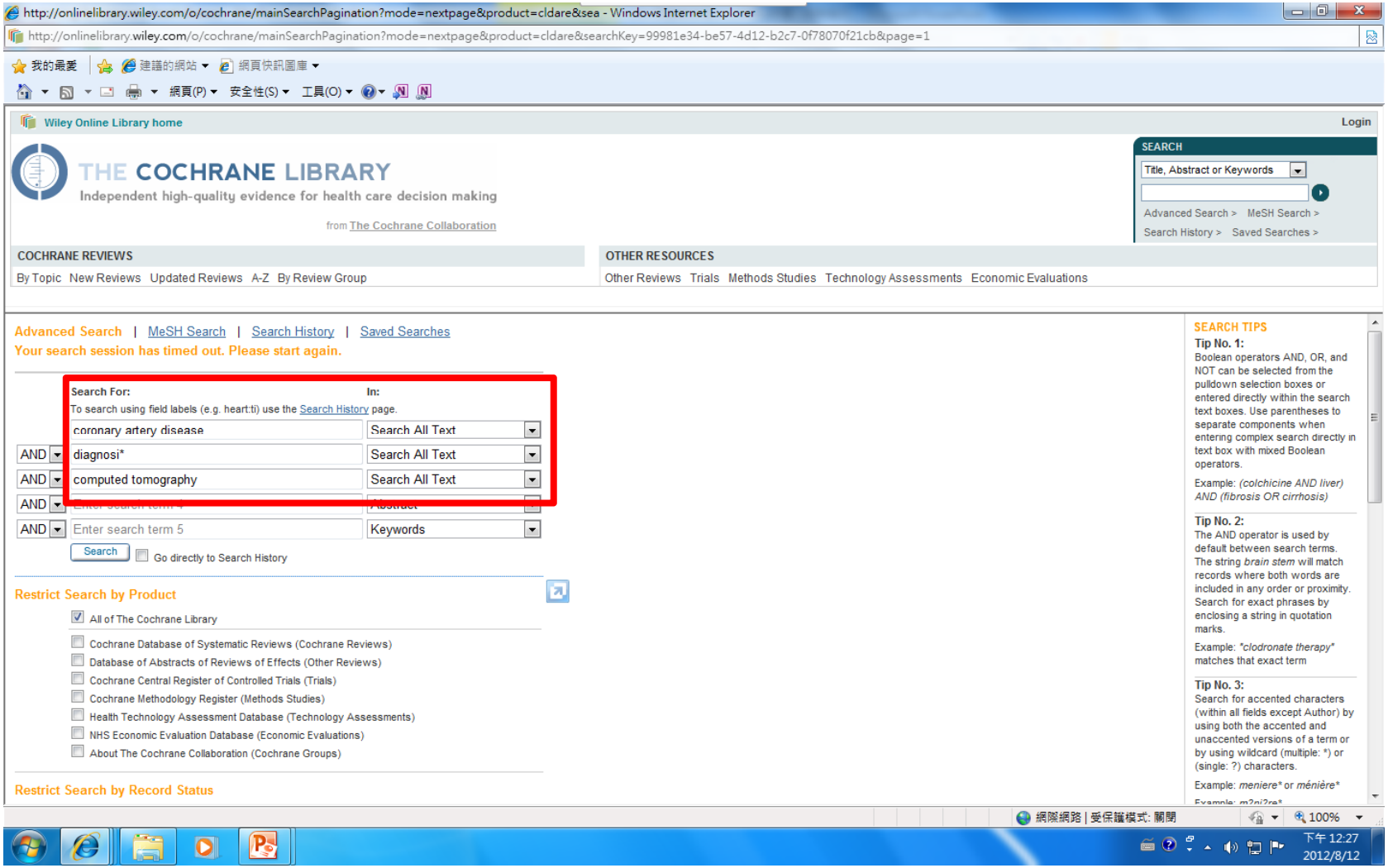
Results of searching: DynaMed



Results of searching:

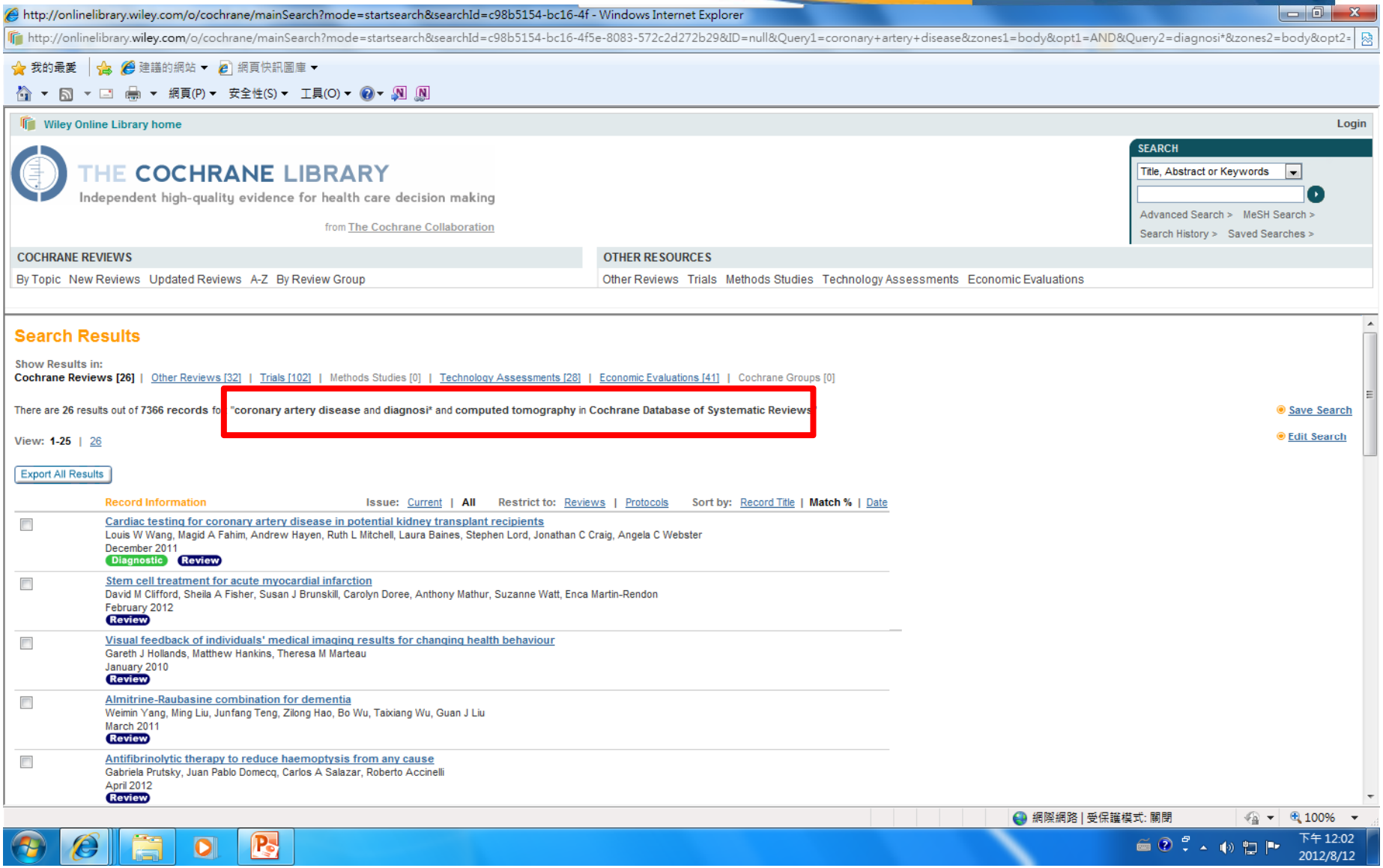
1. 64-slice CT angiography appears highly sensitive for ruling out coronary artery disease
2. 64-slice CT may rule out significant coronary artery disease if negative, but positive 64-slice CT requires confirmation and risk of radiation-induced cancer may limit overall use
3. multidetector CT appears accurate for diagnosis of coronary artery disease

Results of searching: The Cochrane Library



Results of searching:

The Cochrane Library



Searching results: PubMed

PubMed | 64 SLICE COMPUTED TOMOGRAPHY CORONARY ARTERY DISEASE DIAGNOSTIC ACCURACY | Search

RSS Save search Advanced Help

Display Settings: Summary, Sorted by Recently Added Send to:

See 4 articles found by title matching your search:

Impact of calcification on diagnostic accuracy of 64-slice spiral computed tomography for detecting coronary artery disease: a single center experience. Nazeri I et al. Arch Iran Med. (2010)

Diagnostic accuracy of 64-slice computed tomography in patients with suspected or proven coronary artery disease. Selçoki Y et al. Turk Kardiyol Dern Ars. (2010)

Gender influence on the diagnostic accuracy of 64-slice multislice computed tomography coronary angiography for detection of obstructive coronary artery disease. Pundziute G et al. Heart. (2008)

Results: 4

Filters activated: Full text available, published in the last 5 years, Humans, Meta-Analysis Clear all

1. A systematic review of the clinical effectiveness of **64-slice** or higher **computed tomography** angiography as an alternative to invasive **coronary** angiography in the investigation of suspected **coronary artery disease**.
   Paech DC, Weston AR.
   BMC Cardiovasc Disord. 2011 Jun 16;11:32. Review.
   PMID: 21679468 [PubMed - indexed for MEDLINE] Free PMC Article
   Related citations

2. **Diagnostic accuracy** of **64-slice computed tomography coronary** angiography for the detection of in-stent restenosis: a **meta-analysis**.
   Carrabba N, Schuijf JD, de Graaf FR, Parodi G, Maffei E, Valenti R, Palumbo A, Weustink AC, Mollet NR, Accetta G, Cademartiri F, Antoniucci D, Bax JJ.
   J Nucl Cardiol. 2010 Jun;17(3):470-8. Epub 2010 Apr 9.
   PMID: 20379863 [PubMed - indexed for MEDLINE] Free PMC Article
   Related citations

3. **Diagnostic accuracy** of **64** multislice CT angiography in the assessment of **coronary** in-stent restenosis: a **meta-analysis**

Filters: Manage Filters

16 free full-text articles in PubMed Central

Multislice **computed tomography** angiography in the diagnosis of **coron** [J Geriatr Cardiol. 2011]

Coronary computed tomography angiography in **coronary artery disea** [World J Cardiol. 2011]

Review A systematic review of the clinical effectiveness of **6** [BMC Cardiovasc Disord. 2011]

See all (16)...

Find related data

Database: Select

Find items

Search details

```
(64[All Fields] AND SLICE[All
Fields] AND ("tomography, x-ray
computed"[MeSH Terms] OR
("tomography"[All Fields]
AND "x-ray"[All Fields]
```

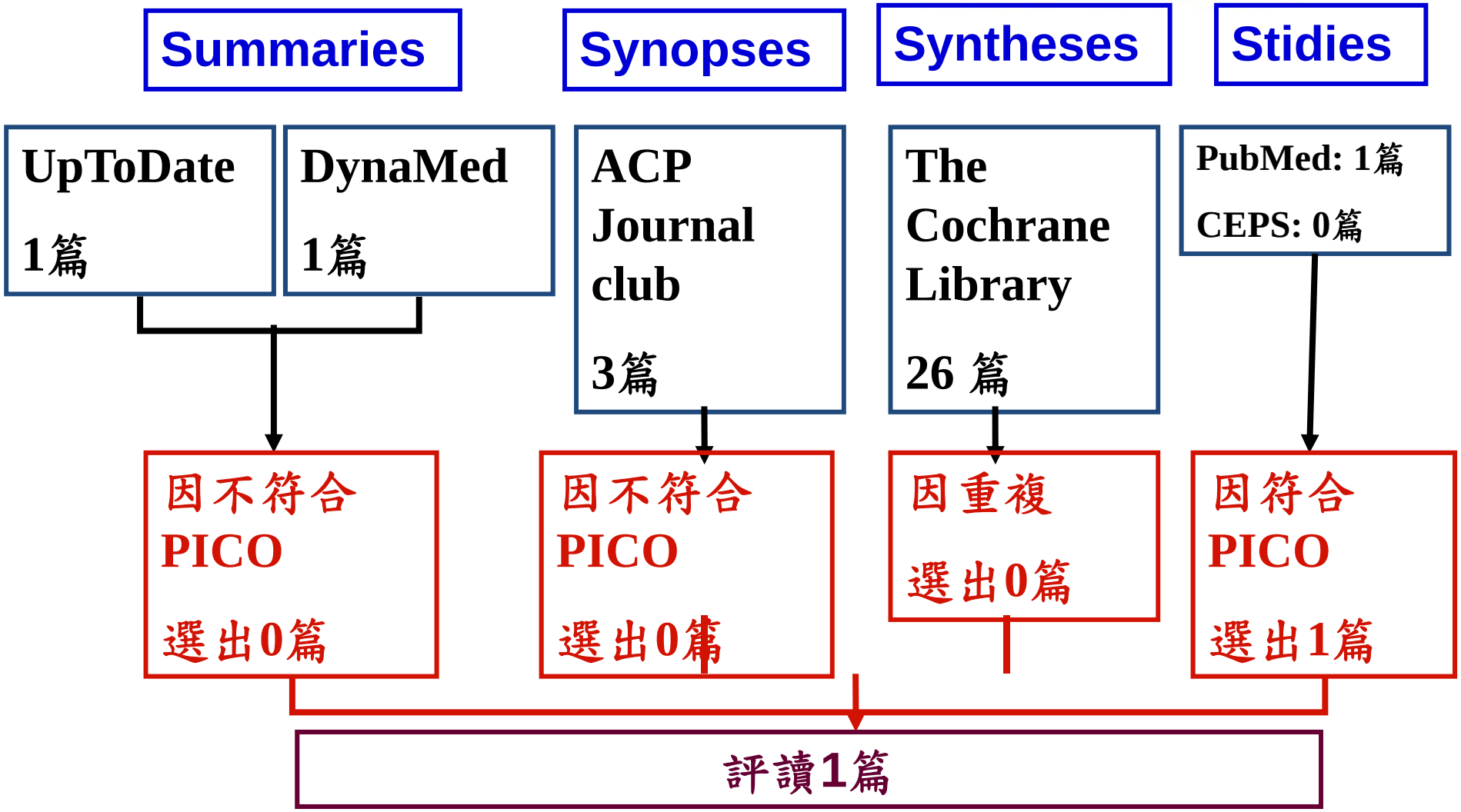
Search

See more...

Recent activity

Turn Off Clear

搜尋過程與結果


Summaries
Synopses
Syntheses
Stidies
UpToDate
1篇
DynaMed
1篇
ACP Journal club
3篇
The Cochrane Library
26 篇
PubMed: 1篇
CEPS: 0篇
因不符合PICO
選出0篇
因不符合PICO
選出0篇
因重複
選出0篇
因符合PICO
選出1篇
評讀1篇

Step 3 – Appraisal

謹慎的文獻評讀

證據等級

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

比對PICO

- 此項研究與我們的PICO是否符合？

	此項研究	我們的PICO	YES	NO
P	The patients suspected CAD	65y/o male with history of smoking, hypertension and diabetes mellitus. Recent symptoms: angina and chest tightness, suspected CAD	V	
I	64-slice computed tomography	64-slice computed tomography	V	
C	Coronary angiography	Coronary angiography	V	
O	Diagnostic accuracy	Diagnostic accuracy	V	

文獻評讀的工具

- Systemic Review appraisal worksheet (CEBM, 2010)

SYSTEMATIC REVIEW: Are the results of the review valid?

What question (PICO) did the systematic review address?	
What is best?	Where do I find the information?
The main question being addressed should be clearly stated. The exposure, such as a therapy or diagnostic test, and the outcome(s) of interest will often be expressed in terms of a simple relationship.	The ***Title, Abstract*** or final paragraph of the ***Introduction*** should clearly state the question. If you still cannot ascertain what the focused question is after reading these sections, search for another paper!
This paper: Yes ☐ No ☐ Unclear ☐ Comment:	
F - Is it unlikely that important, relevant studies were missed?	
What is best?	Where do I find the information?
The starting point for comprehensive search for all relevant studies is the major bibliographic databases (e.g., Medline, Cochrane, EMBASE, etc) but should also include a search of reference lists from relevant studies, and contact with experts, particularly to inquire about unpublished studies. The search should not be limited to English language only. The search strategy should include both MESH terms and text words.	The ***Methods*** section should describe the search strategy, including the terms used, in some detail. The ***Results*** section will outline the number of titles and abstracts reviewed, the number of full-text studies retrieved, and the number of studies excluded together with the reasons for exclusion. This information may be presented in a figure or flow chart.
This paper: Yes ☐ No ☐ Unclear ☐ Comment:	
A - Were the criteria used to select articles for inclusion appropriate?	
What is best?	Where do I find the information?
The inclusion or exclusion of studies in a systematic review should be clearly defined a priori. The eligibility criteria used should specify the patients, interventions or exposures and outcomes of interest. In many cases the type of study design will also be a key component of the eligibility criteria.	The ***Methods*** section should describe in detail the inclusion and exclusion criteria. Normally, this will include the study design.
This paper: Yes ☐ No ☐ Unclear ☐ Comment:	
A - Were the included studies sufficiently valid for the type of question asked?	
What is best?	Where do I find the information?
The article should describe how the quality of each study was assessed using predetermined quality criteria appropriate to the type of clinical question (e.g., randomization, blinding and completeness of follow-up).	The ***Methods*** section should describe the assessment of quality and the criteria used. The ***Results*** section should provide information on the quality of the individual studies.
This paper: Yes ☐ No ☐ Unclear ☐ Comment:	
T - Were the results similar from study to study?	
What is best?	Where do I find the information?
Ideally, the results of the different studies should be similar or homogeneous. If heterogeneity exists the authors may estimate whether the differences are significant (chi-square test). Possible reasons for the heterogeneity should be explored.	The ***Results*** section should state whether the results are heterogeneous and discuss possible reasons. The forest plot should show the results of the chi-square test for heterogeneity and if discuss reasons for heterogeneity, if present.

This paper: Yes ☐ No ☐ Unclear ☐

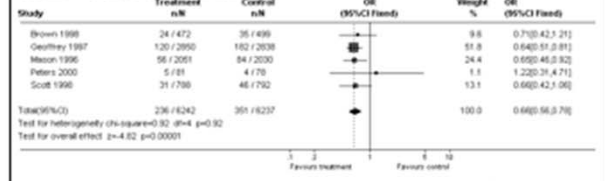
Comment:

What were the results?

How are the results presented?

A systematic review provides a summary of the data from the results of a number of individual studies. If the results of the individual studies are similar, a statistical method (called meta-analysis) is used to combine the results from the individual studies and an overall summary estimate is calculated. The meta-analysis gives weighted values to each of the individual studies according to their size. The individual results of the studies need to be expressed in a standard way, such as relative risk, odds ratio or mean difference between the groups. Results are traditionally displayed in a figure, like the one below, called a **forest plot.**

Comparison: 03 Treatment versus Placebo
Outcome: 01 Effect of treatment on mortality



The forest plot depicted above represents a meta-analysis of 5 trials that assessed the effects of a hypothetical treatment on mortality. Individual studies are represented by a black square and a horizontal line, which corresponds to the point estimate and 95% confidence interval of the odds ratio. The size of the black square reflects the weight of the study in the meta-analysis. The solid vertical line corresponds to "no effect" of treatment - an odds ratio of 1.0. When the confidence interval includes 1 it indicates that the result is not significant at conventional levels (P>0.05).

The diamond at the bottom represents the combined or pooled odds ratio of all 5 trials with its 95% confidence interval. In this case, it shows that the treatment reduces mortality by 34% (OR 0.66 95% CI 0.56 to 0.78). Notice that the diamond does not overlap the "no effect" line (the confidence interval doesn't include 1) so we can be assured that the pooled OR is statistically significant. The test for overall effect also indicates statistical significance (p< 0.0001).

Exploring heterogeneity

Heterogeneity can be assessed using the "eyeball" test or more formally with statistical tests, such as the Cochran Q test. With the "eyeball" test one looks for overlap of the confidence intervals of the trials with the summary estimate. In the example above note that the dotted line running vertically through the combined odds ratio crosses the horizontal lines of all the individual studies indicating that the studies are homogenous. Heterogeneity can also be assessed using the Cochran chi-square (Cochran Q). If Cochran Q is statistically significant there is definite heterogeneity. If Cochran Q is not statistically significant but the ratio of Cochran Q and the degrees of freedom (Q/df) is > 1 there is possible heterogeneity. If Cochran Q is not statistically significant and Q/df is < 1 then heterogeneity is very unlikely. In the example above Q/df is <1 (0.92/4= 0.23) and the p-value is not significant (0.92) indicating no heterogeneity.

Note: The level of significance for Cochran Q is often set at 0.1 due to the low power of the test to detect heterogeneity.

Final choice

Paech and Weston *BMC Cardiovascular Disorders* 2011, **11**:32
http://www.biomedcentral.com/1471-2261/11/32

BMC Cardiovascular Disorders

RESEARCH ARTICLE Open Access

A systematic review of the clinical effectiveness of 64-slice or higher computed tomography angiography as an alternative to invasive coronary angiography in the investigation of suspected coronary artery disease

Daniel C Paech* and Adèle R Weston

- 此篇文章納入理由
  - 最符合臨床問題
  - 最佳研究設計
  - 發表年份較新
  - 有全文可供評讀

Critical Appraisal

Valid: Systematic review worksheet

Importance: what were the result?

Applicability: population and feasibility

What question did the systematic review addressed (PICO) 想要回答什麼問題？

■ 是	□ 否	□ 不清楚

應清楚闡明文章想要回答的問題，暴露因子(包括治療、檢驗等)與結果的因果關係簡單明瞭

評論：

RESEARCH ARTICLE Open Access

A systematic review of the clinical effectiveness of 64-slice or higher computed tomography angiography as an alternative to invasive coronary angiography in the investigation of suspected coronary artery disease

Background: This systematic review summarized recent evidence pertaining to the clinical effectiveness of 64-slice or higher computed tomography angiography (CTA) in patients with suspected coronary artery disease (CAD). If CTA proves to be a successful diagnostic performance measure, it could prevent the use of invasive diagnostic procedures in some patients. This would provide multiple health and cost benefits, particularly for under resourced areas where invasive coronary angiography is not always available.

有清楚描述想利用64 slice CT 去代替 coronary angiography

Is it unlikely that important, relevant studies were missed 沒有遺漏重要的文獻？

■是	□否	□ 不清楚

The HTA report had a search date end of December 2006. For this review, searches were limited to English language material published from between December 2006 and March 2009. The primary computerized search was conducted by cross-searching EMBASE, Medline, the Cochrane library and HTA databases. Individual search strategies for each electronic database, using relevant subject headings, were undertaken based on the literature search by Mowatt *et al* [10]. These included the following keywords: coronary artery disease, myocardial ischemia, ischemic heart disease, myocardial infarction, chest pain, angina, stenosis, computed tomography, computer assisted tomography, computed tomographic angiography, invasive coronary angiography and coronary angiogram.

Were the criteria used to select articles for inclusion appropriate 選擇文獻的準則適當?

■ 是

Study eligibility

Titles and abstracts of identified studies were screened for possible inclusion or exclusion before retrieving full text versions of the publications. Included studies were those that compared the diagnostic accuracy of CTA to ICA in patients with suspected CAD. As opposed to the broader review by Mowatt *et al* [10], this review did not include prognostic studies, technical studies (e.g. image quality), assessment studies, or post-revascularisation studies. Citations were excluded if they were reported as a conference abstract, not a diagnostic performance study; they included the wrong intervention (i.e. not 64-slice or higher CTA); they did not report diagnostic performance results relating to the identified outcome of interest (≥50% stenosis); or if they had fewer than 50 study participants receiving both CTA and the reference standard. Double-checking of the eligibility of studies by a second reviewer was not undertaken.

Part of the criteria for determining study eligibility was that articles reported either the absolute number of true positives, false positives, false negatives and true negatives, or sensitivity and specificity. Due to the nat-

Were the included studies sufficiently valid for the type of question asked
選擇的文獻有效回答所問的問題?

■ 是	□ 否	□ 不清楚

Appraisal of included studies

Each of the included studies was reviewed and assigned a level of evidence in accordance with the National Health and Medical Research Council (NHMRC) of Australia diagnostic levels of evidence [11]. In addition, in accordance with the review by Mowatt and colleagues [10], individual study quality for this update was assessed using a modified version of the Quality Assessment of Diagnostic Studies (QUADAS) tool. Quality criteria were tabulated in the data extraction form, rather than used to formulate a numeric score.

Systematic review worksheet

Were the results similar from study to study
各研究的結果相似?

☐是 ☐否 ■不清楚

Study	TP	FP	FN	TN	Sensitivity	Specificity
Achenbach *et al* 2008	80	26	8	86	91	77
Cademartiri *et al* 2007	20	1	0	51	100	98
Ghostine *et al* 2008	42	4	1	46	98	92
Herzog *et al* 2007	19	6	0	30	100	83
Husmann *et al* 2008	40	8	3	37	93	82
Leschka *et al* 2008a	35	5	1	33	97	87
Leschka *et al* 2008b	69	8	2	35	97	81
Meijboom *et al* 2008	244	41	2	73	99	64
Mejboom *et al* 2007a	88	4	0	12	100	75
Mejboom *et al* 2007c	124	18	2	110	98	86
Mejboom *et al* 2007b	251	24	2	125	99	84
Oncel *et al* 2007	62	0	0	18	100	100
Piers *et al* 2008	38	12	0	10	100	45
Pugliese *et al* 2008	38	0	0	13	100	100
Rixe *et al* 2009	40	6	0	30	100	83
Scheffel *et al* 2008	66	4	0	50	100	93
Shabestari *et al* 2007	104	10	4	20	96	87
Weustink *et al* 2007	76	3	1	20	99	67
Pooled statistic						

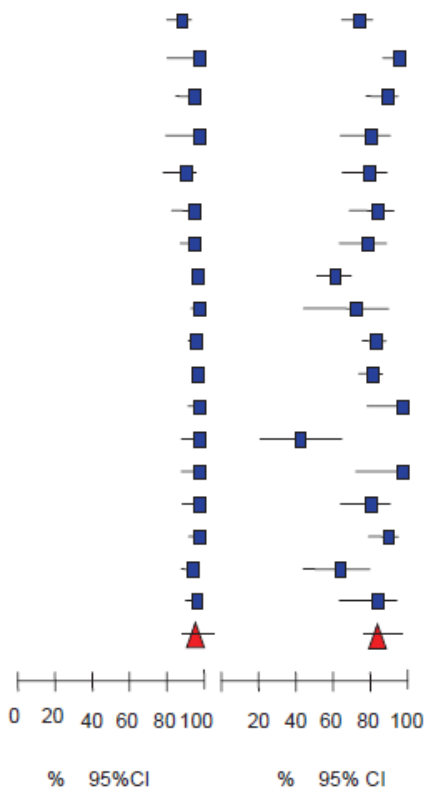


Figure 1 Sensitivity and specificity for the base case meta-analysis at the patient level. CI, confidence interval; FN, false negative; FP, false positive; TN, true negative; TP, true positive.

Systematic revie

Were the results similar from study to study
各研究的結果相似?

☐ 是	☐ 否	■ 不清楚

Study	TP	FP	FN	TN	PPV	NPV
Achenbach *et al* 2008	80	26	8	86	75	91
Cademartiri *et al* 2007	20	1	0	51	95	100
Ghostine *et al* 2008	42	4	1	46	91	98
Herzog *et al* 2007	19	6	0	30	76	100
Husmann *et al* 2008	40	8	3	37	83	93
Leschka *et al* 2008a	35	5	1	33	88	97
Leschka *et al* 2008b	69	8	2	35	90	95
Meijboom, Meijs 2008	244	41	2	73	86	97
Mejboom *et al* 2007a	88	4	0	12	96	100
Mejboom *et al* 2007c	124	18	2	110	87	98
Mejboom *et al* 2007b	251	24	2	125	91	98
Oncel *et al* 2007	62	0	0	18	100	100
Piers *et al* 2008	38	12	0	10	76	100
Pugliese *et al* 2008	38	0	0	13	100	100
Rixe *et al* 2009	40	6	0	30	87	100
Scheffel *et al* 2008	66	4	0	50	94	100
Shabestri *et al* 2007	104	10	4	20	91	83
Weustink *et al* 2007	76	3	1	20	96	95

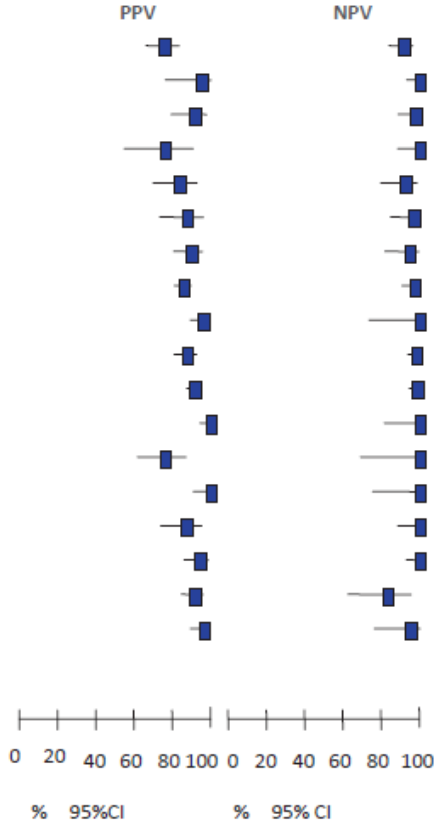


Figure 2 PPV and NPV for the base case met-analysis at the patient level. CI, confidence interval; FN, false negative; FP, false positive; TN, true negative; TP, true positive.

Systematic

How are the results presented?

研究結果如何呈現?

☐是	☐ 否	■ 不清楚

Table 2 CTA diagnostic performance measures

Analysis level	No. of included studies [a]	Sensitivity % (95% CI)	Specificity % (95% CI)	PPV Median (range)	NPV Median (range)	Diagnostic accuracy Median (range)
Patient: base case analysis	18	98.2 (97.4-98.8)	81.6 (79.0-84.0)	90.5 (76-100)	99.0 (83-100)	92.0 (80-100)
Patient: alternative analysis	22	98.0 (97.2-98.6)	83.2 (81.1-85.2)	89.0 (63-100)	98.0 (83-100)	92.0 (80-100)
Vessels: all	17	94.9 (93.9-95.8)	89.5 (88.8-90.2)	75.0 (53-95)	99.0 (93-100)	91.5 (74-98)
RCA	8	94.8 (92.0-96.9)	91.0 (89.0-92.7)	84.0 (73-94)	98.5 (95-100)	94.5 (84-99)
LM	8	95.7 (85.2-99.5)	97.1 (95.7-98.1)	89.0 (24-100)	100.0 (98-100)	99.0 (91-100)
LAD	7	97.4 (95.3-98.8)	84.5 (82.1-86.7)	78.0 (57-95)	99.0 (95-100)	93.0 (72-99)
CX	8	94.1 (90.7-96.6)	89.6 (87.7-91.3)	78.5 (52-90)	99.5 (95-100)	94.0 (75-99)
Segments: all	17	91.3 (90.2-92.2)	94.0 (93.7-94.2)	69.0 (44-86)	99.0 (98-100)	95.5 (90-99)

CI, confidence interval; CX, circumflex; LAD, left anterior descending; LM, left main; NPV, negative predictive value; PPV, positive predictive value; RCA, right coronary artery

[a] Maximum number of included studies from which data were drawn to calculate diagnostic performance measures

Systematic review worksheet

並無forest plot 以呈現各研究結果的異質性

Likelihood Ratios

$$LR(+) = \frac{\text{sensitivity}}{\text{1 - specificity}}$$

$$LR(-) = \frac{\text{1 - sensitivity}}{\text{specificity}}$$

Pretest odds = prevalence / (1 – prevalence)

↓

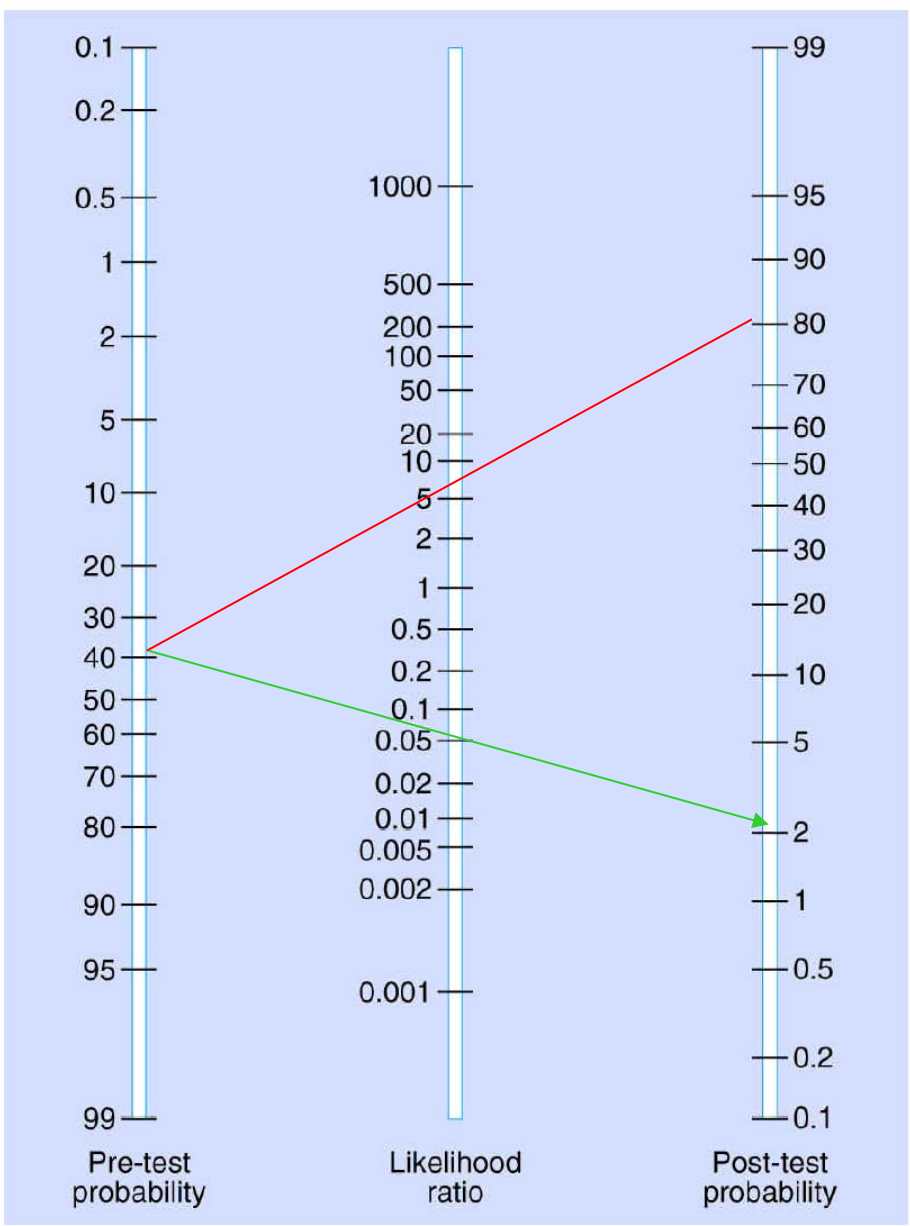
Pretest odds x LR = Posttest odds

↓

Posttest Probability =posttest odds / posttest odds+1

The Likelihood Nomogram

LR(+)= 9
LR(-)=0.05



CEBM System review 總評讀表

Appraisal questions	Yes	No	Unclear
想要回答什麼問題？	V		
有否遺漏重要文獻？	V		
選擇文獻的準則是否適當？	V		
選擇的文獻是否能有效回答問題？	V		
各研究的結果是否相似？			V
研究結果如何呈現？			V

證據等級

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

Step 4 – Apply
臨床應用

- Evidence(研究的證據)
- 研究證據的結果顯示64切電腦斷層可以有效的偵測出心臟冠狀動脈疾病
- 研究的病患屬性部分與個案的屬性相符合
- 心導管檢查一般費用為1500元，但電腦斷層則須負擔費用15000元，然而長期而言，可以盡早降低急性心肌梗塞的發生，成本上仍具相當程度的效益。

成本效益？

備註：

1.依健保局規定，若經心導管檢查後，無冠狀動脈阻塞則需自付顯影劑費用1500元。

2.若有血管擴張術或植入血管支架，則出院時需自付健保局未給付之特殊醫材。

3.以上兩項需填寫自願付費同意書，請於病房填寫手術同意書時配合填寫。

聖保祿醫院 健康管理中心

64 切電腦斷層掃描檢查

檢查項目		顯影劑	費用(NT)	檢查時間	服務特色	建議受檢對象
心臟血管檢查	冠狀動脈血管及鈣化分析	✓	15000	30 分鐘	★可呈現 3D 冠狀動脈分枝，診斷心臟冠狀動脈狹窄程度及心臟病發生機率	★罹患**冠狀動脈疾病高危險群**：高血壓、高血脂、糖尿病、長期抽煙者、嗜吃高脂肪、高膽固醇食物、酗酒、有心血管疾病家族史
	冠狀動脈鈣化分析		6000	15 分鐘	★屬非侵襲性檢查、速度快、解析度高，免除穿刺動脈與放置導管所帶來的壓力與風險	★有胸悶胸痛病史、親友中有罹患冠狀動脈心臟病者；有做過冠狀動脈支架、冠狀動脈繞道手術之追蹤檢查
頭頸部血管及腫瘤檢查		✓	12000	20 分鐘	★可偵測頭、頸部血管異常及腫瘤組織病變，為頸動脈狹窄、腦中風等頸動脈病變檢測的利器	★頸部動脈狹窄者、下背痛、高血壓、糖尿病、心臟病、曾短暫缺血者、不良生活習慣、銀髮族 ★常頭暈頭痛、有腦瘤家族史、曾罹患頭頸部疾病、下肢循環不良者

Step 4 – Apply
臨床應用

- Expectation(病患的選擇及期待)
  - 建議此檢查時宜考量病患的經濟狀況
  - 病人可能贊成的理由為可藉由非侵入性的檢查即可早期偵測冠狀動脈疾病，但不贊成的理由可能為需額外自費的部分
  - 與病患討論對此結果的期待，並告知不用額外的侵入性檢查，讓其瞭解64切電腦斷層的結果。

Step 4 – Apply
臨床應用

- Experience(臨床的經驗)
  - 研究的證據並未與臨床的經驗相衝突
  - 此實證結果可提供醫療人員向病患及家屬解釋其選擇方案時的考量
- Environment(環境因素)
  - 在推行上須考量醫院現實是否有足夠的設備可提供給病患選擇
  - 若現實醫院無適當的設備，仍可建議病患至此設備的醫院讓病患選擇
  - 可提議院內採納此設備，以增進病患多元性的選擇方案

結合病人價值
幫助病人做出最後的決定

醫療現況	病人意願
病患出現心絞痛相關症狀，不確定是否有冠狀動脈阻塞，需要進一步檢查。	病人對是否接受心導管手術有所疑慮。
生活品質	**社會脈絡**
64切心臟電腦斷層掃描相較於心導管手術，屬於非侵入性檢查，且陰性預測值高，若真有異狀，再施行心導管手術確診，對病患的生活品質應有較佳影響。	64切心臟電腦斷層掃描費用較高(約台幣15000元)，而單純心導管檢查為1500元，但較不侵入性之檢查為較受考慮之選擇。

結合實證醫學的結果與臨床專業經驗給予病人建議

- 我們的臨床建議是：可藉由非侵入性的檢查即可早期偵測冠狀動脈疾病，且陰性預測值高，若真有異狀，再施行心導管手術確診，對病患的生活品質應有較佳影響。

－此項建議之證據等級：Level ?

結語

以上簡報完畢
謝謝各位聆聽
敬請指教