Evidence Based Medicine journal club

報告時間：2012.02

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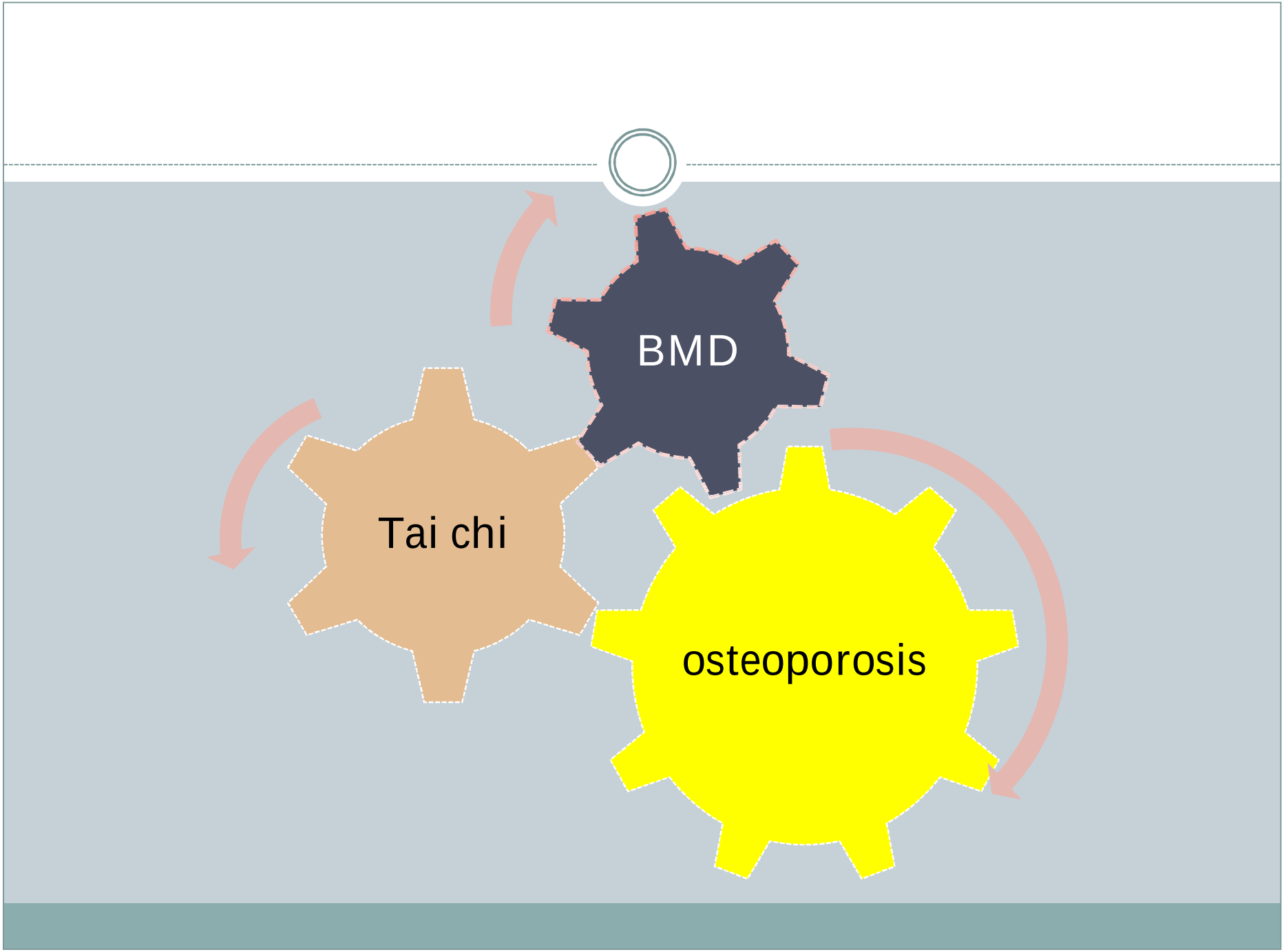
指導醫師：顏宏融醫師
葉柏巖醫師


BMD
Tai chi
osteoporosis

Case scenario

- A 55 y/o female
- Menopause three years
- No previous fractures or risk factors except low weight
- Calcium 1200 mg, vitamin D 1000 IU daily

BND
T score at L-spine=-2.2

Diagnosis: low bone mass

Orthopaedist suggestion：

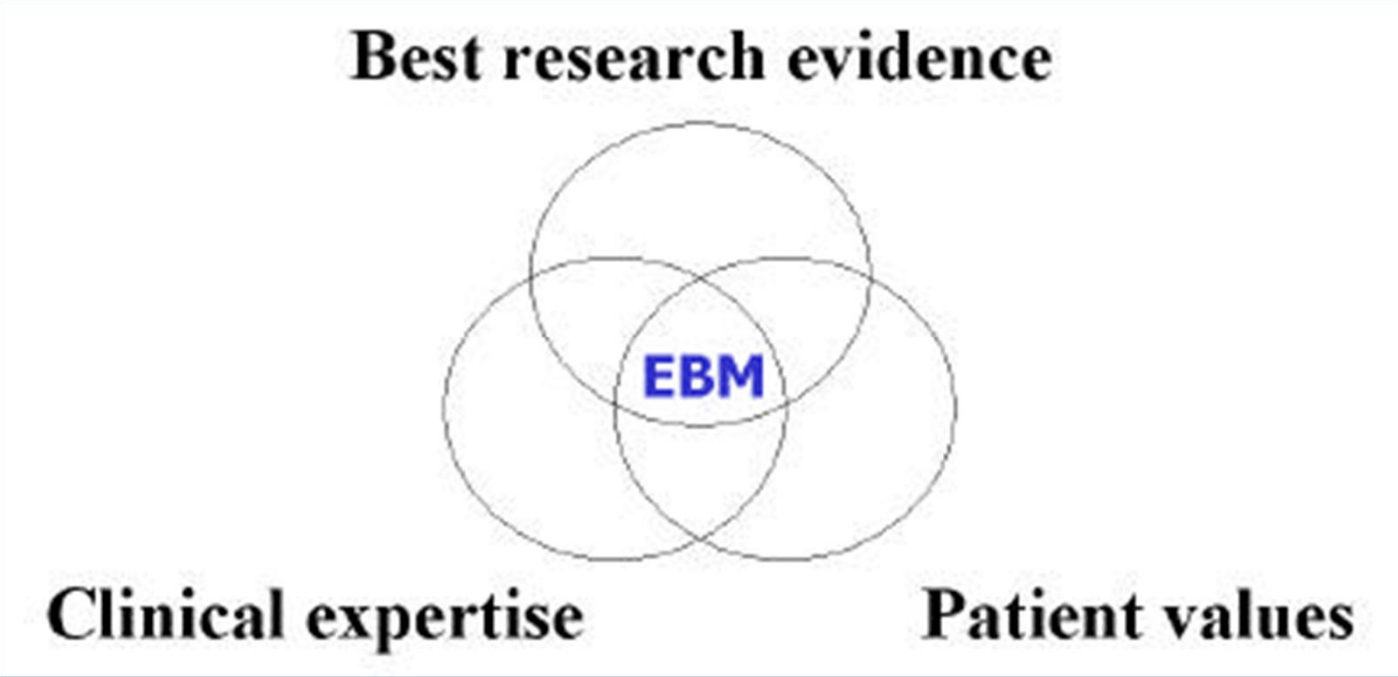
- Start long-term therapy to reduce bone loss and prevent fracture.
- Take regular exercise

Patient's questions:

- Should I take the medicine?
- Any other treatment can improve my condition?
- I heard tai chi can treatment osteoporosis,

How should you answer these questions?

EBM Decision Making



EBM is the process begins and ends with patients !!!!

Step 1

Ask an answerable question

問一個可以回答的問題

Background questions

- Ask for general knowledge about a disorder
- Components:
  A question root (who, what, where, when, how, why)
  What is the disorder ?
  What causes it ?
  How does it present ?
  What are some treatment options ?
- Background resources: textbooks, narrative reviews in journals (Online Harrison, UpToDate)
- Answering only background questions is insufficient to help getting the best available care to our patients

Foreground questions

- Ask for specific knowledge about managing patients with a disorder
- Four (or three): PICO

  Patient and/or problem

  Intervention (exposure, test)

  Comparison intervention (if relevant)

  Outcomes

Formulate A PICO Question

P	Patient or problem	Describes patient (age, sex, race, past medical history, Etc)
I	Intervention	What happens or is to be done; treatment, diagnostic test, exposure, screening
C	Comparison	Compared to what? Placebo Nothing, placebo, gold standard, another intervention
O	Outcomes	What is the effect of the intervention?

Determining question type

- Therapy

  Determining the effect of different treatments on improving patient function or avoiding adverse events

- Harm

  Ascertaining the effects of potentially harmful agents (including the vary therapies we would be interested) on patient function, morbidity, and mortality

- Diagnosis (tests)

  Establishing the power of an intervention to differentiate between those with & without a target condition of disease

- Prognosis

  Estimating the future course of a patient's disease

Case scenario

- A 55 y/o female
- Menopause five years
- Complained low back soreness、
- No previous fractures or risk factors except low weight
- BND：T score at L-spine=-2.2
- Diagnosis: low bone mass

P.I.C.O.

- P (patient):

  Patient of postmenopausal women
- I (intervention):

  Tai chi
- C (comparison):

  Sedentary life, other treatments
- O (outcome):

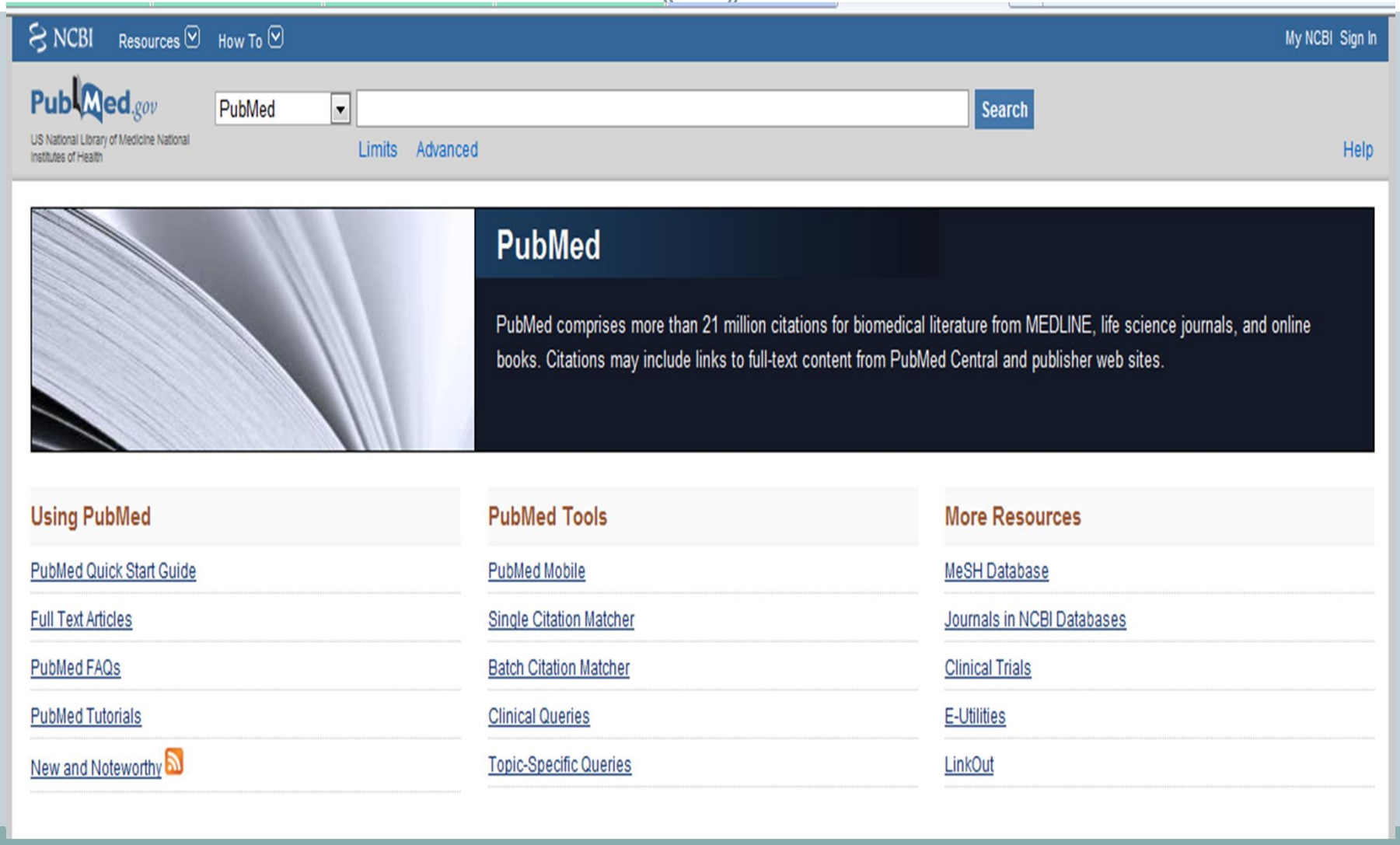
  Bone mineral desity(BMD)

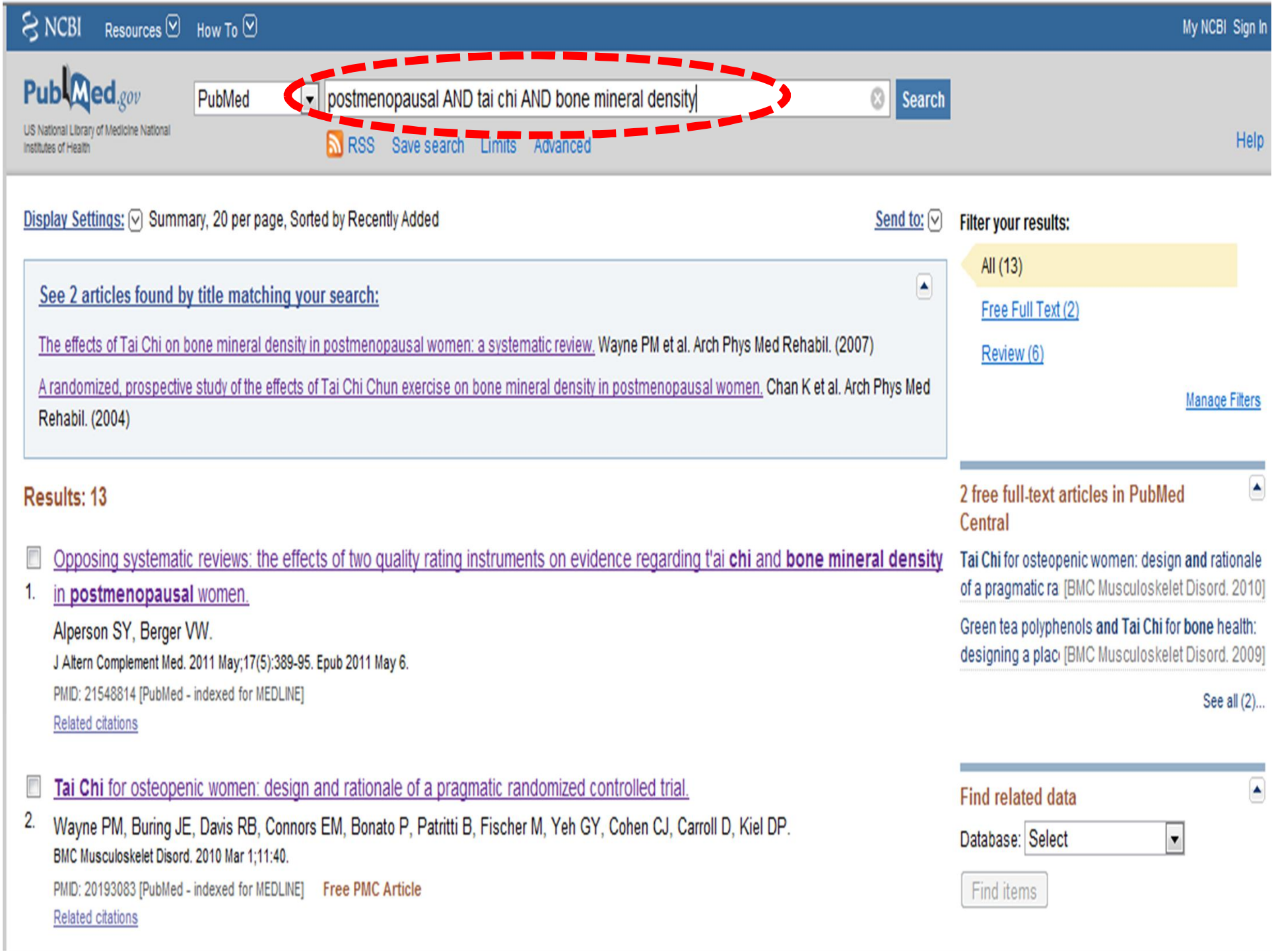
Step 2

Searching for the best available evidence

尋找有力的醫學證據

Search strategy : PudMed

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The effects of Tai Chi on bone mineral density in postmenopausal women: a systematic review. Wayne PM et al. Arch Phys Med Rehabil. (2007)
A randomized, prospective study of the effects of Tai Chi Chun exercise on bone mineral density in postmenopausal women. Chan K et al. Arch Phys Med Rehabil. (2004)
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J Altern Complement Med. 2011 May;17(5):389-95. Epub 2011 May 6.
PMID: 21548814 [PubMed - indexed for MEDLINE]
Related citations
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BMC Musculoskelet Disord. 2010 Mar 1;11:40.
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2. Shen CL, Chyu MC, Yeh JK, Felton CK, Xu KT, Pence BC, Wang JS.
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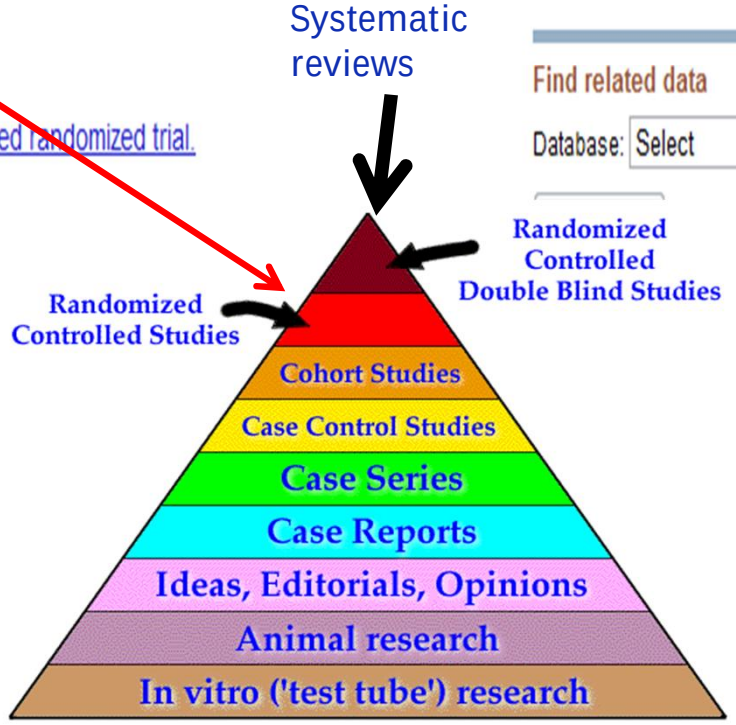

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Effectiveness of exercise in the treatment of lumbar spinal stenosis, knee osteoarthritis, and osteoporosis.

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Aging Clin Exp Res. 2010 Apr;22(2):116-22. Epub 2009 Nov 6. Review.
PMID: 19920410 [PubMed - indexed for MEDLINE]
Related citations

The role of physical activity in the prevention of osteoporosis in **postmenopausal** women-An update.

2. Schmitt NM, Schmitt J, Dören M.
Maturitas. 2009 May 20;63(1):34-8. Epub 2009 Apr 7. Review.
PMID: 19356867 [PubMed - indexed for MEDLINE]
Related citations

Tai Chi Chuan exercises in enhancing **bone mineral density** in active seniors.

3. Lui PP, Qin L, Chan KM.
Clin Sports Med. 2008 Jan;27(1):75-86, viii. Review.
PMID: 18206569 [PubMed - indexed for MEDLINE]
Related citations

Tai chi for osteoporosis: a systematic review.

4. Lee MS, Pittler MH, Shin BC, Ernst E.
Osteoporos Int. 2008 Feb;19(2):139-46. Epub 2007 Oct 23. Review.
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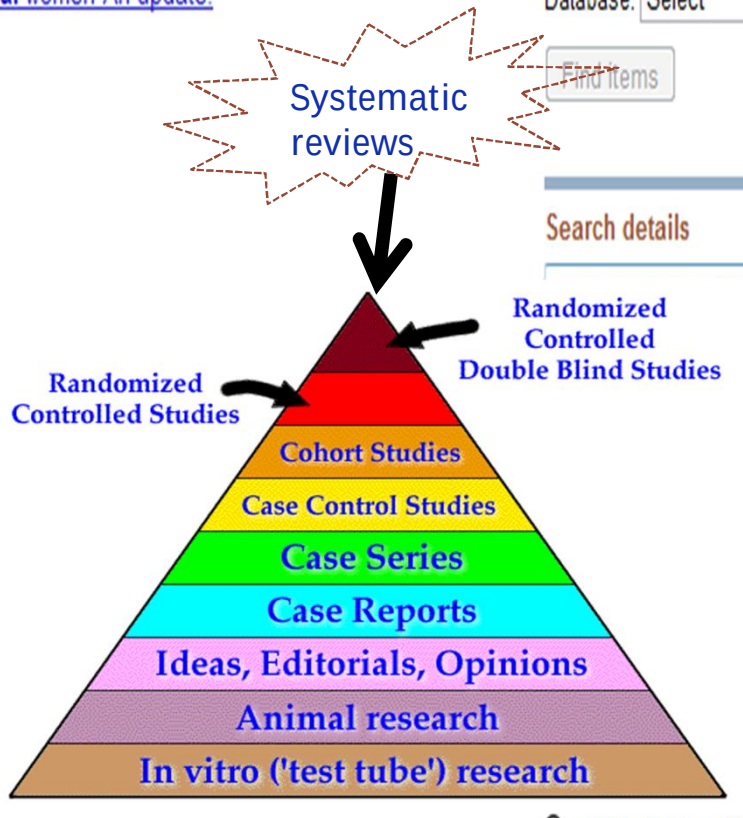

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5. Wayne PM, Kiel DP, Krabs DE, Davis RB, Savetsky-German J, Connelly M, Buring JE.

Arch Phys Med Rehabil. 2007 May;88(5):673-80. Review.

PMID: 17466739 [PubMed - indexed for MEDLINE]

Related citations

Osteoporosis: current modes of prevention and treatment.

6. Lane JM, Nydick M.

J Am Acad Orthop Surg. 1999 Jan;7(1):19-31. Review.

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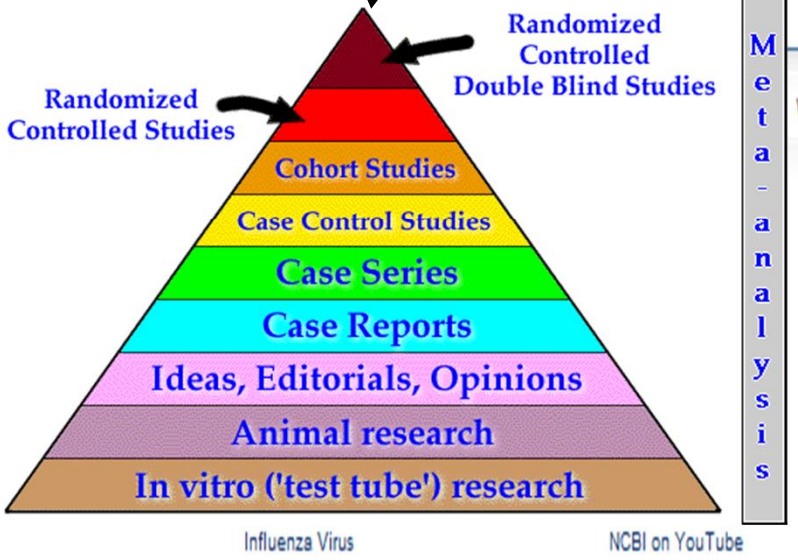

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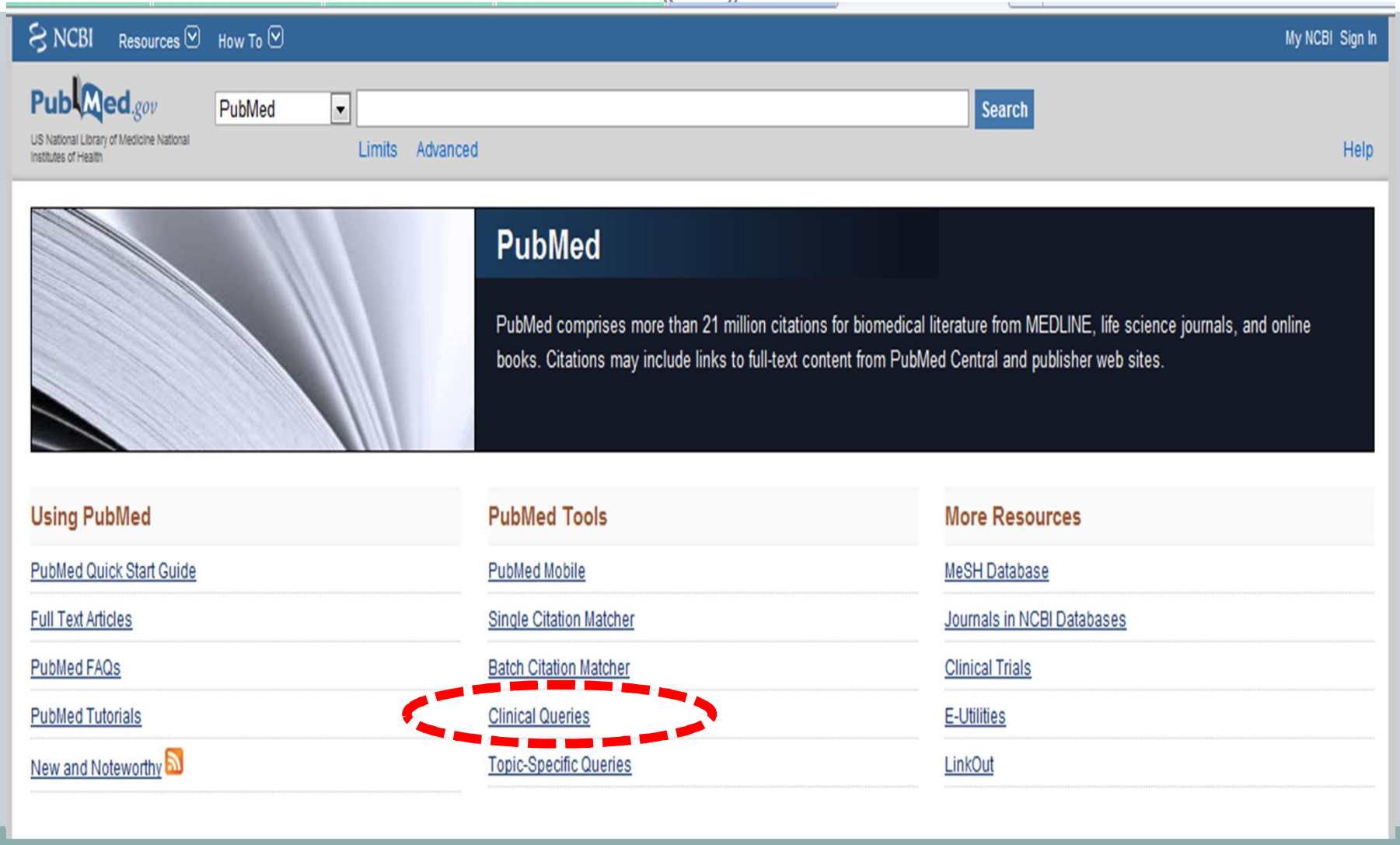

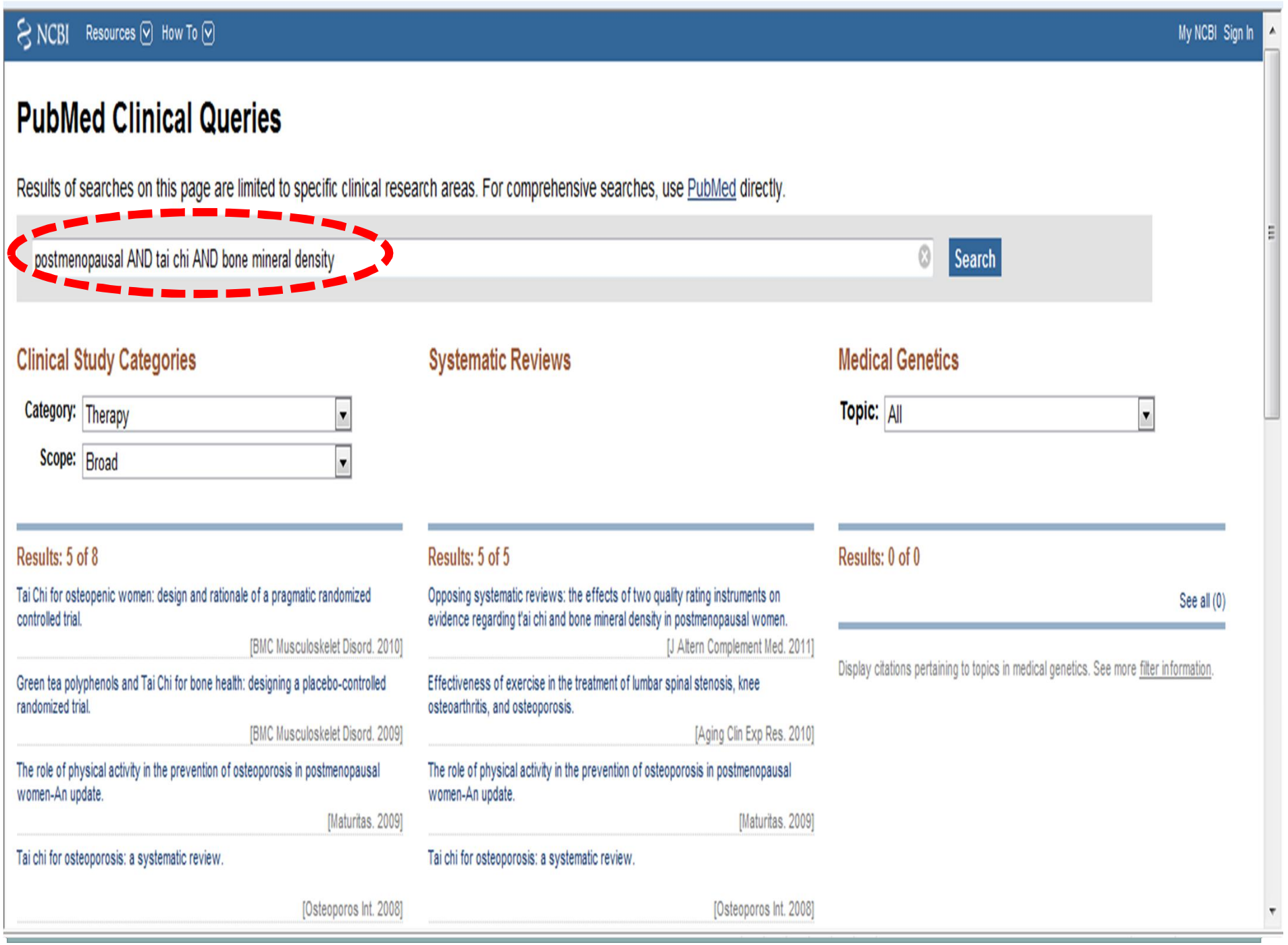
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Tai Chi for osteopenic women: design and rationale of a pragmatic randomized controlled trial.
[BMC Musculoskelet Disord. 2010]
Green tea polyphenols and Tai Chi for bone health: designing a placebo-controlled randomized trial.
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[Maturitas. 2009]
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[Osteoporos Int. 2008]
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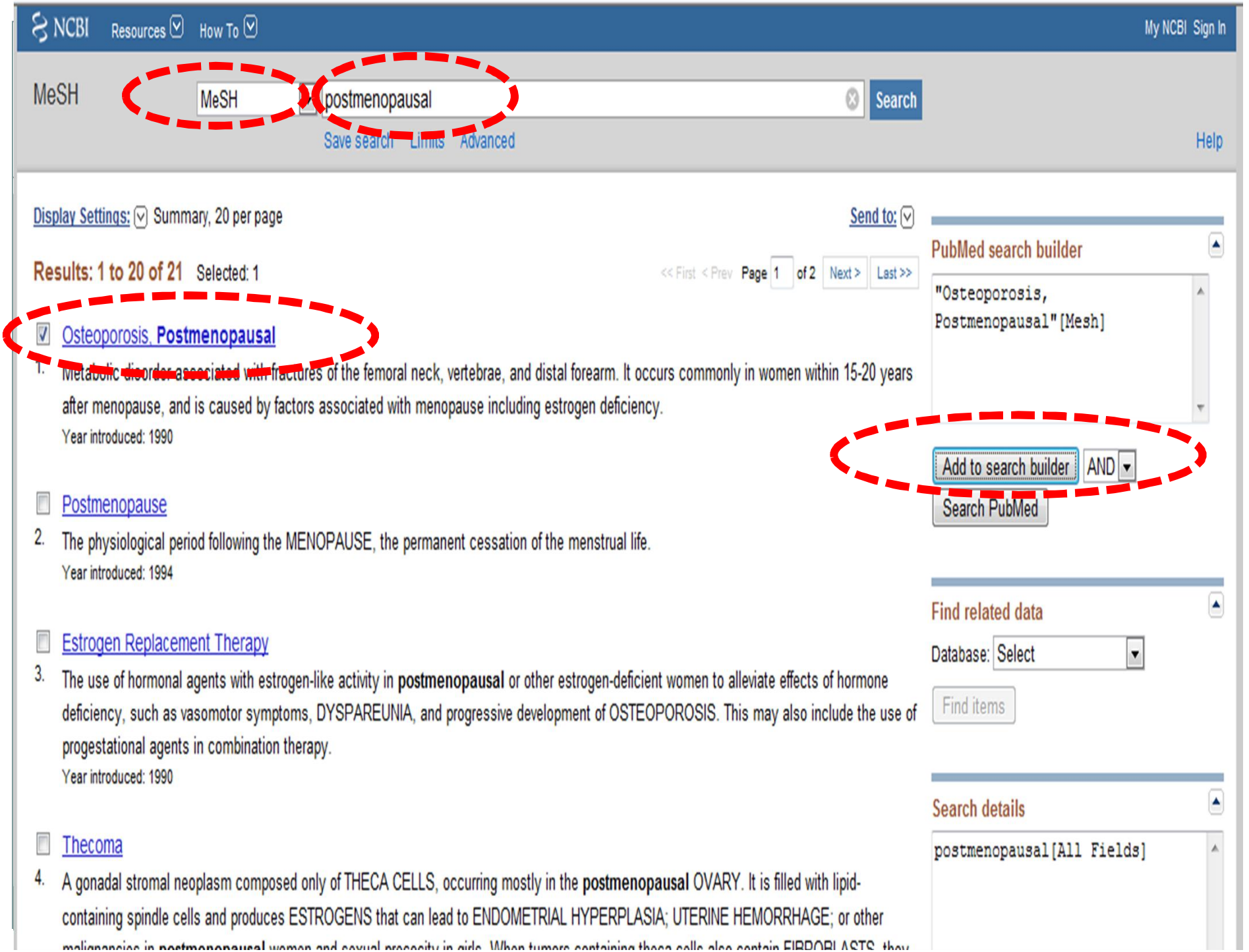
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Osteoporosis, Postmenopausal
1. Metabolic disorder associated with fractures of the femoral neck, vertebrae, and distal forearm. It occurs commonly in women within 15-20 years after menopause, and is caused by factors associated with menopause including estrogen deficiency.
Year introduced: 1990
Postmenopause
2. The physiological period following the MENOPAUSE, the permanent cessation of the menstrual life.
Year introduced: 1994
Estrogen Replacement Therapy
3. The use of hormonal agents with estrogen-like activity in postmenopausal or other estrogen-deficient women to alleviate effects of hormone deficiency, such as vasomotor symptoms, DYSPAREUNIA, and progressive development of OSTEOPOROSIS. This may also include the use of progestational agents in combination therapy.
Year introduced: 1990
Thecoma
4. A gonadal stromal neoplasm composed only of THECA CELLS, occurring mostly in the postmenopausal OVARY. It is filled with lipid-containing spindle cells and produces ESTROGENS that can lead to ENDOMETRIAL HYPERPLASIA; UTERINE HEMORRHAGE; or other
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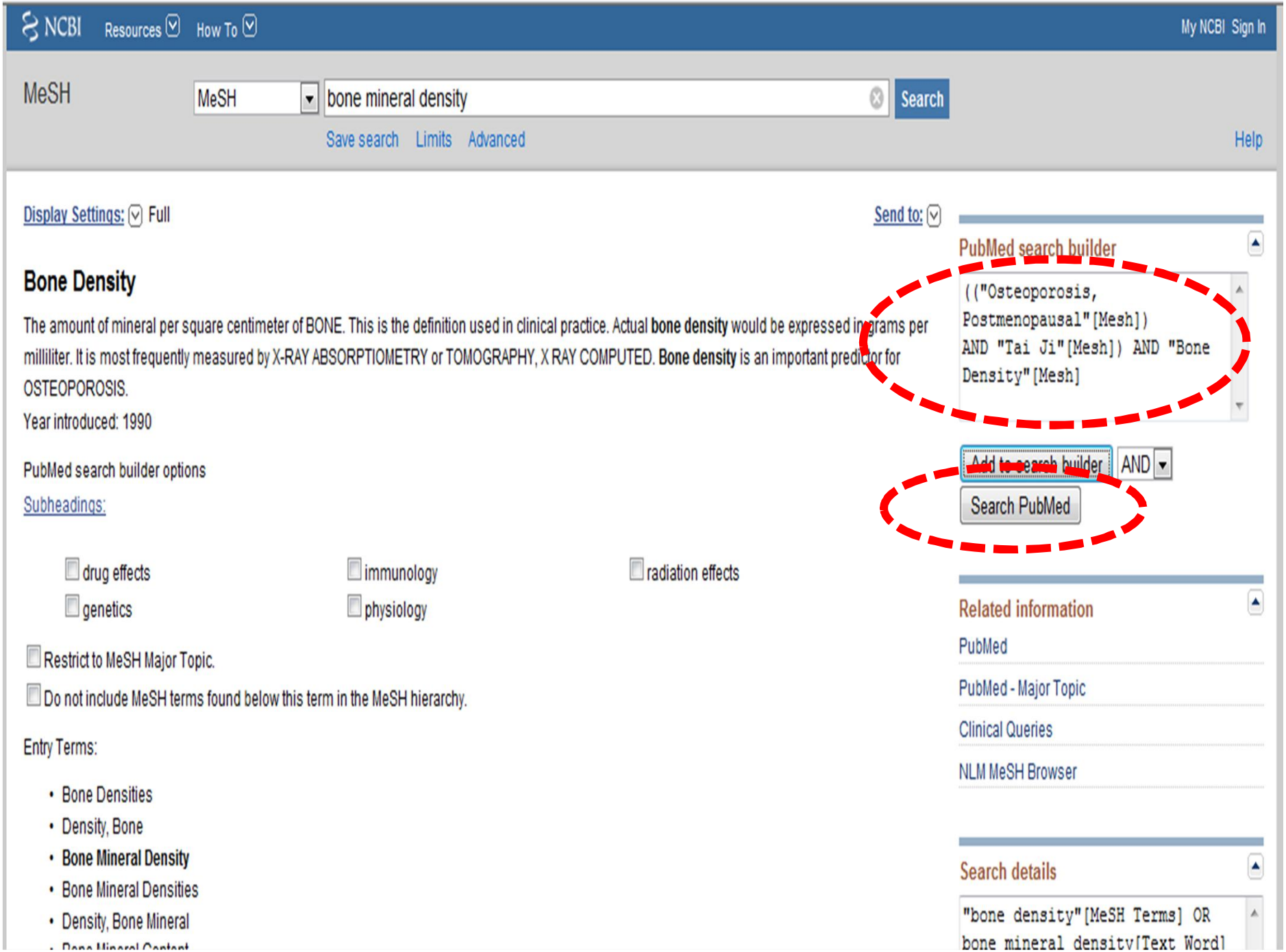
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Bone Density
The amount of mineral per square centimeter of BONE. This is the definition used in clinical practice. Actual bone density would be expressed in grams per milliliter. It is most frequently measured by X-RAY ABSORPTIOMETRY or TOMOGRAPHY, X RAY COMPUTED. Bone density is an important predictor for OSTEOPOROSIS.
Year introduced: 1990
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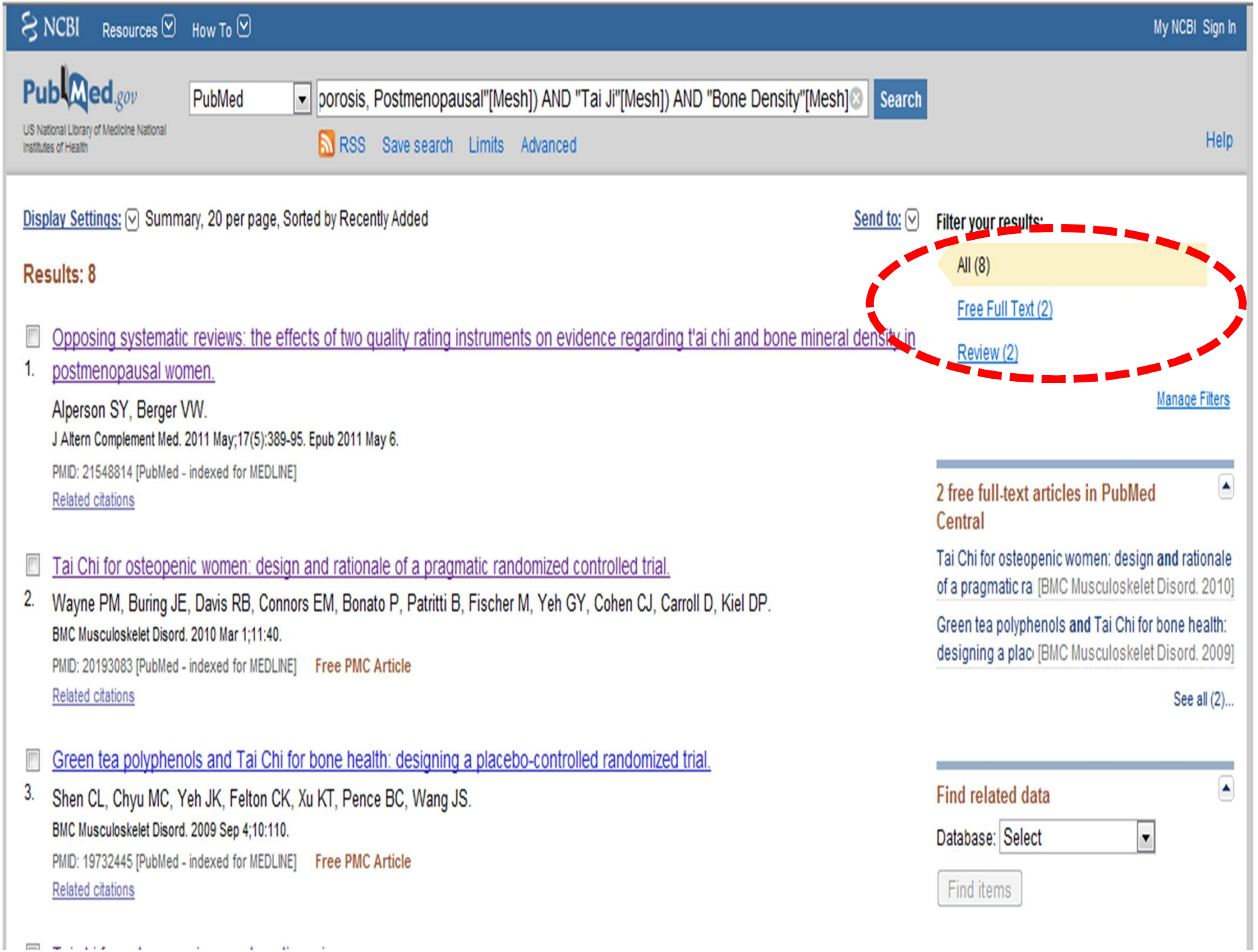
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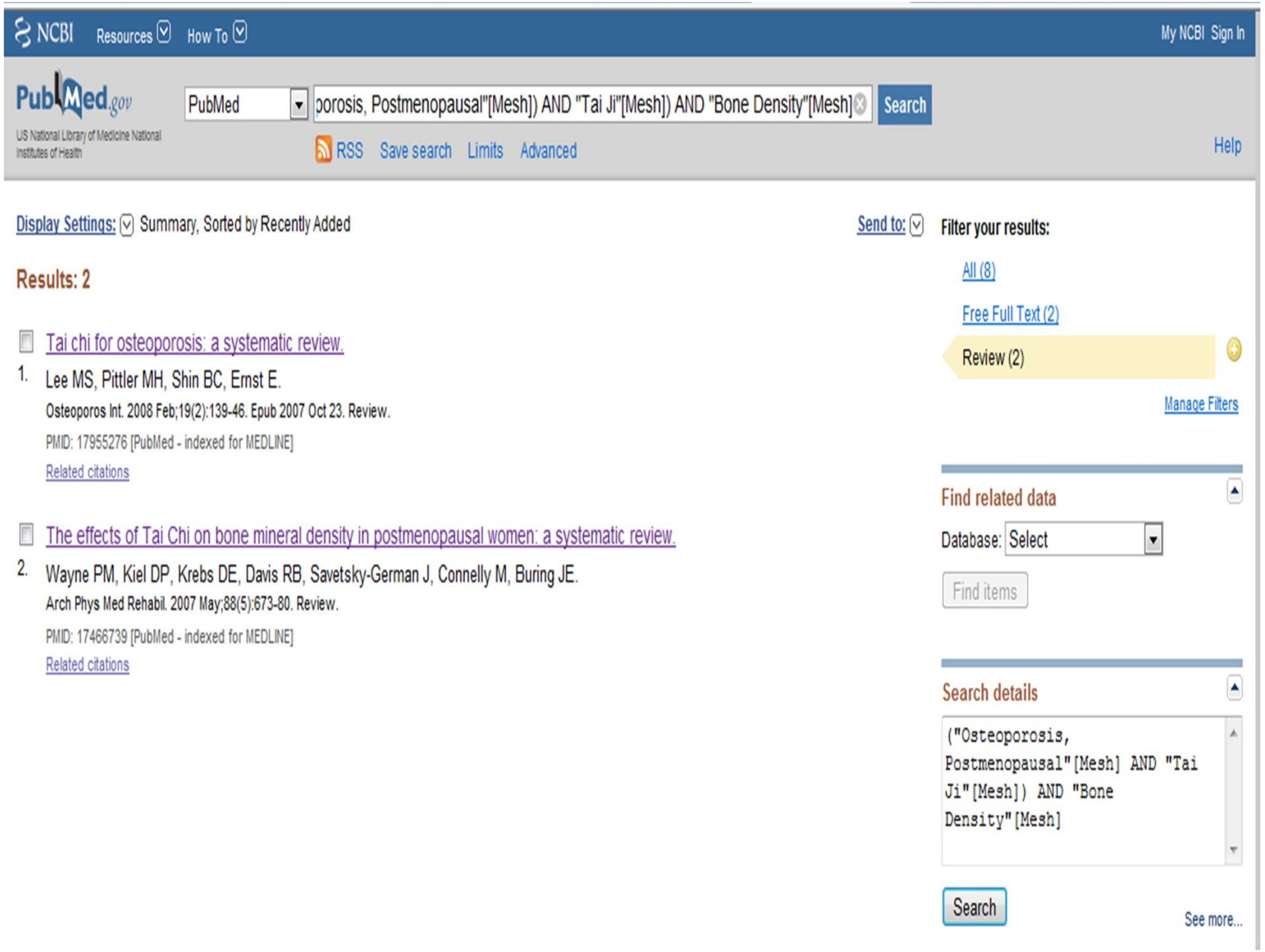
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Archives of Physical Medicine and Rehabilitation

Volume 88, Issue 5, May 2007, Pages 673–680

Review article

The Effects of Tai Chi on Bone Mineral Density in Postmenopausal Women: A Systematic Review

Peter M. Wayne, PhD[a, d], Douglas P. Kiel[b], David E. Krebs, PhD[c], Roger B. Davis, ScD[d], Jacqueline Savetsky-German, MPH, MAOM[a], Maureen Connelly, MD[d], Julie E. Buring, ScD[d]

[a] New England School of Acupuncture, Watertown, MA

[b] Institute for Aging Research, Hebrew SeniorLife, Boston, MA

[c] MGH Institute of Health Professions, Massachusetts General Hospital, Boston, MA

[d] Osher Institute, Harvard Medical School, Boston, MA

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Step 3

Critical appraisal

文獻評讀

Critical Appraisal of Systematic Review

- Are the results of the review valid (效度如何)?
  – What question did the systematic review addressed (回答什麼問題)?
  – Is it unlikely that important, relevant studies were missed (沒有遺漏重要的文獻)?
  – Were the criteria used to select articles for inclusion appropriate(選擇文獻的準則適當)?
  – 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)?
  – Were the results similar from study to study (各研究的結果相似)?
- What were the results (結果為何)?
  – How are the results presented (結果如何呈現)?

What question did the systematic review addressed (PICO)?

想要回答什麼問題?

Objective: To evaluate the evidence for Tai Chi as an intervention to reduce rate of bone loss in postmenopausal women.

This review examines the use of Tai Chi as a potential intervention for postmenopausal women with low BMD. We begin by

P：postmenopausal
I ：tai chi
O：BMD

Is it unlikely that important, relevant studies were missed?

沒有遺漏重要的文獻？

METHODS

Clinical Trials Examining Tai Chi's Effect on BMD in Postmenopausal Women

data sources

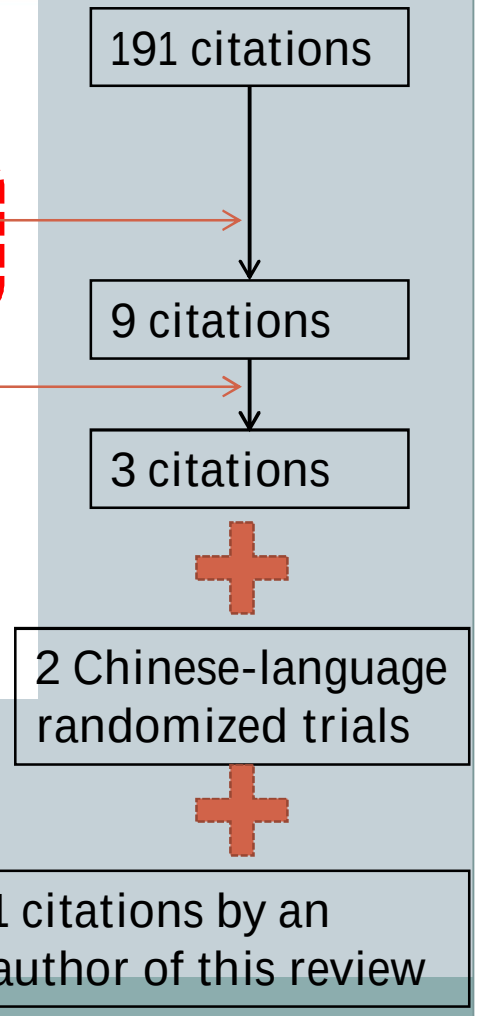
To systematically review the evidence evaluating Tai Chi for reducing rates of postmenopausal BMD loss, we conducted a literature search using Medline, Science Citation Index, and Cochrane Database of Randomized Controlled Trials. Search strategies for each of these databases included using the following statements and key words: *Tai Chi* or *Tai Chi Chuan* or *Taijiquan* and *bone* or *osteoporosis* or *menopause*, and included the period 1966 through April 2006. We also conducted a separate literature search using China Biological Medicine Database for Chinese-language randomized trials using the key words *Taijiquan*, *bone*, and *osteoporosis*. Finally, we manually searched the bibliographies of retrieved articles and our personal libraries for additional relevant citations.

Were the criteria used to select articles for inclusion appropriate?

選擇文獻的準則適當?

Study Selection: Randomized controlled trials (RCTs), prospective cohort studies, and cross-sectional studies that included Tai Chi as an intervention, and had at least 1 outcome related to measurement of bone mineral density (BMD).

Our database searches of Medline, Science Citation Index, and Cochrane identified a total of 191 citations. Titles and abstracts of these citations were manually reviewed and considered eligible only if they described a prospective or cross-sectional study that employed Tai Chi as an intervention, and had at least 1 outcome related to measurement of BMD. A total of 9 citations met these criteria. Six of these 9 citations were limited to abstracts of proceedings from scientific meetings and were thus excluded; the remaining 3 were included in this review. Two additional eligible citations were identified using the China Biological Medicine Database for Chinese-language randomized trials, and 1 was identified in the personal library of an author of this review.



6 controlled studies were identified. There were 2 RCTs,
2 nonrandomized prospective parallel cohort studies, and
2 cross-sectional studies.

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?

Results across the 6 studies summarized in table 2 suggest the following: First, long-term postmenopausal Tai Chi practitioners have higher BMD than age-matched sedentary controls, and have slower rates of bone loss. In 1 cross-

Second, Tai Chi-naive women who undergo Tai Chi training exhibit reduced rates of postmenopausal BMD decline.

Third, 1 nonrandomized cross-over study[71] provided qualitative data suggesting that Tai Chi improves perimenopausal symptoms including hot flashes and abdominal distention.

Finally, Tai Chi appears to be safe for peri- and postmenopausal women. No significant adverse effects were reported in any of the 6 studies evaluated.

Were the results similar from study to study?

各研究的結果相似?

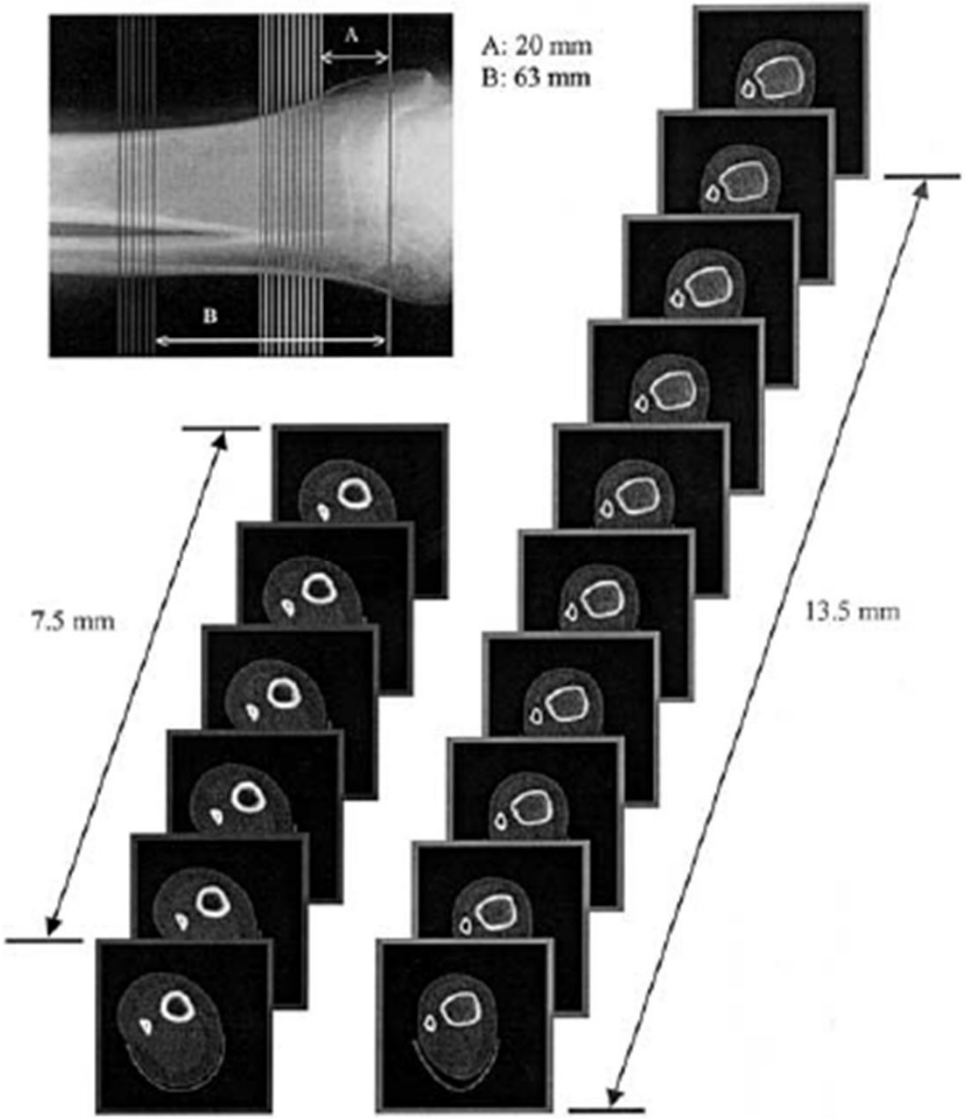
Table 2: Summary of Studies Evaluating Impact of Tai Chi on BMD in Peri- and Postmenopausal Women

Study	Study Design (Duration)	Study Location (Language)	Study Population (Age)	Interventions and Sample Size	Outcomes Measured	Results
Qin et al[70]	Prospective cohort (12mo)	Hong Kong (English)	Postmenopausal community-dwelling women (54±3.4y)	• Long-term Tai Chi practitioners (min 4y experience) (n=17) • Age- and sex-matched sedentary controls (n=17)	BMD of lumbar spine and proximal femur (w/DXA), and distal tibia (w/pQCT)	Significantly greater BMD in lumbar spine, proximal femur, and tibia in Tai Chi vs control. Reduced rates of BMD loss in Tai Chi, but trend significant only w/pQCT
Gong et al[72]	Cross-sectional	Shanghai, PRC (Chinese)	Community-dwelling men and women (67.0±1.3y)	• Long-term Tai Chi practitioners (min 5y experience) (n=28) • Age-matched sedentary controls (n=32)	BMD of lumbar spine and proximal femur (w/DXA)	BMD significantly greater in L1 through L4 and femur for Tai Chi vs control. 5–10y experience not different from 10+
Chan et al[68]	RCT (12mo)	Hong Kong (English)	Postmenopausal community-dwelling women (54.0±3.5y)	• Tai Chi: 5 sessions/wk, 45min (n=67) • Sedentary control (n=65)	BMD of lumbar spine and proximal femur (w/DXA), and of distal tibia using (w/pQCT)	Reduced rate of tibial bone loss in Tai Chi group (pQCT); nonsignificant trends in reduced rates of bone loss w/DXA
Zhou[69]	RCT (10mo)	Shanxi, PRC (Chinese)	Postmenopausal school teachers (55.9±2.8y)	• 5 groups: • Rope skipping (n=12) • Mulan boxing (n=12) • Tai Chi solo form (n=12) • Tai Chi push hands (n=12) • Sedentary control (n=12)	BMD of L2-4, distal radius and ulna (w/ DXA)	BMD decreased in nonexercise control and increased in all exercise groups Tai Chi pushing hands significantly higher increases in BMD
Xu et al[71]	Paired crossover design (8mo)	Melbourne Australia (English)	Menopausal women (49.3y)	• Tai Chi (n=12) • Acupuncture (n=14) • Chinese herbs (n=14) Half of each cohort initially allocated to sedentary control; then crossed over at 16wk	Broadband ultrasound attenuation; bone formation marker (osteocalcin) Bone resorption markers (pyridinoline, deoxypyridinoline) TCM diagnoses	Tai Chi reduced rate of decline in broadband ultrasound attenuation; Tai Chi increased rate of bone formation (osteocalcin), but no effect on resorption; Tai Chi improved a number of menopausal symptoms according to TCM theory
Qin et al[73]	Cross-sectional	Hong Kong (English)	Postmenopausal community-dwelling women (55.5±3.1y)	• Long-term Tai Chi practitioners (min 3y experience) (n=48) • Age-matched sedentary controls (n=51)	BMD of lumbar spine and proximal femur (by DXA), quadriceps strength, flexibility, balance	Significantly greater BMD in lumbar spine and some regions of femur (greater trochanter, Ward's area) in Tai Chi vs control. Greater quad strength and balance in Tai Chi vs control

2 RCTs

Study	A randomized, prospective study of the effects of Tai Chi Chuan exercise on bone density in postmenopausal women	The effects of traditional sports on the bone density in postmen0pausal women
location	Hong Kong Arch Phys Med Rehabil 2004;85;717-22	Shanxi J Beijing Sport Univ 2004;27:354-60
Participant	Postmenopausal community-dwelling women	Postmenopausal school teachers
Interventions and Comparison	•12 months •Tai Chi：5 sessions/wk, 45min(n=67) •Sedentary control(n=65)	•10 months •Rope skipping(n=12) •Mulan boxing(n=12) •Tai Chi solo form(n=12) •Tai Chi push hands(n=12) •Sedentary control(n=12)
Outcome	Reduced rate of tibial bone loss in Tai Chi group ; nonsignificant trends in reduced rates of bone loss w/DXA	BMD decreased in nonexercise control and increased in all exercise groups Tai Chi pushing hands significantly higher increases in BMD

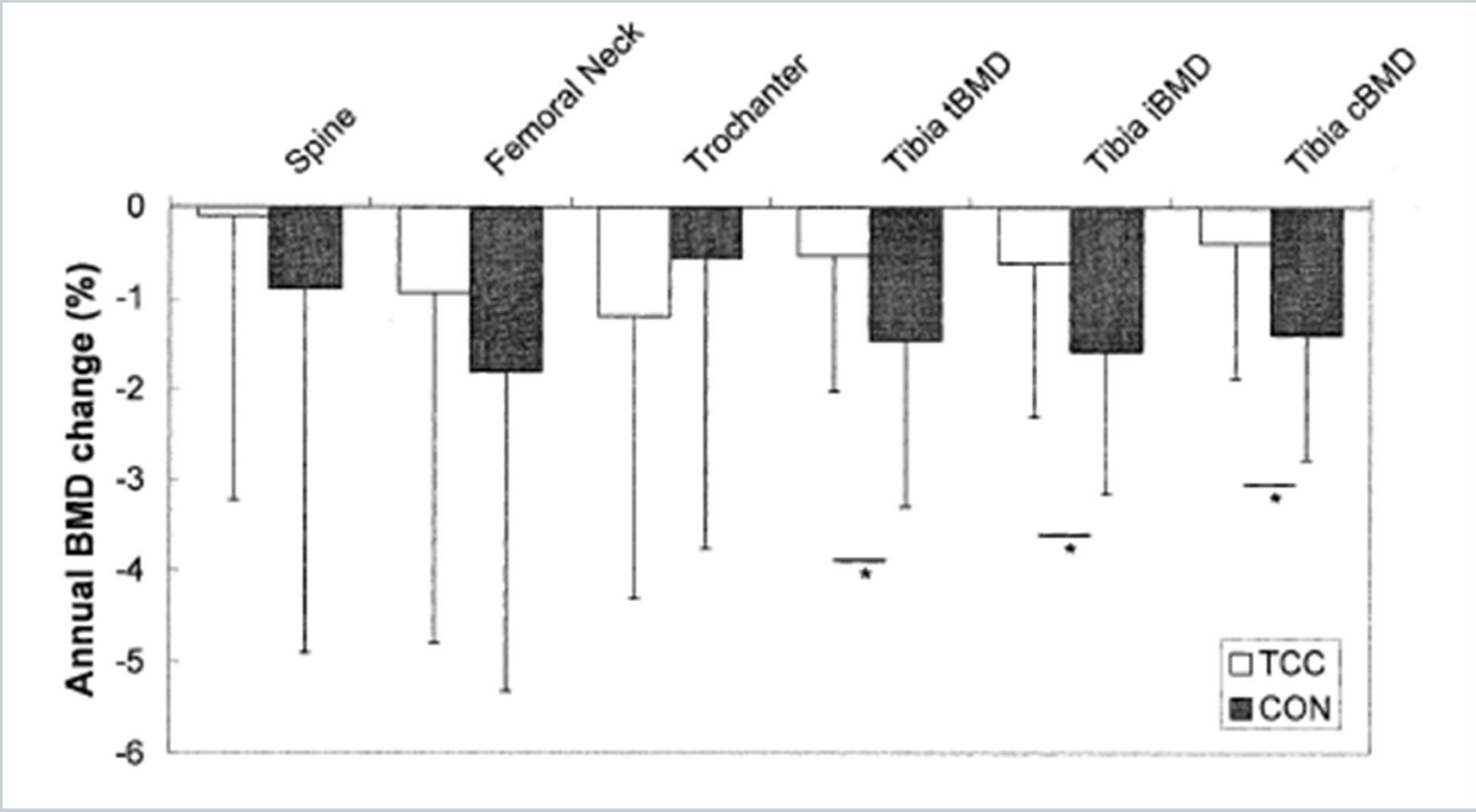
Sixteen standard tomographs from pQCT



A Randomized, Prospective Study of the Effects of Tai Chi Chun Exercise on Bone Mineral Density in Postmenopausal Women

Kaiming Chan, FRCS, Ling Qin, PhD, Mingchu Lau, MD, Jean Woo, MD, Szeki Au, MPhil, Wingyee Choy, BSc, Kwongman Lee, PhD, Shiuhung Lee, MD

Arch Phys Med Rehabil 2004;85:717-22.



2 cohort studies

Study	Regular Tai Chi Chuan exercise may retard bone loss in postmenopausal women：a case-control study	A study on Tai Ji exercise and traditional Chinese medical modalities in relation to bone structure, bone function and menopausal symptoms
location	Hong Kong Arch Phys Med Rehabil 2002;83;1355-9	Melbourne Australia J Chin Med 2004;74;3-7
Participant	Postmenopausal community-dwelling women	Menopausal women
Interventions and Comparison	•12 months •Long-term Tai Chi practitioners (min 4y experience)(n=17) •Age- and Sex-matched sedentary control(n=17)	•8 months •Tai Chi(n=12) •Acupuncture(n=14) •Chinese herb(n=14) Half of each cohort initially allocated to sedentary control；then crossed over at 16wk
Outcome	Significantly greater BMD in lumbar spine, proximal femur, and tibia in Tai Chi vs control.	Tai Chi increased rate of bone formation but no effect on resorption; Tai Chi improved a number of menopausal symptoms according to TCM theory

Regular Tai Chi Chuan Exercise May Retard Bone Loss in Postmenopausal Women: A Case-Control Study

Ling Qin, PhD, Szeki Au, MPhil, Wingyee Choy, BSc, Pingchung Leung, DSc, FRCS, Marus Neff, MD, Kwongman Lee, PhD, Mingchu Lau, MD, Jean Woo, MD, Kaiming Chan, FRCS

Arch Phys Med Rehabil 2002;83:1355-9.

Table 3: Differences in Areal and Volumetric BMD Between Exercisers and Controls at Baseline

			TCE Group (n=17)	CON Group (n=17)	Difference (%)	*P*
DXA	Spine	L2–4	.912±.152	.802±.095	13.7	.018*
(g/cm^2)		Neck	.787±.112	.715±.084	10.1	.041*
	Proximal femur	Intertrochanter	.632±.085	.571±.081	10.7	.041*
		Ward's triangle	.582±.093	.507±.088	14.8	.021*
pQCT	Ultradistal tibia	tBMD	232±49	204±26	13.7	.048*
(mg/cm^3)		iBMD	466±68	434±85	7.4	.231
	Distal tibial diaphysis	$cBMD_T$	1533±48	1540±67	0.5	.714
		$cBMD_O$	905±101	895±147	1.1	.812

Regular Tai Chi Chuan Exercise May Retard Bone Loss in Postmenopausal Women: A Case-Control Study

Ling Qin, PhD, Szeki Au, MPhil, Wingyee Choy, BSc, Pingchung Leung, DSc, FRCS, Marus Neff, MD, Kwongman Lee, PhD, Mingchu Lau, MD, Jean Woo, MD, Kaiming Chan, FRCS

Arch Phys Med Rehabil 2002;83:1355-9.

Table 1: Comparison of Areal and Volumetric BMD Between Exercisers and Controls at Baseline and at 12-Month Follow-Up

Measurement Region and Variables			TCE Group				CON Group				*P* (% difference between TCE/CON)
			Baseline	Follow-Up	Difference in %	*P*	Baseline	Follow-Up	Difference in %	*P*	
No. of Subjects Measured‡		DXA	n=14	n=14			n=11	n=11			
		pQCT	n=16	n=16			n=15	n=15			
DXA (mg/cm^2)	Spine	L2–4	.901±.147	.884±.134	−1.6±3.5	.065	.812±.115	.806±.118	−1.2±3.0	.335	.801
		Neck	.799±.114	.774±.091	−3.0±3.5	.010*	.714±.093	.701±.089	−1.6±4.0	.180	.366
	Proximal femur	Intertrochanter	.639±.090	.631±.087	−1.2±4.4	.373	.586±.094	.575±.093	−1.8±2.9	.096	.722
		Ward's triangle	.590±.100	.586±.083	−0.2±7.8	.744	.523±.092	.508±.087	−2.9±3.6	.031*	.302
pQCT (mg/cm^3)	Ultradistal tibia	tBMD	233±50	231±50	−1.10±1.26	.002†	205±27	200±26	−2.18±1.60	.000†	.044*
		iBMD	469±69	460±67	−1.93±1.55	.000	442±84	431±80	−2.34±1.19	.000†	.420
	Distal tibial diaphysis	$cBMD_T$	1533±50	1520±46	−0.90±1.36	.018*	1547±69	1519±70	−1.86±0.93	.000†	.031*
		$cBMD_O$	909±103	896±101	−1.41±1.46	.001*	899±154	879±155	−2.26±1.53	.000†	.126

A STUDY ON TAI JI EXERCISE AND TRADITIONAL CHINESE MEDICAL MODALITIES IN RELATION TO BONE STRUCTURE, BONE FUNCTION AND MENOPAUSAL SYMPTOMS

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Table 1: Effects of Tai Ji on BUA and bone turnover markers (n=12)

	Pre-Treatment	Post-treatment	Change	P
BUA (dB/MHz)	72.5±13.4	77.8±12.8	5.3	0.001
Osteocalcin(OSTN) (ng/ml)	14.6±7.8	20.3±9.9	5.7	0.001
Pyridinoline (PYR) (nmol/mmol Cr)	61.9±17.3	56.8±22.1	-5.1	0.272
Deoxypyridinoline (D-PYR) (nmol/mmol Cr)	12.7±4.3	11.1±s5.0	-1.6	0.079

A STUDY ON TAI JI EXERCISE AND TRADITIONAL CHINESE MEDICAL MODALITIES IN RELATION TO BONE STRUCTURE, BONE FUNCTION AND MENOPAUSAL SYMPTOMS

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Table 2: Effects of Acupuncture on BUA and bone turnover markers (n=14)

	Pre-Treatment	Post-treatment	Change	P
BUA (dB/MHz)	73.0±14.8	79.4±17.9	6.4	0.005
Osteocalcin(OST-N) (ng/ml)	18.8±8.4	24.6±7.2	5.7	0.006
Pyridinoline (PYR) (nmol/mmol Cr)	66.4±14.6	62.8±18.9	-3.6	0.493
Deoxypyridinoline (D-PYR) (nmol/mmol Cr)	66.4±14.6	11.9±4.0	-2.7	0.002

A STUDY ON TAI JI EXERCISE AND TRADITIONAL CHINESE MEDICAL MODALITIES IN RELATION TO BONE STRUCTURE, BONE FUNCTION AND MENOPAUSAL SYMPTOMS

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Table 3: Effects of Herbal Therapy on BUA and bone turnover markers (n=14)

	Pre-Treatment	Post-treatment	Change	P
BUA (dB/MHz)	63.6±13.7	68.0±15.1	4.4	0.03
Osteocalcin(OST-N) (ng/ml)	19.4±11.0	23.6±10.5	4.2	0.029
Pyridinoline (PYR) (nmol/mmol Cr)	73.0±18.0	64.5±17.0	-8.5	0.071
Deoxypyridinolin-e (D-PYR) (nmol/mmol Cr)	17.0±4.6	14.2±4.2	-2.8	0.011

Table 4: Effects of Tai Ji on Common Symptoms (n=12)									
Symptom*/ Number of subjects	Pre-Treatment Degree of Symptoms*				Post-Treatment Degree of Symptom*				Ridit p**
	0	1	2	3	0	1	2	3	
Lower back pain	5	3	3	1	9	2	1		
Knees/Leg/Feet	8	1	3		11	2			
Abdominal	5	5	2		10	2			<0.05
Diarrhoea	11	1			12				
Swollen	8	2	2		10	2			
Tiredness	7	3	2		11	1			<0.05
Palpitations	9	2	1		12				
Hot flushes	3	5	4		9	3			<0.01
Night sweats	4	4	4		9	3			<0.05
Insomnia	9	1	2		10	2			
Irritability/Anxiety	8		3	1	8	2	2		
Headache	8		2	2	10	2			
Thirst	7	5			10	2			
Itchy skin	9	2	1		10	2			
Constipation	9	1	1	1	9	1	2		
Dark/smelly urine	8	1	3		9	3			
*0 = No symptoms; 1 = Mild symptoms; 2 = Medium symptoms; 3 = Severe symptoms									
** Ridit analysis showing symptom relief of statistically significant level.									

Table 5: Effects of Acupuncture on Common Symptoms (n=14)									
Symptom*/ Number of subjects	Pre-Treatment Degree of Symptoms*				Post-Treatment Degree of Symptom*				Ridit p**
	0	1	2	3	0	1	2	3	
Lower back pain	2	5	4	3	8	5	1		<0.01
Knees/Leg/Feet	5	2	4	3	10	4			<0.01
Abdominal	8	3	2	1	13	1			<0.05
Diarrhoea	9	5			13	1			
Swollen	8	2	2	2	14				<0.01
Tiredness	2	7	2	3	13		1		<0.01
Palpitations	7	6	1		12	2			<0.05
Hot flushes		5	8	1	5	9			<0.01
Night sweats	1	7	5	1	11	3			<0.01
Insomnia	3	6	3	2	8	5	1		<0.05
Irritability/Anxiety	9	2	2	1	12	1	1		
Headache	4	1	7	2	7	7			<0.01
Thirst	4	3	5	2	9	3	2		<0.05
Itchy skin	13		1	14					
Constipation	8	5	3		9	6	1		
Dark/smelly urine	7	3	3	1	11	2	1		
*0 = No symptoms; 1 = Mild symptoms; 2 = Medium symptoms; 3 = Severe symptoms									
** Ridit analysis showing symptom relief of statistically significant level.									

Table 6: Effects of Herbal Treatment on Common Symptoms (n=14)									
Symptom*/ Number of subjects	Pre-Treatment Degree of Symptoms*				Post-Treatment Degree of Symptom*				Ridit p**
	0	1	2	3	0	1	2	3	
Lower back pain	7	4	2	1	12	2			<0.05
Knees/Leg/Feet	10	4		1	13		1		
Abdominal	7	4	3		10	3	1		
Diarrhoea	13	1			14				
Swollen	13		1	1	13		1		
Tiredness	4	4	6		13	1			<0.01
Palpitations	9	3	2		13	1			
Hot flushes	1	8	5	0	9	5			<0.01
Night sweats	4	4	6		7	7			<0.05
Insomnia	1	8	5		11	3			<0.01
Irritability/Anxiety	8	1	2	3	11	3			
Headache	4	5	5		7	7			<0.05
Thirst	4	6	2	2	12	2			<0.01
Itchy skin	12	1	1		14				
Constipation	8	3	2	1	12	1	1		
Dark/smelly urine	12		2		12	2			
*0 = No symptoms; 1 = Mild symptoms; 2 = Medium symptoms; 3 = Severe symptoms									
** Ridit analysis showing symptom relief of statistically significant level.									

Tables 4, 5 and 6 indicate that acupuncture produced a greater number of statistically significant improvements in symptoms than the other two modalities. Acupuncture proved more effective in treating palpitations. Acupuncture and herbal treatment were more effective in treating irritability/anxiety/stress. Herbal treatment was more effective in treating constipation, demonstrating the effectiveness of the herbs in nourishing yin (body fluid). As this study only used single treatment modalities the effects of using more than one treatment modality at the same time is unknown.

2 cross-sectional studies

Study	Effects of long-term shadowboxing exercise on bone mineral density in the aged	Beneficial effects of regular Tai Chi exercise on musculoskeletal system
location	Shanghai, PRC J Clin Rehabil 2003;7:2238-9.	Hong Kong J Bone Miner Metab2005;23:186-90
Participant	Community-dwelling men and women	Postmenopausal community-dwelling women
Interventions and Comparison	• Long-term Tai Chi practitioners (min 5y experience) (n=28) •Age-matched sedentary controls (n=32)	•Long-term Tai Chi practitioners (min 3y experience) (n=48) •Age-matched sedentary controls (n=51)
Outcome	BMD significantly greater in L1 through L4 and femur for Tai Chi vs control. 5–10y experience not different from 10+	Significantly greater BMD in lumbar spine and some regions of femur (greater trochanter, Ward's area) in Tai Chi vs control. Greater quad strength and balance in Tai Chi vs control

太極拳 vs. 骨質密度

Data Synthesis: Six controlled studies were identified by our search. There were 2 RCTs, 2 nonrandomized prospective parallel cohort studies, and 2 cross-sectional studies. The 2 RCTs and 1 of the prospective cohort studies suggested that Tai Chi-naive women who participated in Tai Chi training exhibited reduced rates of postmenopausal declines in BMD. Cross-sectional studies suggested that long-term Tai Chi practitioners had higher BMD than age-matched sedentary controls, and had slower rates of postmenopausal BMD decline. No adverse effects related to Tai Chi were reported in any trial.

Conclusions: Conclusions on the impact of Tai Chi on BMD are limited by the quantity and quality of research to date. This limited evidence suggests Tai Chi may be an effective, safe, and practical intervention for maintaining BMD in postmenopausal women. In combination with research that indicates Tai Chi can positively impact other risk factors associated with low BMD (eg, reduced fall frequency, increased musculoskeletal strength), further methodologically sound research is warranted to better evaluate the impact of Tai Chi practice on BMD and fracture risk in postmenopausal women.

How are the results presented?

結果如何呈現?

- Meta-analysis (統合分析)→No
- Exploring heterogeneity (檢驗差異性)→No

Because only a small number of the studies we retrieved were randomized controlled trials (RCTs), and because RCTs employing Tai Chi interventions are not amenable to double-blinding, we chose not to use a more traditional instrument (eg, Jadad score)[67] to evaluate study methodologic quality. Rather, study quality was descriptively characterized with respect to reporting of the following criteria: randomization (yes or no); details of randomization methods; clear inclusion and exclusion criteria; blinding of outcomes assessors; description of withdrawal and dropouts; sample size estimates and justification; use of appropriate statistical analyses; details of Tai Chi intervention (eg, style, training schedule); and experience of Tai Chi instructors (table 1).

Table 1: Quality of Design and Methodologic Features of Studies Evaluating Tai Chi for Low BMD

Features	Qin et al[70]	Gong et al[72]	Chan et al[68]	Zhou[69]	Xu et al[71]	Qin et al[73]
Randomization employed	–	–	√	√	–	–
Randomization methods	NA	NA	√	–	NA	NA
Clear inclusion/exclusion criteria	√	√	√	–	–	√
Outcome assessors blinded	–	–	–	–	–	–
Withdrawal and dropouts reported	√	–	√	–	–	–
Sample size justified/estimated	–	–	√	–	–	–
Appropriate data analysis	√	√	√	√	–	√
Tai Chi intervention described	–	–	√	√	√	–
Qualifications of Tai Chi instructors	–	–	–	–	–	–

Abbreviation: NA, not applicable.
Legend: √, design and methodology feature adequately reported; –, design and methodology feature not adequately reported.

Step 4

Apply to your patient

實際應用到你的病人

打太極拳可以改善
我的骨質密度嗎?

對停經後婦女而言，打太極拳可以增加肌肉延展性、平衡力，改善日常生活功能，臨床研究指出可以減緩骨質密度的流失，但維持或增加骨質密度的證據仍顯不足。

Step 5

Evaluation our performance

評估表現與施行效率

Self – Evaluation（自我評估）

- 我提出的問題是否具有臨床重要性？我是否明確的陳述了我的問題？
- 我是否已盡全力搜尋？我是否從大量的資料庫來搜尋答案？
- 我是否盡全力做評讀了？評讀後，我是否做出了結論？
- 我是否覺得這個進行實證醫學的過程是值得的？
- 我還有那些問題或建議？

Thanks for attention~