實證醫學 病例討論報告

Evidence-Based Medicine

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眼科

Outline

- Clinical scenario-臨床場景
- Asking-提出問題
- Acquire- 搜尋資料
- Appraisal-嚴格評讀
- Apply-臨床應用
- Audit-自我評估

Clinical scenario

PATIENT'S PROFILE

- 曾O博, 26986263, 3 months old baby
- Diagnosis：1.Congenital cataract(OU)
  2.Esotropia(OS)
- Treatment：Arrange Phacoemulsification+posterior capsulotomy+anterior vitrectomy+peripheral iridectomy(OU) on 2011-8-16

ASKING

Background question

Q1: What is the common etiology of pediatric cataract?
Q2: What is the most common morphologies of pediatric cataract?
Q3 What is the surgical indication of pediatric cataract?

Q1 What is the common etiology of pediatric cataract?

- 資料出處：American Academy of Ophthalmology
- Type:
  - Isolated or part of a systemic condition
  - Congenital or acquired
  - Inherited or sporadic
  - Unilateral or bilateral
  - Partial or complete
  - Stable or progressive

Etiology

Table 21-1 Etiology of Pediatric Cataracts

- **Bilateral cataracts**
  - Idiopathic
  - Familial (hereditary), usually autosomal dominant
  - Chromosomal abnormality
    - Trisomy-21 (Down), -18 (Edward), -13 (Patau)
    - Other translocations, deletions, and duplications
  - Craniofacial syndromes
    - Hallermann-Streiff, Rubenstein-Taybi, Smith-Lemli-Opitz, others
  - Musculoskeletal
    - Conradi, Albright, myotonic dystrophy
  - Renal
    - Lowe, Alport
  - Metabolic
    - Galactosemia, Fabry, Wilson, mannosidosis, diabetes mellitus
  - Maternal infection (TORCH diseases)
    - Rubella
    - Cytomegalovirus
    - Varicella
    - Syphilis
    - Toxoplasmosis
  - Ocular anomalies
    - Aniridia
    - Anterior segment dysgenesis syndrome
  - Iatrogenic
    - Corticosteroids
    - Radiation (may also be unilateral)
- **Unilateral cataracts**
  - Idiopathic
  - Ocular anomalies
    - Persistent fetal vasculature (PFV)
    - Anterior segment dysgenesis
  - Traumatic (rule out child abuse)

Causes of congential cataract

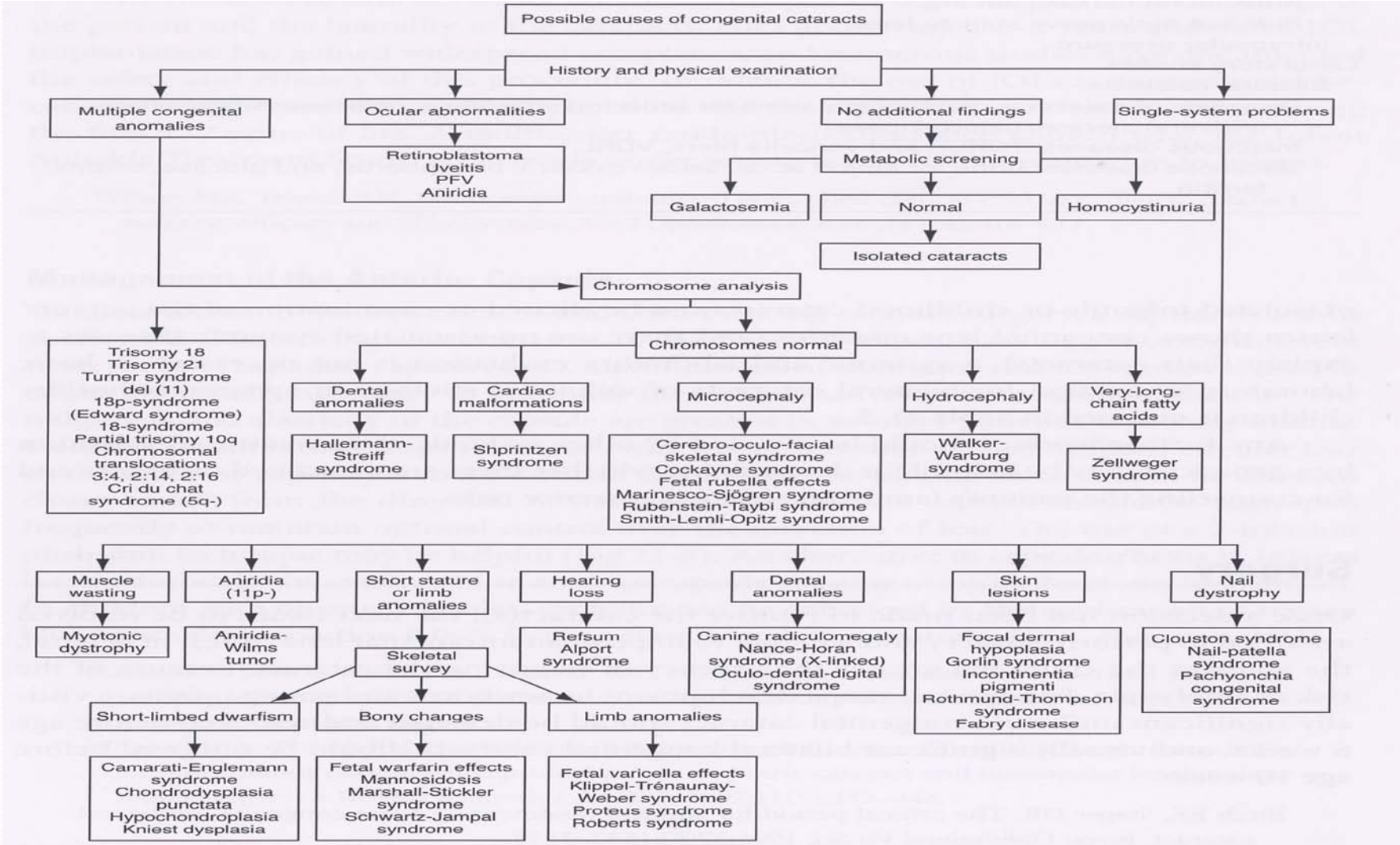


Figure 21-7 Causes of congenital cataracts. *PFV* = persistent fetal vasculature. *(Adapted from Buckley EG. Pediatric cataracts. In: Parrish R, ed.* Bascom Palmer Eye Institute's Atlas of Ophthalmology. *Philadelphia: Current Medicine; 2000.)*

Q2 What is the most common morphologies of pediatric cataract?

- 資料出處：American Academy of Ophthalmology
- **Anterior polar cataract**:
  - usually <3 mm in diameter, congenital, usually sporadic, bilateral or unilateral, usually non-progressive
- **Nuclear cataract:**
  - typically approximately 3mm in diameter, opacities tend to be stable but can progress, unilateral or bilateral, inherited or sporadic, congenital but may not be significantly dense at birth, at increased risk for developing glaucoma later in childhood

- **Lamellar cataract (zonular)** :
  - lenticular shape, affect 1 or more of the rings, typically 5mm or more, usually acquired but can be inherited, unilateral or bilateral
- **Posterior lenticonus/lentiglobus**:
  - congenital thinning of the central posterior capsule and cataract dose not form until later, almost always unilateral

- **Posterior subcapsular cataract**:
  - usually in adult, usually acquired and bilateral, may caused by steroid, uveitis, retinal abnormalities, radiation exposure, can be seen with neurofibromatosis type 2
- **Persistent fetal vasculature**:
  - failure of the fetal hyaloid vascular complex to regress

Q3 What is the surgical indication of pediatric cataract?

- 資料出處：American Academy of Ophthalmology
- **The opacities are visually significant**
- **The younger the child, the greater the urgency in removing the cataract, because of the risk of amblyopia.**
- **Newborns and young infants:**
  - Unilateral congenital cataract: before 6 weeks old
  - Bilateral congenital cataracts: before 10 weeks old (before the fixation reflex normally develops)
- **Older children with bilateral cataracts**: 20/40 or less
- **Older children with unilateral cataracts**: <20/40 with optical treatment and amblyopia therapy

(fellow eye: 2 weeks for < 2y/o, 1 month for >2y/o)

- For children aged 1-2 years and older, IOL implantation has gained widespread acceptance, and numerous studies have documented the safety and efficacy of this procedure.
- In infants, the use of IOLs is controversial because of a higher incidence of complications and the rapid shift in refractive error during the first 1-2 years of life.

- 資料出處：Uptodate
- The management of cataracts depends upon the age of the child and potential for interference with visual development.
- We recommend cataract extraction for newborns with bilateral complete cataracts (**Grade 1A**). Surgery should take place as soon as possible, ideally within the first four to six weeks of life. The two eyes should be operated on within one week of each other.
- We suggest surgery for children with incomplete cataracts (unilateral or bilateral) and one or more of the following (**Grade 2C**).
  - Decreased visual response
  - Reduced visual acuity (20/50 level or worse)
  - Opacity >3 mm in diameter
  - Onset of strabismus, which indicates a significant disruption in fusion
- When the natural lens is removed, it must be replaced with an intraocular lens (IOL) or an aphakic contact lens. In addition, bifocal glasses are required for near work. Aphakic contact lenses are usually used for children younger than six to nine months of age, an IOL for older children.

將搜尋的結果應用到我的病人

- 由以上資料可知，在congenital cataract的病人，要先詳細檢查可能合併的疾病，另外只要Cataract擋住visual axis，可能造成弱視，就要考慮盡早開刀（ Bilateral congenital cataracts: before 10 weeks old）。

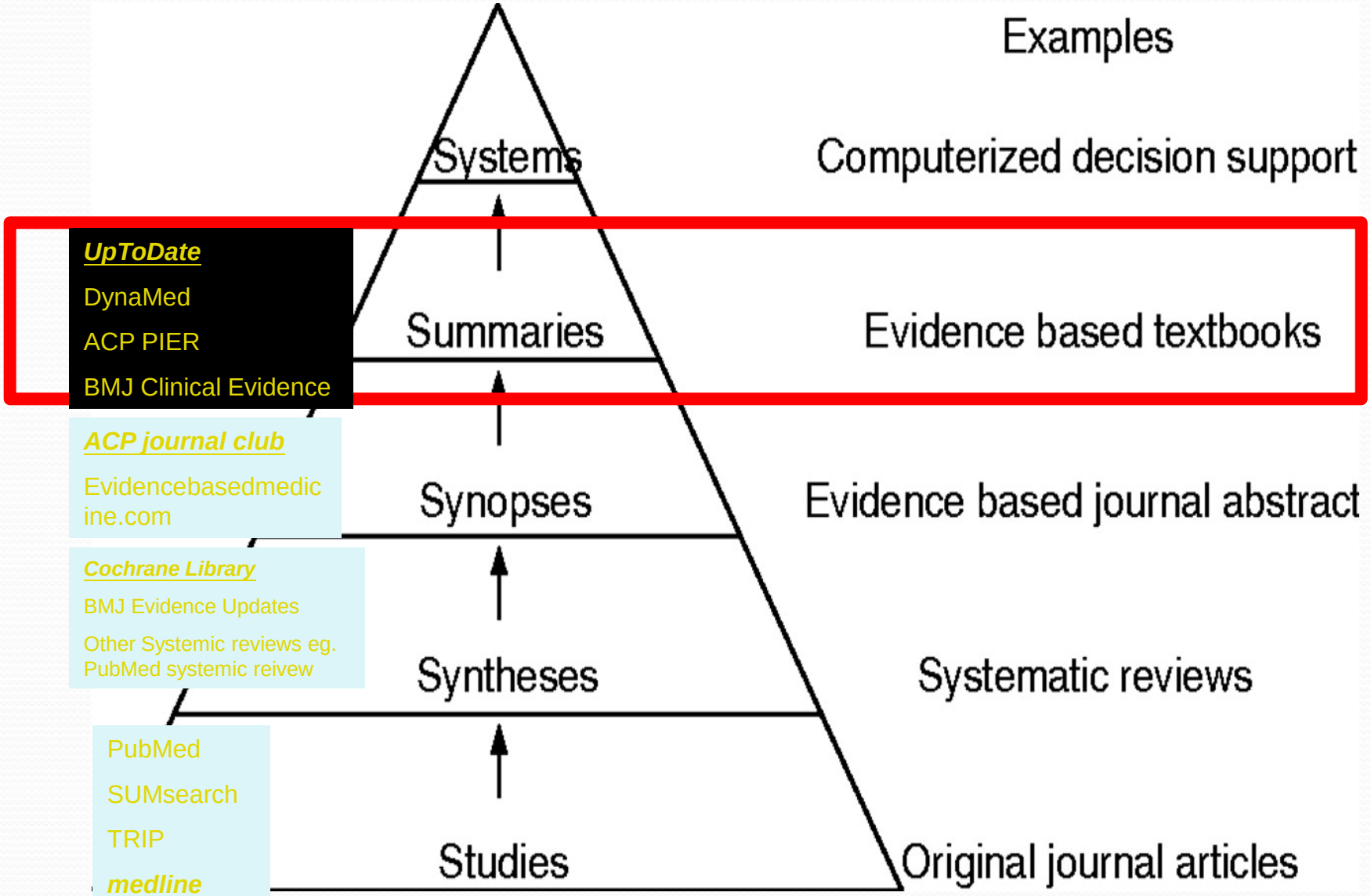
Foreground questions

Should we do primary IOL implantation in Infants with congenital cataract who receive cataract surgery?

PICOT

Patient	Infants who have congential cataract
Intervention	Cataract surgery with primary intraocular lens implantation
Comparison	Without primary intraocular lens implantation
Outcome	Rates and severity of complication；adverse effect；visual acuity
Time	Not confined

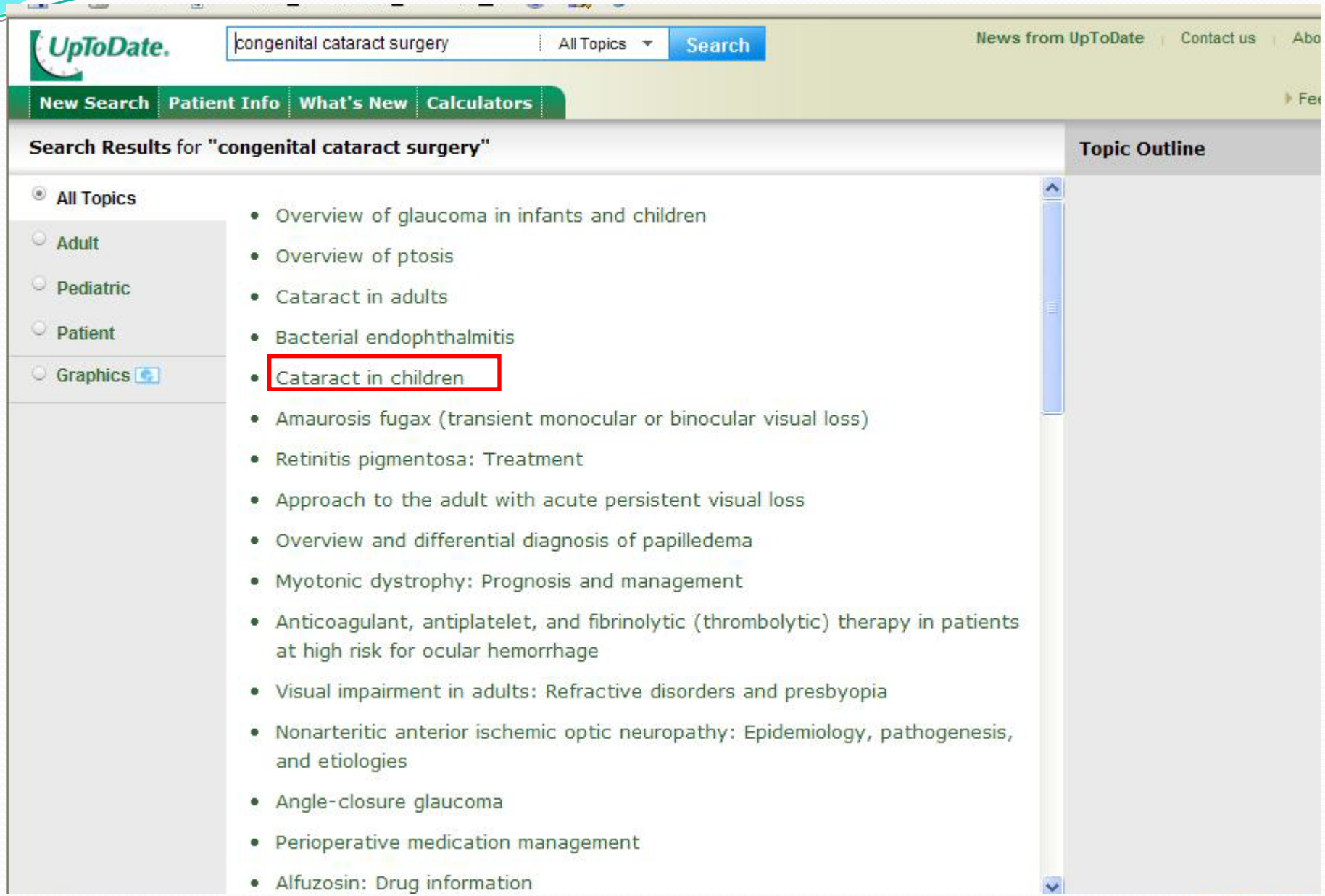
Search strategy: 5S model



搜尋 UpToDate

- Key words
  - Congenital catarat
  - Surgery

Summaries search results~



Aphakic contact lens

- Many ophthalmologists prefer aphakic contact lenses to intraocular lens (IOL) implantation for optical rehabilitation in infants younger than six to nine months of age.
- Some ophthalmologists would consider implanting an IOL in younger infants (ie, three months and older).
- However, the risk of post-operative complications, such as intraocular inflammation and secondary membrane formation, is increased in this age group.
- A major advantage of contact lenses over IOL in infants is the ability to change the power of the lens as the refractive power of the eye changes with ocular growth.

Aphakic contact lens

- A large proportion of ocular growth occurs during the first year of life.
  - The total refractive power of the aphakic eye decreases from +30.75 at birth to +26.36 at one year, +23.00 at two years, and +21.20 at three years.
  - The provision of a clear retinal image (ie, emmetropia) would require a +30 diopter IOL at birth and a +21 diopter lens at three years.
- Infants who are initially rehabilitated with aphakic contact lenses may undergo secondary IOL implantation later in life if contact lenses become more difficult to manage (usually at ≥2 to 3 years of age).

Aphakic contact lens

- Disadvantages to the use of aphakic contact lenses include the need for daily maintenance, risk of corneal infections in association with contact lens wear, and delayed amblyopia therapy with contact lens loss.
- In addition, there is a cost associated with frequent replacement of contact lenses due either to lens loss or the frequent need to change lens power that occurs with normal ocular growth.
- There may also be an increased incidence of strabismus in children with monocular cataract treated with aphakic contact lenses as opposed to IOLs

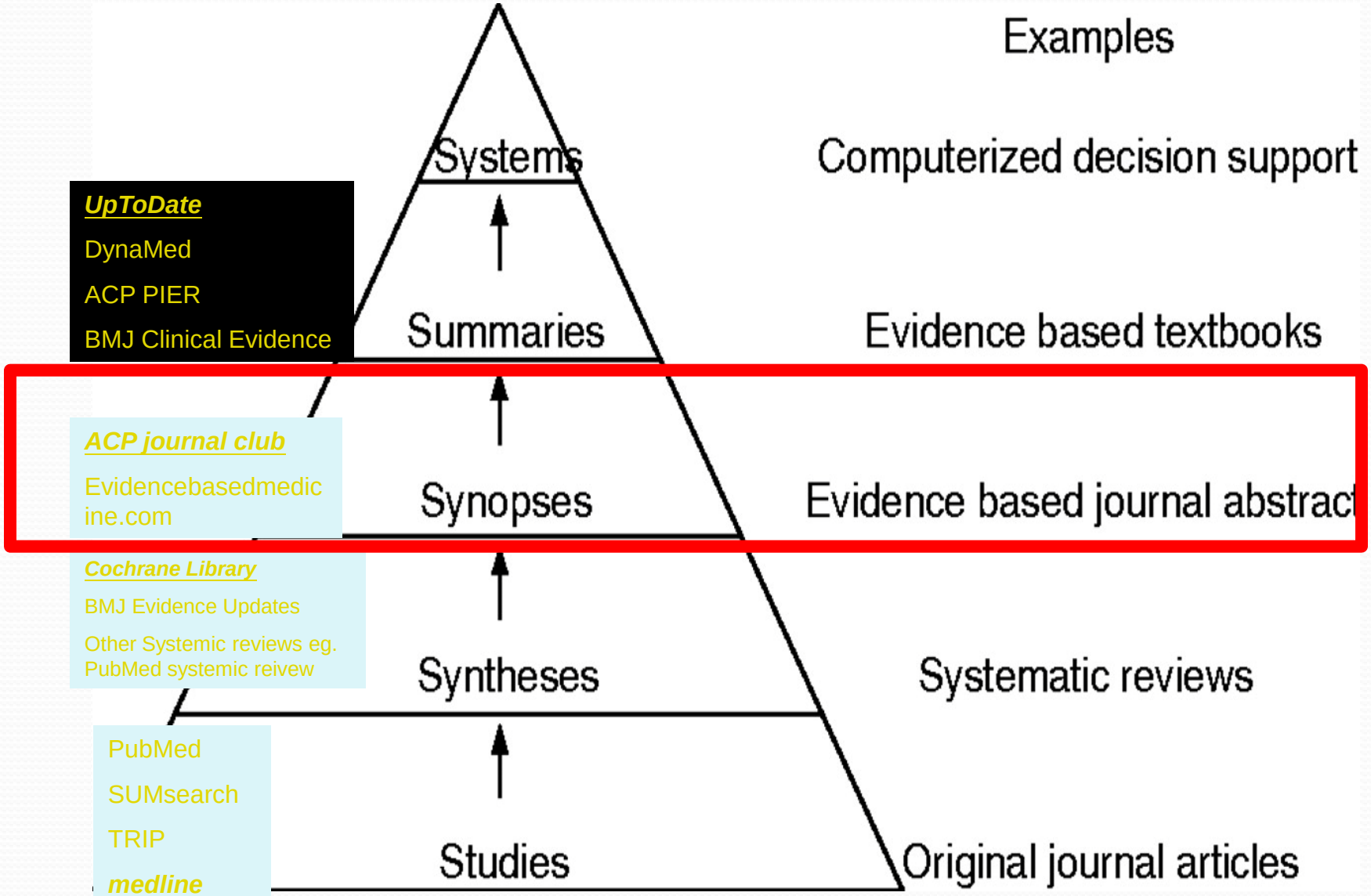
Intraocular lens

- Advantages of an IOL include immediate and full time optical correction (in contrast to contact lenses which require regular insertion).
- In children older than six to nine months, it is generally accepted that IOL implantation (pseudophakia) offers the best opportunity for visual rehabilitation. Nonetheless, ocular growth/IOL power and posterior capsule opacification (secondary cataract) may to pose management problems.
- Most children require glasses with an IOL postoperatively to optimize optical focus and visual rehabilitation. In addition, older children require a bifocal to provide clear near vision. The use of multifocal intraocular lenses in children is investigational.

將Summaries搜尋的結果應用到我的病人

- 根據summaries的結果發現，目前對於Congenital cataract的surgery，是否primary就放入IOL或是使用Aphakic contact lens尚未有定論
- 目前一般認為對於小於6-9個月的infant，比較prefer戴aphakic contact lenses而暫不裝入intraocular lens (IOL).
- 而對於children older than six to nine months，目前一般是認為 IOL implantation (pseudophakia) offers the best opportunity for visual rehabilitation.
- 因此這個病人目前三個月大，應該是比較prefer不直接放入人工水晶體

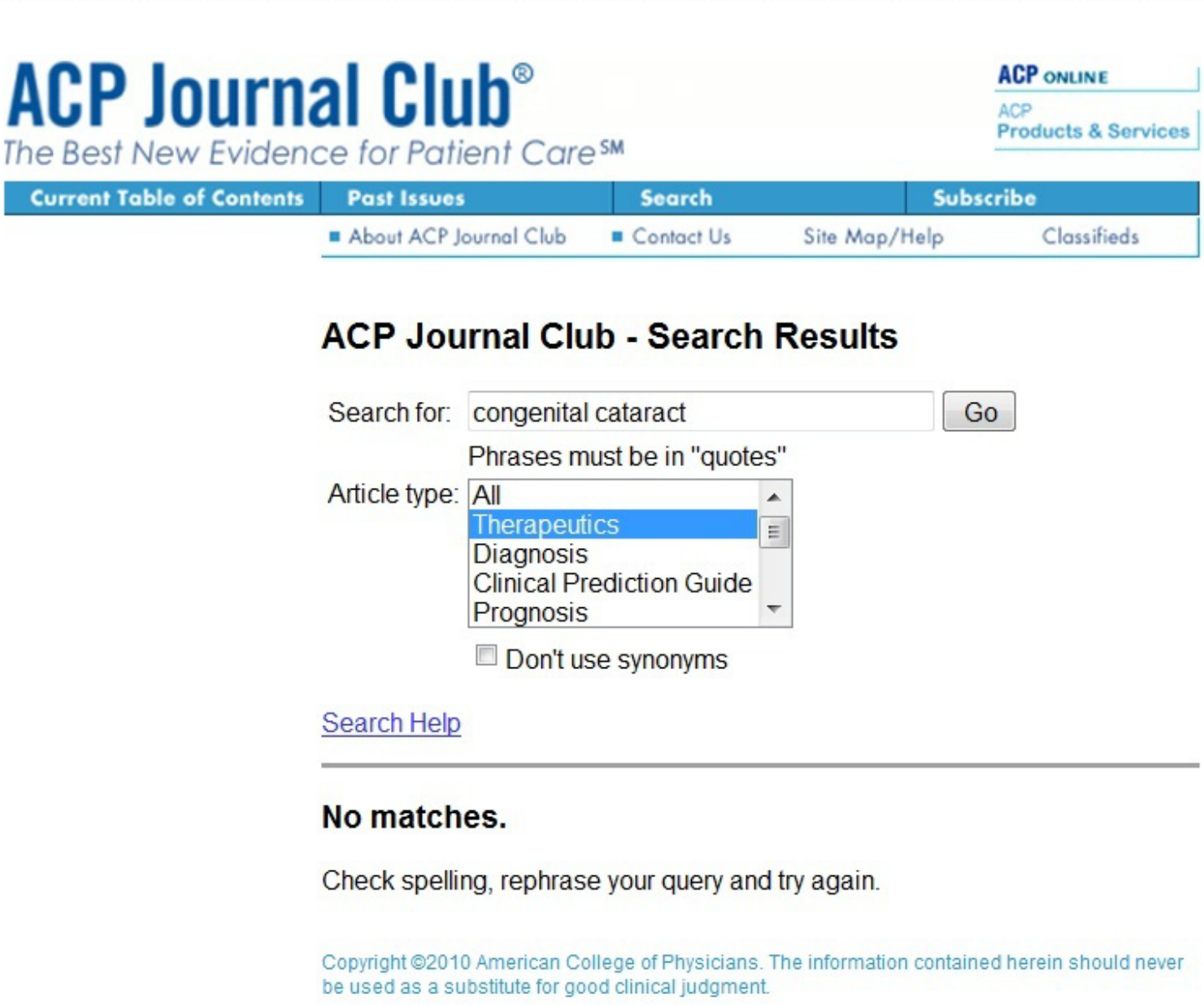
Search strategy: 5S model



搜尋 ACP Journal club

- Key words
  - Congenital cataract

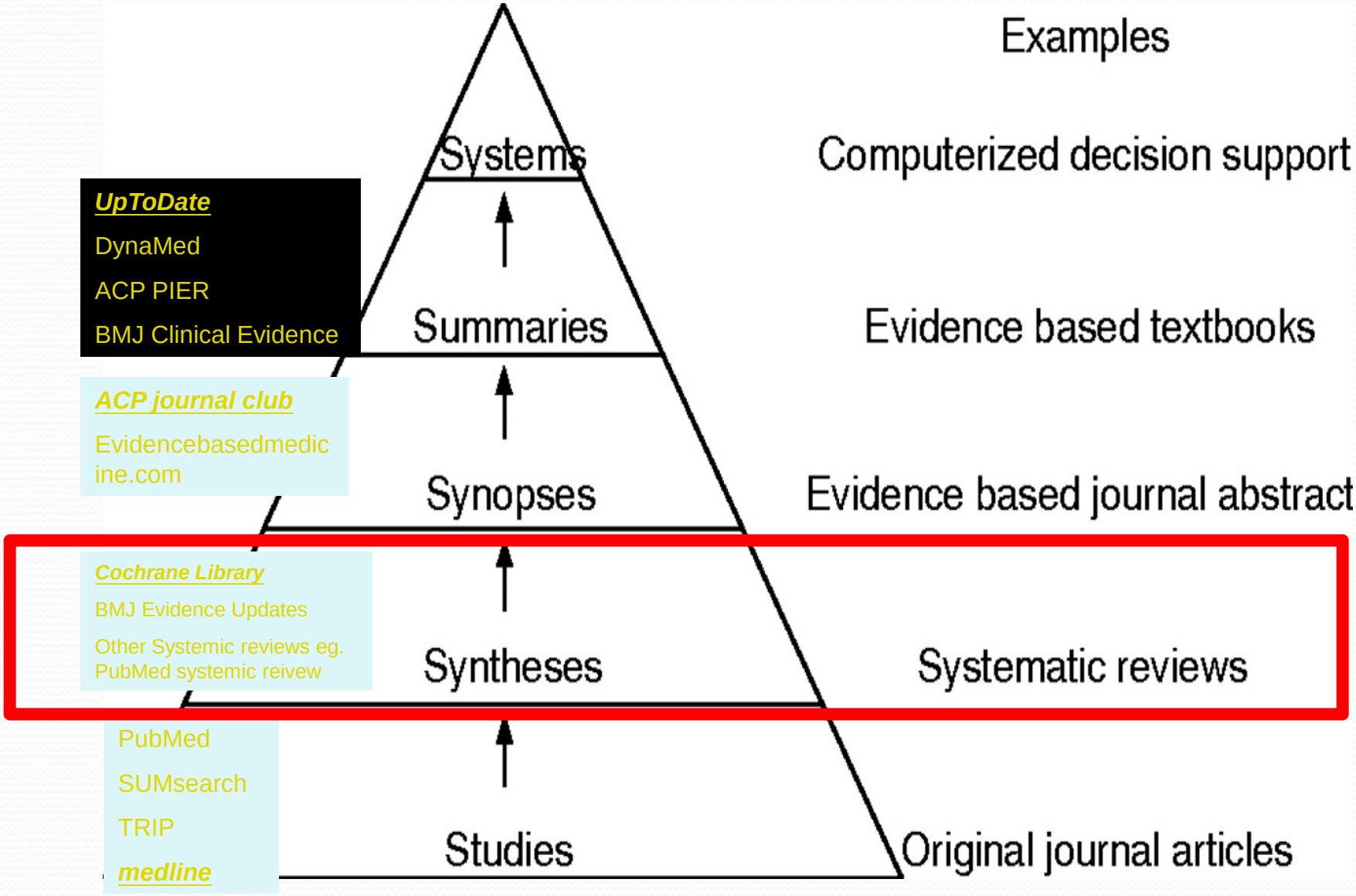
SYNOPSES SEARCH RESULTS



將**SYNOPSES**的搜尋結果應用到我病人身上

- 無探討到congenital cataract surgery是否應該直接primary放入人工水晶體的synopses

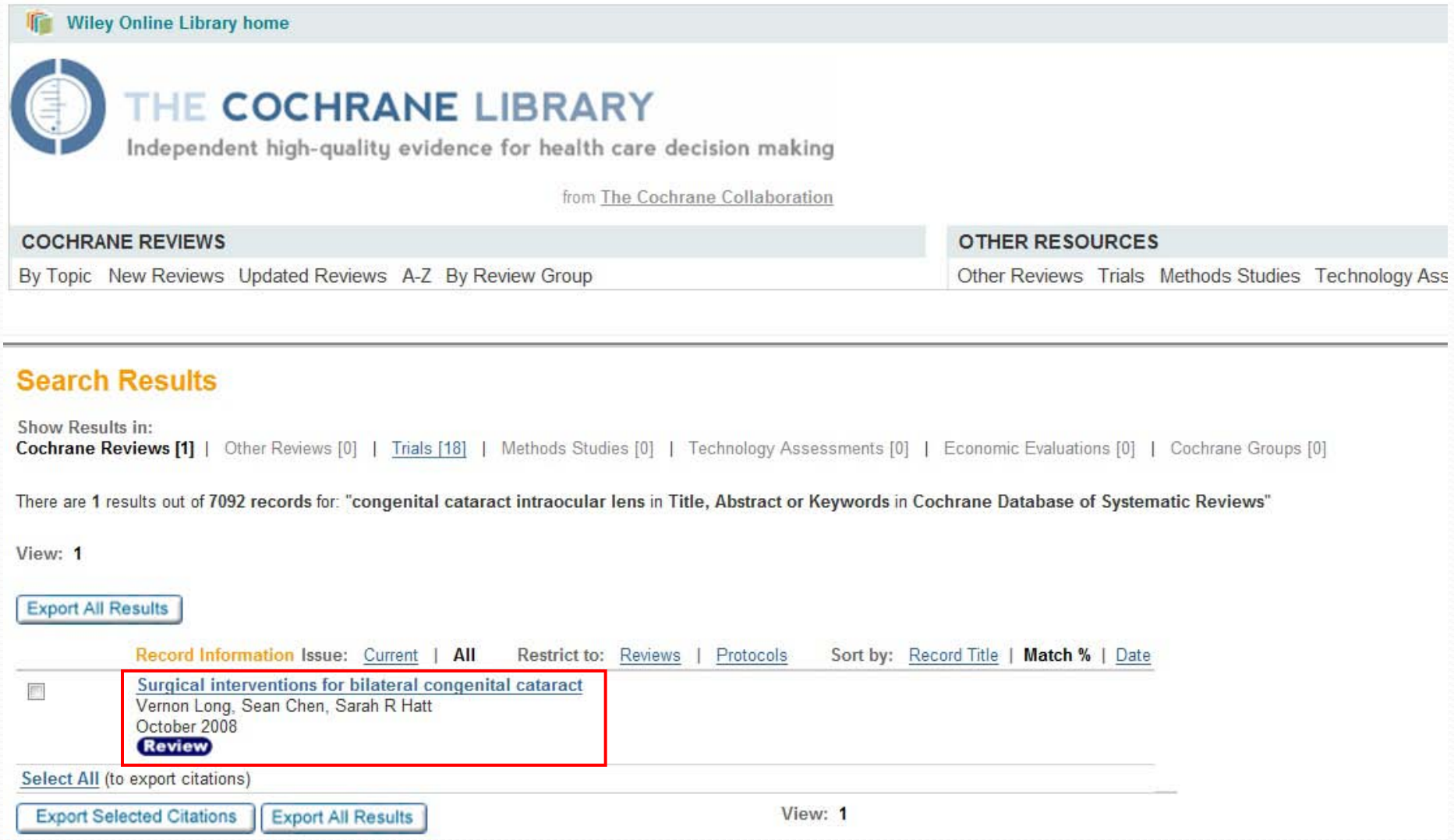
Search strategy: 5S model



搜尋 Cochrane library

- Key words
  - Congenital catarat

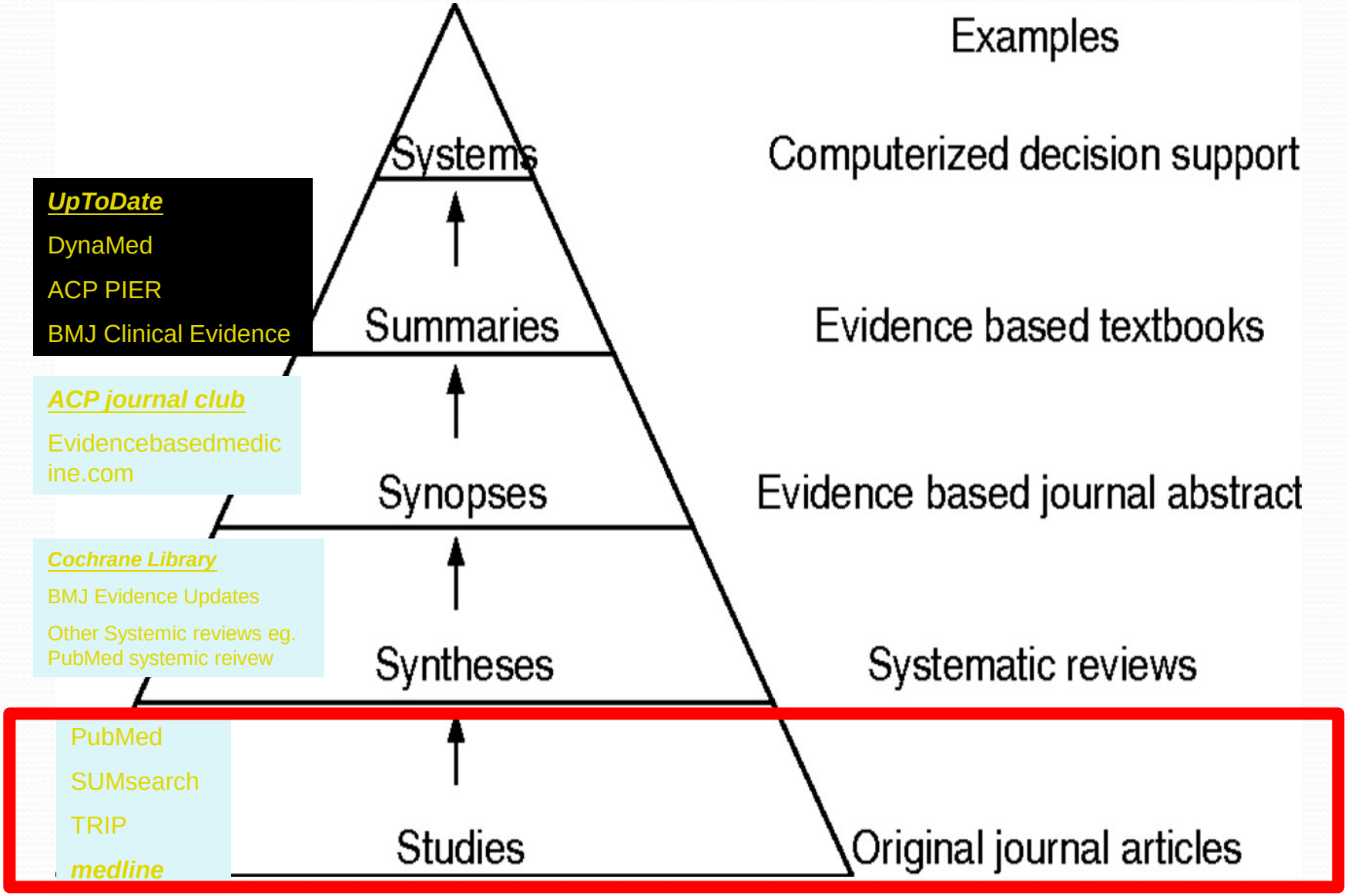
SYNTHESIS SEARCH RESULTS



將**SYNTHESIS**的搜尋結果應用到我病人身上

- 此篇review主要是在比較lensectomy和lens aspiration對於視力的預後及副作用
- 無探討到congenital cataract surgery是否應該直接primary放入人工水晶體的synopses

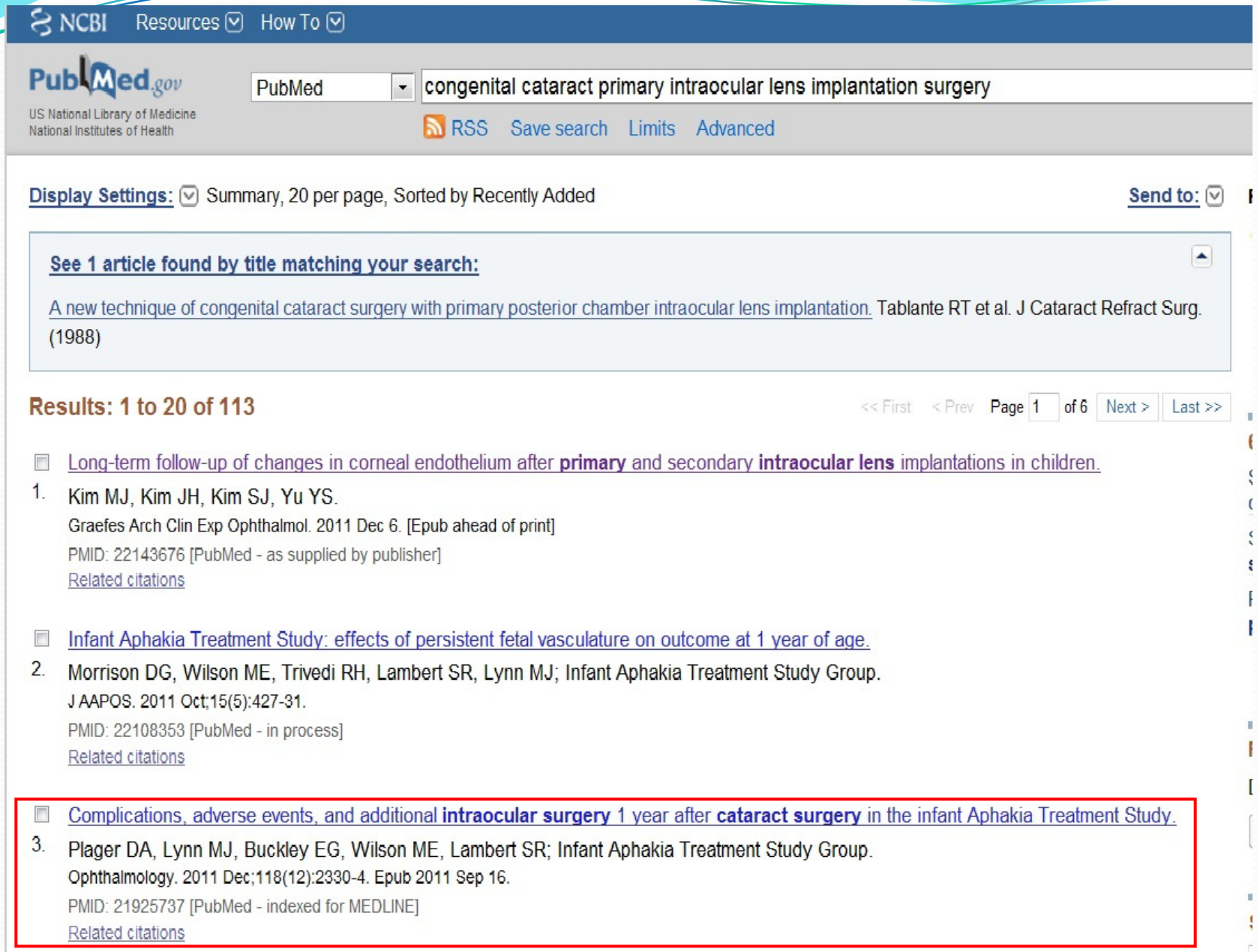
Search strategy: 5S model



搜尋 PubMed~

- Key words
  - Congenital cataract
  - Primary intraocular lens implantation
  - Surgery

STUDY SEARCH RESULTS



NCBI Resources How To

PubMed.gov
US National Library of Medicine
National Institutes of Health

PubMed congenital cataract primary intraocular lens implantation surgery

RSS Save search Limits Advanced

Display Settings: Summary, 20 per page, Sorted by Recently Added Send to:

See 1 article found by title matching your search:

A new technique of congenital cataract surgery with primary posterior chamber intraocular lens implantation. Tablante RT et al. J Cataract Refract Surg. (1988)

Results: 1 to 20 of 113

<< First < Prev Page 1 of 6 Next > Last >>

Long-term follow-up of changes in corneal endothelium after **primary** and secondary **intraocular lens** implantations in children.

1. Kim MJ, Kim JH, Kim SJ, Yu YS.
Graefes Arch Clin Exp Ophthalmol. 2011 Dec 6. [Epub ahead of print]
PMID: 22143676 [PubMed - as supplied by publisher]
Related citations

Infant Aphakia Treatment Study: effects of persistent fetal vasculature on outcome at 1 year of age.

2. Morrison DG, Wilson ME, Trivedi RH, Lambert SR, Lynn MJ; Infant Aphakia Treatment Study Group.
J AAPOS. 2011 Oct;15(5):427-31.
PMID: 22108353 [PubMed - in process]
Related citations

Complications, adverse events, and additional **intraocular surgery** 1 year after **cataract surgery** in the infant Aphakia Treatment Study.

3. Plager DA, Lynn MJ, Buckley EG, Wilson ME, Lambert SR; Infant Aphakia Treatment Study Group.
Ophthalmology. 2011 Dec;118(12):2330-4. Epub 2011 Sep 16.
PMID: 21925737 [PubMed - indexed for MEDLINE]
Related citations

Title: Complications, adverse events, and additional intraocular surgery 1 year after cataract surgery in the infant Aphakia Treatment Study.

- **Author**
  - Plager DA, Lynn MJ, Buckley EG, Wilson ME, Lambert SR; Infant Aphakia Treatment Study Group.
- **PURPOSE:**
  - To compare rates and severity of complications between infants undergoing cataract surgery with and without intraocular lens (IOL) implantation.
- **DESIGN:**
  - Prospective, randomized clinical trial.
- **PARTICIPANTS:**
  - The Infant Aphakia Treatment Study (IATS) is a randomized, multicenter (n = 12) clinical trial comparing treatment of aphakia with a primary IOL or contact lens in 114 infants with unilateral congenital cataract.

Ophthalmology. 2011 Dec;118(12):2330-4. Epub 2011 Sep 16.

- **INTERVENTION:**
- Infants underwent cataract surgery with or without placement of an IOL.
- **MAIN OUTCOME MEASURES:**
- The rate, character, and severity of intraoperative complications (ICs), adverse events (AEs), and additional intraocular surgeries (AISs) during the first postoperative year in the 2 groups were analyzed.
- **RESULTS:**
- There were more patients with ICs (28% vs. 11%; P = 0.031), AEs (77% vs. 25%; P<0.0001), and AISs (63% vs. 12%; P<0.0001) in the IOL group than the contact lens group. Iris prolapse was the most common IC. The most common AE was visual axis opacification, and the most common additional intraocular reoperation was a clearing of visual axis opacification.
- **CONCLUSIONS:**
- The rates of ICs, AEs, and AISs 1 year after surgery were numerically higher in the IOL group, but their functional impact does not clearly favor either treatment group.

將**STUDIES**的搜尋結果應用到我病人身上

- 此篇Paper的樣本接近我的病人，都是congenital cataract接受cataract surgery，且病人的年紀在一個月大到六個月大，randomised接受with or without primary IOL implantation的cataract surgery去追蹤一年，比較一年後的Visual acuity及intraoperative complication，adverse events和additional intraocular surgeries
- 結果顯示primary置入IOL的病人，其Visual outcome和另外不裝IOL的病人差不多，但是術後一年的intraoperative complication，adverse events和additional intraocular surgeries都比另一組病人來的高
- 應用到我的病人，根據此篇paper的結果顯示，對於小於六個月的病人，應該是先不裝入IOL其出現副作用的機率比較低，而且對於visual outcome也無影響。

Appraisal

Step 1：AAMPICOT將文獻分析

證據等級

Level	與[治療/預防/病因/危害]有關的文獻
1a	用多篇RCT所做成的綜合性分析(SR of RCTs)
1b	單篇RCT(有較窄的信賴區間)
1c	All or none
2a	用多篇世代研究所做成的綜合性分析
2b	單篇cohort及低品質的RCT
2c	Outcome research / ecological studies
3a	SR of case-control studies
3b	Individual case-control studies
4	Case-series(poor quality :cohort / case-control studies)
5	沒有經過完整評讀醫學文獻的專家意見

Grades of Recommendation

A	consistent level 1 studies
B	consistent level 2 or 3 studies ***or*** extrapolations from level 1 studies
C	level 4 studies or extrapolations from level 2 or 3 studies
D	level 5 evidence ***or*** troublingly inconsistent or inconclusive studies of any level

AAMPICOT MODEL

Item	AAMPICOT for therapy- Criteria	Comments(評論並說明你的根據)
Answer	此文獻有沒有回答我的問題	有
Authors	作者群是這領域的專家嗎？	是
	有沒有利益衝突？	The author(s) have no proprietary or commercial interest in any materials discussed in this article
Method	本文獻研究設計是屬於以下那一類 SR, RCT, Cohort, Case-contro, Case series or report, Expert opinion	RCT

Population	取樣是否為隨機取樣？	是
	取的樣本是否具代表性？其特性是否接近我的病人？	是
	分組是否是隨機分組？	是,114個病人, randomised將病人分成57個treat with IOL,57個with contact lens
	分組是否採用盲法？	否, 開刀時的主刀醫師知道病人是否放置IOL
Intervention	給予實驗組的處置是否描述清楚，並且是臨床可行的？	是

Comparison	給予對照組的處置是否描述清楚，並且是臨床可行的？各種可能比較皆有了？	是
Outcome	測量了那些結果？是否用客觀的方式測量？	Visual acuity with Teller acuity cards；rates of ICs,AE,AIS
	這些結果是否有統計學上的重要性？	是
	這些結果是否有臨床上的重要性？	是
Time	測量結果的時間點是否合宜？	是
	追蹤時間是否夠長？	不夠, 目前僅一年的追蹤時間
	文獻發表時間？	2011年12月

Appraisal

Step 2：使用worksheet進一步評讀文獻

Treatment Worksheet

THERAPY APPRAISAL GUIDE	COMMENTS
I Are the Results Valid?	
1. Was the assignment of patients to treatments randomized?	Yes
2. Were all patients who entered the trial properly accounted for and attributed at its conclusion? a)Was follow-up complete? b)Were patients analyzed in the groups to which they were randomized?	a) Yes, no patient loss follow up in 1 year b) Yes
3. Were patients, clinicians, and study personnel “blind” to treatment?	No
4. Were the groups similar at the start of the trial?	Yes
5. Aside from the experimental intervention, were the groups treated equally?	Yes

II What Are the Results?	
1. How large was the treatment effect?	Not sure
2. How precise is the estimate of the treatment effect?	Not sure
III Will the Results Help Me in My Patient Care?	
1. Can the results be applied to my patients?	Yes
2. Were all clinically important outcomes considered?	Yes
3. Are the benefits worth the harms and costs?	Yes

APPLY

結合醫學倫理方法

將**study**的結果應用在病人身上

醫療現況	病人意願
目前對於Congenital cataract的病人接受Cataract surgery,是否有裝置人工水晶體健保皆有給付，但是Contact lens則沒有給付	病人通常爲嬰兒或是年紀小的小孩，屬於無行爲能力無法決定
生活品質	社會脈絡
若是使用Contact lens,需每天換Contact lens且有corneal infection的危險，另外花費也較多，生活品質相對上較差	若能夠直接放入IOL而不用天天換Contact lens,則家屬的負擔也相對較小

總結與討論

- 在目前的paper來看，對於一到六個月大Congenital cataract的病人接受cataract surgery，是否同時放置人工水晶體在一年的追蹤期內並不會影響visual outcome，但是對於同時放置人工水晶體的病人，其術中的併發症，術後的一些併發症及需要再次手術的機率都比不放置人工水晶體的病人來個高，因次應用到我的病人，為三個月大Congenital cataract的病人，應該先選擇不放入人工水晶體

Audit（自我評估）

在「提出臨床問題」方面的自我評估

- 我提出的問題是否具有臨床重要性？有
- 我是否明確的陳述了我的問題？
  - 我的foreground question 是否可以清楚的寫成PICO？可以
  - 我的background question是否包括what, when, how, who等字根？有
- 我是否清楚的知道自己問題的定位？（亦即可以定位自己的問題是屬於診斷上的、治療上的、預後上的或流行病學上的），並據以提出問題？知道
- 對於無法立刻回答的問題，我是否有任何方式將問題紀錄起來以備將來有空時再找答案？有

在「搜尋最佳證據」方面的自我評估

- 我是否已盡全力搜尋？是
- 我是否知道我的問題的最佳證據來源？知道
- 我是否從大量的資料庫來搜尋答案？是
- 我工作環境的軟硬體設備是否能支援我在遇到問題時進行立即的搜尋？可以
- 我是否在搜尋上愈來愈熟練了？仍需努力
- 我會使用「斷字」、布林邏輯、同義詞、MeSH term，限制 (limiters)等方法來搜尋？大致上會
- 我的搜尋比起圖書館人員或其他對於提供病人最新最好醫療有熱情的同事如何？希望能積極趕上

關於「嚴格評讀文獻」方面的自我評估

- 我是否盡全力做評讀了？有
- 我是否了解Number need to treat 的意義？了解
- 我是否了解Likelihood Ratios的意義？大致了解
- 我是否了解worksheet每一項的意義？大致了解
- 評讀後，我是否做出了結論？是

關於「應用到病人身上」的自我評估

- 我是否將搜尋到的最佳證據應用到我的臨床工作中？是
- 我是否能將搜尋到的結論如NNT,LR用病人聽得懂的方式解釋給病人聽？盡量努力
- 當搜尋到的最佳證據與實際臨床作為不同時，我如何解釋？查到的證據不一定跟本身的case相同,仍以臨床判斷為主

改變「醫療行為」的自我評估

- 當最佳證據顯示目前臨床策略需改變時，我是否遭遇任何阻止改變的阻力？目前沒有
- 我是否因此搜尋結果而改變了原來的治療策略？做了那些改變？目前沒有

效率評估

- 這篇報告，我總共花了多少時間？8 hrs
- 我是否覺得這個進行實證醫學的過程是值得的？是
- 我還有那些問題或建議？對於統計方式仍有疑問

Thank you for your attention!