1.4 Tai chi

Is tai chi effective in reducing pain and improving function in patients with symptomatic knee OA compared to usual care (education about OA)?

Step 1: Search Results
One systematic review (Escalante, 2010) assessed the effect of tai chi in patients with lower limb OA. However, the pooled effect size of the 10 RCTs was not provided. We did not calculate it since there was high heterogeneity between the trials (type, duration and frequency of tai chi and control group intervention). Therefore, we chose the RCT from this systematic review which had an appropriate intervention, control group, outcomes (pain, function and safety) and the largest sample size (n=40) (Wang, 2009). It was also one of the most recent trials of Tai chi.

Intervention description: Modified Yang-style tai chi with experienced Tai chi master for 60 minutes twice a week for twelve weeks. The control group received wellness education and stretching. Every session included: (1) 10 minute self-massage and a review of Tai Chi principles; (2) 30 minutes of Tai Chi movement; (3) 10 minutes of breathing technique; (4) 10 minutes of relaxation. The program consisted of 10 forms from classical Yang Style Tai Chi (20) with minor modifications that were suitable for people with knee pain. This involved eliminating stances that require greater than 90° knee-flexion and can cause excess knee joint stress (21). We also provided a Tai Chi DVD published by R Rones. Patients were instructed to practice Tai Chi at least 20 minutes a day at home and encouraged to maintain their usual physical activities, but not to participate in additional new strength training or exercise programs other than Tai Chi.

Step 2: GRADE Summary of findings

	Tai chi compared to no exercise (education on OA) for knee OA **Patient or population:** patients with osteoarthritis of the knee **Intervention:** tai chi **Comparison:** no exercise (education on OA)						
Outcomes	**Illustrative comparative risks* (95% CI)**		**Relative effect (95% CI)**	**Absolute difference**	**No of Participants (studies)**	**Quality of the evidence (GRADE)**	**NNT**
	Assumed risk **no exercise (education on OA)**	Corresponding risk **Tai chi**					
Benefit							
Pain WOMAC . Scale from: 0 to 35. (follow-up: mean 12 weeks)	36%	77% of those in tai chi group experienced a decrease in pain (53% to 92%)	2	41%	40 (1[3])	⊕⊕⊕O moderate[1]	3 (2 to 5)
Function WOMAC. Scale from: 0 to 85. (follow-up: mean 12 weeks)	34%	73% (49% to 90%)	2	39%	40 (1[3])	⊕⊕⊕O moderate[1]	3 (2 to 6)

Summary of Findings – May 4, 2011 – Tai chi

Harms							
Withdrawals Number of drop-outs (follow-up: mean 12 weeks)	0%	0%	RR not estimable	Not estimable	40 (1[3])	⊕⊕⊕O moderate[1]	Not estimable
Attendance Number of patients who attended the treatment sessions (follow-up: mean 12 weeks)	89% *estimated to 18/20 patients	85%	RR 0.94 (0.75 to 1.19)	-4%	40 (1[3])	⊕⊕⊕O moderate[1]	Not statistically significant
Safety Number of adverse events (follow-up: mean 12 weeks)	0%	5%	RR 11 (0.65 to 186.62)	5%	40 (1[3])	⊕⊕OO low[1,2]	Not statistically significant

[1] The control group appears to have had more severe knee OA at baseline. This difference likely occurred by chance as a result of the relatively small sample size. Also, the study could not mask the participants to treatment assignment. However, authors attempted to minimize such expectations by maintaining a stance of equipoise regarding the likely benefits of the two interventions and expectations of benefit were similar in both groups at baseline. We did not downgrade the quality of the study because of the last aspect.

[2] The effect size ranges from not being clinically significant to very clinically significant.

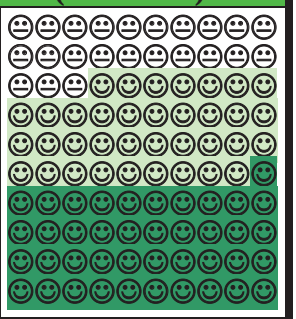
[3]The included trial was conducted by Wang, 2009.

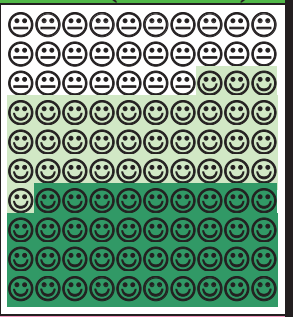
Summary of Findings – May 4, 2011 – Tai chi

Visual Summary of Findings Table

Tai chi compared to no exercise (education on OA) for osteoarthritis of the knee

Issue **Evidence from SRs and trials** **Judgment** (panel)
1. Balance between desirable and undesirable effects

Chance: Improving pain (12 weeks.)	
NNT: 3	
23% 😐 Don't improve	
36% ☺ Improve with or without Rx	
41% ☺ Benefit with Rx→	

Chance: Improving function (12 weeks)	
NNT: 3	
27% 😐 Don't improve	
34% ☺ Improve with or without Rx	
39% ☺ Benefit with Rx→	

Chance: Withdrawals (12 weeks.)
Not estimable

Chance: Attendance
Not statistically significant

Chance: Safety	
Not statistically significant	
95% 😐 Avoid bad outcome	
0% ☹ Bad outcome with or without Rx	
5% ☹ Harmed by Rx→	

Summary of Findings – May 4, 2011 – Tai chi

Step 3: GRADE Evidence profile

Tai Chi compared to no exercise (education on OA) for knee OAAuthor(s):
Jessie McGowan, Maria Benkhalti**,** Karine Toupin April
Date: 2011-05-03
Question: Should tai chi versus no exercise (education on OA) be used for osteoarthritis of the knee?
Bibliography: Wang, 2009 in Escalante, 2010

Quality assessment							Summary of findings					Importance
							No of patients		Effect			
No of studies	Design	Limitations	Inconsistency	Indirectness	Imprecision	Other considerations	Tai Chi	no exercise (education on OA)	Relative (95% CI)	Absolute	Quality	
Pain (follow-up mean 12 weeks; measured with: WOMAC; range of scores: 0-35; Better indicated by less)												
1[1]	randomised trial	serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	20	20	2	SMD -1.11 (-1.78 to -0.44)	⊕⊕⊕O MODERATE	CRITICAL
Function (follow-up mean 12 weeks; measured with: WOMAC; range of scores: 0-85; Better indicated by less)												
1[1]	randomised trial	serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	20	20	2	SMD -1.04 (-1.71 to -0.38)	⊕⊕⊕O MODERATE	CRITICAL
Withdrawals (follow-up mean 12 weeks; Number of drop-outs)												
1[1]	randomised trial	serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	0/20 (0%)	0/20 (0%)	RR not estimable	Not estimable	⊕⊕⊕O MODERATE	IMPORTANT
Attendance (follow-up mean 12 weeks; Number of patients who attended the treatment sessions)												
1[1]	randomised trial	serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	17/20 (85%)	18/20 (89%)	RR 0.94 (0.75 to 1.19)	90 fewer per 100 (from 90 fewer to 90 fewer)	⊕⊕⊕O MODERATE	IMPORTANT
Safety (follow-up: mean 12 weeks; Number of adverse events)												
1[1]	randomised trial	serious[2]	no serious inconsistency	no serious indirectness	serious[3]	none	1/20 (85%)	0/20 (89%)	RR 11 (0.65 to 186.62)	0 fewer per 100 (from 0 fewer to 0 more)	⊕⊕OO LOW	IMPORTANT

[1] The included trial was conducted by Wang, 2009.
[2] The control group appears to have had more severe knee OA at baseline. This difference likely occurred by chance as a result of the relatively small sample size. Also, the study could not mask the participants to treatment assignment. However, authors attempted to minimize such expectations by maintaining a stance of equipoise regarding the likely benefits of the two interventions and expectations of benefit were similar in both groups at baseline. We did not downgrade the quality of the study because of the last aspect.
[3] The effect size ranges from not being clinically significant to very clinically significant.

Step 4: Other recommendations

Group	Recommendation
AAOS (knee only)	We recommend patients with symptomatic OA of the knee be encouraged to participate in low-impact aerobic fitness exercises. Range of motion/flexibility exercises are an option for patients with symptomatic OA of the knee. We suggest quadriceps strengthening for patients with symptomatic OA of the knee.
EULAR	Non-pharmacological treatment of knee OA should include education, *exercise*, appliances (sticks, insoles, knee bracing) and weight reduction.
OARSI	Patients with hip and knee OA should be encouraged to undertake, and continue to undertake, regular aerobic, muscle strengthening and range of motion exercises. For patients with systematic hip OA, exercises in the water can be effective.

References

C. Wang, C.H. Schmid, P.L. Hibberd, R. Kalish, R. Roubenoff, R. Rones and T. McAlindon, Tai Chi is effective in treating knee osteoarthritis: a randomized controlled trial, *Arthritis and Rheumatism* **61**(11) (2009), 1545–1553.

Escalante Y, Saavedra JM, Garcia-Hermoso A, Silva AJ, Barbosa TM. Physical exercise and reduction of pain in adults with lower limb osteoarthritis: a systematic review. J Back Musculoskelet Rehabil 2010; 23(4):175-186.