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aromatase inhibitor-induced arthralgia

Arthralgies sous anti-aromatases

1. Systematic Reviews and Meta-Analysis

1.1. Generic Acupuncture

1.1.1. Zhu 2025

Zhu Z, Yuan X, Zheng Y, Dou B, Liu L, Loh PY, Chen B, Chen A, Ma P, Chen Z, Guo Y. Effectiveness of acupuncture in managing aromatase inhibitor-related arthralgia in breast cancer: a systematic review and meta-analysis. Acupunct Herb Med. 2025 Sep;5(3):352-365.
https://doi.org/10.1097/HM9.0000000000000172

Background	Breast cancer is the second most prevalent cause of mortality in women and the predominant malignancy type. However, breast cancer treatment faces challenges in managing aromatase inhibitor-induced arthralgia. Aromatase inhibitors have been shown to decrease recurrence risk in hormone receptor-positive cases; however, joint discomfort remains the primary adverse effect. Randomized clinical trials have evaluated the therapeutic outcomes of acupuncture for medication-related musculoskeletal complications.
Objective	This comprehensive analysis sought to elucidate both the therapeutic efficacy and placebo responses associated with acupuncture intervention.
Methods	Two reviewers searched for randomized controlled trials (RCTs) in four English (PubMed, Embase, Web of Science, and the Cochrane Library) and four Chinese databases (CNKI, Wanfang Database, VIP, and SinoMed) from their inception to May 31, 2024. Methodological quality was assessed using the Cochrane risk of bias tool. Data were synthesized using random effects models and presented with forest plots.
Results	**Seven trials involving 604 patients** were included. The primary outcome and Brief Pain Inventory (BPI) score differed between the acupuncture and control groups (sham acupuncture or usual medication) in three subscales over the course of 6 weeks: worst pain: standardized mean difference (SMD) = −1.18, 95% confidence interval (CI): −1.74, −0.63, P < 0.001; pain-related interference: SMD = −0.87, 95% CI: −1.70, −0.05, P = 0.038; pain severity: SMD = −0.63, 95% CI: −1.22, −0.04, P = 0.036. No severe adverse events were reported in any study.
Conclusion	This meta-analysis showed that acupuncture is a safe and effective treatment for patients with breast cancer with aromatase inhibitor-induced arthralgia during the course of 6 weeks. Improvements in the blinding method and clarification of the total treatment recommendations and intervals need to be explored further.

1.1.2. Bae 2023

Bae K, Lamoury G, Carroll S, Morgia M, Lim S, Baron-Hay S, Shin IS, Park SJ, Oh B. Comparison of the clinical effectiveness of treatments for aromatase inhibitor-induced arthralgia in breast cancer patients: A systematic review with network meta-analysis. Crit Rev Oncol Hematol. 2023

Jan;181:103898. https://doi.org/10.1016/j.critrevonc.2022.103898

Background	Aromatase inhibitor-induced arthralgia (AIA) contributes to poor adherence of aromatase inhibitor therapies in patients with breast cancer.
Methods	A systematic review using network meta-analysis (NMA) was conducted to examine the clinical effectiveness of multiple therapies and rank probabilities for the management of AIA. Randomized controlled trials (RCTs) assessing treatments for AIA in postmenopausal women with stage 0-III hormone receptor-positive breast cancer were searched from inception to October 2021.
Results	The main NMA involved 1516 participants from 17 RCTs. **Acupuncture was the highest ranked intervention to improve pain intensity** followed by sham acupuncture, multicomponent herbal medicine, exercise, duloxetine, vitamin D, omega-3 fatty acids, physical therapy, testosterone, and inactive controls. Single natural products were inferior to controls.
Conclusions	The current review provides new insights into the management of AIA in breast cancer survivors for increased survival and can be utilized to make evidence-based decisions regarding treatment.

1.1.3. Qi 2022

Qi QL, Han X, Tang C. Effects of Acupuncture on Breast Cancer Patients Taking Aromatase Inhibitors. Biomed Res Int. 2022 Sep 12;2022:1164355. https://doi.org/10.1155/2022/1164355

Background	Although acupuncture has been used in clinical practice for thousands of years, it remains a controversial treatment option to help alleviate pain in cancer patients.
Methods	In this study, we analyzed published material on randomized trials of acupuncture from MEDLINE published up until July 31, 2018, to assess its effects on pain experienced by cancer patients. Revman 5.0 software was used to conduct meta-analysis with pain score as the index.
Results	The results of **nine randomized controlled trials involving 592 patients** were analyzed and showed that acupuncture can relieve the pain caused by aromatase inhibitors. Weighted mean difference of worst pain and pain severity was -3.03, 95% CI (-3.90,-2.16) and -2.69, 95% CI (-4.08,-1.30), respectively ($P < 0.01$).
Conclusions	This led us to conclude that acupuncture has pain relieving effects against pain caused by aromatase inhibitors.

1.1.4. Li 2021

Li H, Schlaeger JM, Jang MK, Lin Y, Park C, Liu T, Sun M, Doorenbos AZ. Acupuncture Improves Multiple Treatment-Related Symptoms in Breast Cancer Survivors: A Systematic Review and Meta-Analysis. J Altern Complement Med. 2021 Dec;27(12):1084-1097. https://doi.org/10.1089/acm.2021.0133

Introduction	Acupuncture has demonstrated effectiveness for symptom management among breast cancer survivors. This meta-analysis aims to evaluate the effect of acupuncture on treatment-related symptoms among breast cancer survivors.
Methods	The authors searched PubMed, CINAHL, and EMBASE for relevant randomized clinical trials (RCTs) of acupuncture for managing treatment-related symptoms published in English through June 2021. They appraised the quality of each article using the Cochrane Collaboration Risk of Bias Criteria. The primary outcomes were pain, hot flashes, sleep disturbance, fatigue, depression, lymphedema, and neuropathy as individual symptoms. They also evaluated adverse events reported in acupuncture studies.

Results	Of 26 selected trials (2055 patients), 20 (1709 patients) were included in the meta-analysis. **Acupuncture was more effective than control groups in improving pain intensity [standardized mean difference (SMD) = −0.60, 95% confidence intervals (CI) −1.06 to −0.15]**, fatigue [SMD = −0.62, 95% CI −1.03 to −0.20], and hot flash severity [SMD = −0.52, 95% CI −0.82 to −0.22]. The subgroup analysis indicated that acupuncture showed trends but not significant effects on all the treatment-related symptoms compared with the sham acupuncture groups. Compared with waitlist control and usual care groups, the acupuncture groups showed significant reductions in pain intensity, fatigue, depression, hot flash severity, and neuropathy. No serious adverse events were reported related to acupuncture intervention. Mild adverse events (i.e., bruising, pain, swelling, skin infection, hematoma, headache, menstrual bleeding) were reported in 11 studies.
Conclusion	This systematic review and meta-analysis suggest that acupuncture significantly reduces multiple treatment-related symptoms compared with the usual care or waitlist control group among breast cancer survivors. The safety of acupuncture was inadequately reported in the included studies. Based on the available data, acupuncture seems to be generally a safe treatment with some mild adverse events. These findings provide evidence-based recommendations for incorporating acupuncture into clinical breast cancer symptom management. Due to the high risk of bias and blinding issues in some RCTs, more rigorous trials are needed to confirm the efficacy of acupuncture in reducing multiple treatment-related symptoms among breast cancer survivors.

1.1.5. Liu 2021 ☆☆

Liu X, Lu J, Wang G, Chen X, Xv H, Huang J, Xue M, Tang J. Acupuncture for Arthralgia Induced by Aromatase Inhibitors in Patients with Breast Cancer: A Systematic Review and Meta-analysis. Integr Cancer Ther. 2021. [217092]. doi

Background	Aromatase inhibitor-induced arthralgia (AIA) is the most common side effect of aromatase inhibitors (AIs) used in breast cancer patients and is related to the rate of adherence to AIs. The clinical effects of acupuncture on AIA have been assessed by some randomized controlled trials (RCTs). However, some studies reported that acupuncture was effective, while others claimed that it was ineffective. To clarify the clinical and placebo effects of acupuncture in treating AIA, we conducted this meta-analysis.
Methods	Two reviewers (XL and GW) independently searched for RCTs in 5 English databases (PubMed, Web of Science, Embase, Springer, Cochrane Library) and 4 Chinese databases (China National Knowledge Infrastructure Database (CNKI), SinoMed, VIP and Wanfang Database) from their inception to 30 November 2019. Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, this meta-analysis was performed by fixed or random-effects models, and data were pooled with mean differences (MDs).
Results	**Seven trials involving 603 patients** were reviewed. The primary outcome, the Brief Pain Inventory (BPI) score, significantly differed between the acupuncture and control groups [pain-related interference: MD = -1.89, 95% confidence interval (CI) [-2.99, -0.79], Z = 3.36 (P = .008 < .05), pain severity: MD = -1.57, 95% CI [-2.46, -0.68], Z = 3.45 (P = .0006 < .05), worst pain: MD = -2.31, 95% CI [-3.15, -1.48], Z = 5.47 (P < .0001 < .05)]. No severe adverse events were reported in any study.
Conclusion	This meta-analysis showed that acupuncture is a safe and effective treatment for breast cancer patients with AIA. Additional research with improved blinding methods is warranted to further explore the nature of non-specific and placebo effects in true and sham acupuncture.

1.1.6. Zhu 2021

Zhu XY, Li Z, Chen C, Feng RL, Cheng BR, Liu RY, Wang RT, Xu L, Wang Y, Tao X, Zhao P. Physical Therapies for Psychosomatic Symptoms and Quality of Life Induced by Aromatase Inhibitors in Breast Cancer Patients: A Systematic Review and Meta-Analysis. Front Oncol. 2021 Nov 12;11:745280. https://doi.org/10.3389/fonc.2021.745280

Objective	To evaluate the effects of Physical Therapies (PTs) on improvement in psychosomatic symptoms and quality of life (QOL) in breast cancer patients.
Methods	Data sources: Seven databases (MEDLINE, EMBASE, Cochrane CENTRAL, China National Knowledge Infrastructure, Wangfang, VIP, and China Biology Medicine disc databases) were systematically searched from the database inception through May 18, 2021. Study selection: Randomized controlled trials (RCTs) which compared acupuncture or exercise with a sham control or usual care for the treatment of aromatase inhibitors (AIs)-related psychosomatic symptoms and QOL. Data extraction and synthesis: Data were screened and extracted independently using predesigned forms. The quality of RCTs was assessed with the Cochrane Handbook for Systematic Reviews of Interventions. The effect size was calculated via random-effects modeling. The quality of evidence was evaluated with the Grading of Recommendations Assessment, Development and Evaluation approach. Main outcomes and measures: The score of pain was measured with BPI scale and Western Ontario and the McMaster Universities Index (WOMAC) scale. Emotional state was measured with Pittsburgh Sleep Quality Index (PSQI), Hospital Anxiety and Depression Scale (HADS-A), and Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-Fatigue). The QOL score was measured by self-reported measurements, including the Functional Assessment of Cancer Therapy-General (FACT-G) scale and 36-Item Short Form Survey (SF-36) scale.
Results	**Eleven RCTs (with 830 patients)** were included in the systematic review, and data from 10 RCTs (with 798 patients) were used in the meta-analysis. Results showed acupuncture significantly reduced worst pain scores (P < 0.00001, I 2 = 83.5%) [SMD = -0.81, 95% CI (-1.51, -0.11)], but the effect of exercise therapies was not significant in overall change in worst pain scores (P =0.006, I 2 = 72.3%) [SMD = -0.30, 95% CI (-0.76, 0.16)]. Both acupuncture and exercise resulted in little to no difference in overall change in HADS-A subscale (P = 0.026<0.05, I 2 = 79.8%) [WMD = -0.21, 95% CI (-3.44, 3.03)], PSQI subscale (P = 0.488, I 2 = 0%) [WMD = 0.98, 95% CI (-0.57, 2.53)], and FACIT-Fatigue subscale (P = 0.022<0.05, I 2 = 81.0%) [WMD = 1.6, 95% CI (-5.75, 8.94)]. Exercise (compared with usual care) was associated with improving overall change in health-related QOL (subscales of SF-36 tool) (P = 0, I 2 = 72.1%) [WMD = 7.97, 95% CI (5.68, 10.25)] and cancer-specific QOL (subscales of FACT-G tool) (P = 0.304, I 2 = 16%) [WMD = 1.16, 95% CI (0.34, 1.97)].
Conclusions and relevance	This systematic review and meta-analysis suggested that based on moderate-level evidence, acupuncture was associated with significant reductions in pain intensity, and exercise might improve QOL in breast cancer patients treated with AIs. However, in psychosomatic symptoms such as anxiety, sleep disturbance, and fatigue, acupuncture and exercise training did not result in significant improvements.

1.1.7. Chen 2017

Chen L, Lin CC, Huang TW et al. Effect of acupuncture on aromatase inhibitor-induced arthralgia in patients with breast cancer: A meta-analysis of randomized controlled trials. Breast. 2017;33:132-138. [186564].

Background	Aromatase inhibitor (AI)-induced arthralgia (AIA) is a common side effect that may lead to premature discontinuation of effective hormonal therapy in patients with breast cancer. Acupuncture may relieve joint pain in patients with AIA.
Objective	We conducted a meta-analysis of randomized controlled trials (RCTs) to evaluate the effectiveness of acupuncture in pain relief in AIA.
Methods	The PubMed, Embase, Cochrane Library, and Scopus databases and the ClinicalTrials.gov registry were searched for studies published before February 2017. Individual effect sizes were standardized, and a meta-analysis was conducted to calculate the pooled effect size by using a random effect model. Pain was assessed using the Brief Pain Inventory (BPI) and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) at 3-4, 6-8, and 12 weeks. Secondary outcomes included disability level, upper extremity function, physical performance, and quality of life.
Results	Five trials involving 181 patients were reviewed. Significant pain reduction was observed after 6-8 weeks of acupuncture treatment. Patients receiving acupuncture showed a significant decrease in the BPI worst pain score (weighted mean difference [WMD]: -3.81, 95% confidence interval [CI]: -5.15 to -2.47) and the WOMAC pain score (WMD: -130.77, 95% CI: -230.31 to -31.22) after 6-8 weeks of treatment. One of the 4 trials reported 18 minor adverse events in 8 patients during 398 intervention episodes.
Conclusion	Acupuncture is a safe and viable nonpharmacologic treatment that may relieve joint pain in patients with AIA. Additional studies involving a higher number of RCTs are warranted.

1.1.8. Yang 2017

Yang GS, Kim HJ, Griffith KA, Zhu S, Dorsey SG, Renn CL. Interventions for the Treatment of Aromatase Inhibitor-Associated Arthralgia in Breast Cancer Survivors: A Systematic Review and Meta-analysis. Cancer Nurs. 2017;40(4):e26-e41. [171528].

Background	Aromatase inhibitors (Ais) have been established as successful adjuvant therapy for breast cancer survivors. Unfortunately, nearly half of women taking Ais report joint pain, AI-associated arthralgia (AIA). Aromatase inhibitor-associated arthralgia often results in noncompliance, which could lead to cancer recurrence.
Objective	The purpose of this study was to identify current pain management of AIA and to evaluate the study quality and effects of interventions.
Methods	Nineteen articles published from 2000 to August 2015 were identified using PubMed, CINAHL, PsycINFO, Web of Science, and additional records. Study quality was evaluated by the Quality Assessment Tool for Quantitative Studies. Meta-analysis was used to obtain effect sizes of interventions on pain and subgroups.
Results	Five types of interventions emerged: pharmacological approaches, **acupuncture,** nutritional supplementation, relaxation techniques, and physical exercise. Six studies were strong, 8 were moderate, and 5 were weak in quality. The overall effect size of the interventions on pain was large; **pharmacological approaches, acupuncture, and relaxation techniques showed moderate to large effects on pain**, whereas nutritional supplementation and physical exercise had no significant effects on it.
Conclusion	The evidence was based on a body of research with moderate study quality. Although the overall effect of interventions is large, further investigation into the influence of nutrition and physical exercise is needed to better discern their potential for pain management.
Implication for practice	Oncology nurses may be able to implement such validated interventions as pain management modalities to mitigate the symptoms so that breast cancer survivors remain compliant with AIA therapy.

1.1.9. Roberts 2017

Roberts K, Rickett K, Greer R, Woodward N. Management of aromatase inhibitor induced musculoskeletal symptoms in postmenopausal early Breast cancer: A systematic review and meta-analysis. Crit Rev Oncol Hematol. 2017;:66-80. [141241].

> Aromatase Inhibitors (AI) are widely used for the adjuvant treatment of hormone receptor positive breast cancers in the post-menopausal population. AI are often associated with significant joint and muscular symptoms; symptoms that are commonly referred to as aromatase inhibitor-associated musculoskeletal syndrome (AIMSS). AIMSS adversely impacts health-related quality of life of many patients, and reduces AI compliance. Although there are informal practice recommendations, the limited current level of evidence for management of AIMSS for breast cancer patients on aromatase inhibitors has made development of formal guidelines challenging, and remains an unmet need. This is the first systematic review to consider the evidence for all pharmacological and non-pharmacological interventions in the treatment of AIMSS, including physical therapy, acupuncture and complementary therapies.

The evidence for acupuncture is not strong enough to recommend it for the treatment of AIMSS. Although the interventions generally appear tolerable with minimal adverse effects, the current level of evidence is low, and additional large RCTs with more rigorous control for contamination from other interventions are required to confirm some of the reported promis-ing results.

1.1.10. Bae 2015

Bae K, Yoo HS, Lamoury G, Boyle F, Rosenthal DS5, Oh B. Acupuncture for Aromatase Inhibitor-Induced Arthralgia: A Systematic Review.. Integr Cancer Ther. 2015;14(6):496-502. [187753].

Background	Aromatase inhibitors (Ais) are commonly used as adjunctive hormone treatment for early breast cancer patients. The major side effect of Ais is arthralgia, which affects adherence. Previous reviews suggested that acupuncture is effective in the management of cancer-related pain. The aim of this review is to evaluate the effects of acupuncture on arthralgia caused by Ais.
Methods	This article examined randomized controlled trials (RCTs) measuring the effects of acupuncture on joint symptoms caused by Ais within 8 medical databases till May 2014. The quality of the articles was evaluated according to the Cochrane risk of bias (ROB) tool.
Results	**Four RCTs were identified** in medical journals. Two studies were conducted with manual acupuncture and 2 studies were electroacupuncture. The range of sample size was between 32 and 67. One RCT showed significant improvement in the acupuncture group compared with the sham control group and another RCT showed a statistical difference between the electroacupuncture and waitlist group. The other 2 studies showed no statistical differences between control and acupuncture groups. Two studies conducted blood analysis to elucidate the mechanism of efficacy of acupuncture for arthralgia. The 2 positive studies had a lower ROB and 2 studies had a high ROB.
Conclusions	**The systematic review suggests that acupuncture has potential benefits to improve arthralgia caused by Ais**. However, further trials of adequate sample size, appropriate control group, and longer follow-up are necessary to investigate the efficacy of acupuncture in AI-induced arthralgia.

1.1.11. Chien 2015

Chien TJ, Liu CY, Chang YF, Fang CJ, Hsu CH. Acupuncture for treating aromatase inhibitor-related arthralgia in breast cancer: a systematic review and meta-analysis. J Altern Complement Med.

2015.21(5):251-260 [183172]

Purpose	Acupuncture has been used as a complementary medical treatment for arthralgia and other types of pain. The objective of this review is to assess the effectiveness of acupuncture in the treatment of arthralgia in patients with breast cancer who were treated with aromatase inhibitors (Ais).
Methods	A literature search was performed, without language restrictions, of 10 databases from their inception through February 2014. The literature reviewed included randomized clinical trials (RCTs) and clinical trials that compared real versus sham acupuncture for the treatment of AI-related musculoskeletal symptoms (AIMSS). The methodologic quality of these trials was assessed by using the modified Jadad Quality Scale. Meta-analytic software (RevMan 5.0) was used to analyze the data.
Results	To compare the effects of real versus sham acupuncture, five RCTs were assessed by meta-analysis and quality analysis. Three of the RCTs reported favorable effects with regard to use of acupuncture in reducing pain and joint-related symptoms, while the other two RCTs did not. The meta-analysis showed trends toward reduced pain and stiffness in patients given acupuncture compared with those who received sham treatment (n=82; pain, mean difference: -2.07 [95% confidence interval (CI), -4.72 to 0.57]; p=0.12; stiffness, mean difference: -86.10 [95% CI, -249.11 to 76.92]; p=0.30), although these differences were not statistically significant.
Conclusions	**Acupuncture has been reported as a safe and promising treatment for AIMSS**, but the present analysis indicated that the effects were **not statistically significant**. Other outcome measurements, such as imaging studies, would be worth including in future studies to further confirm the efficacy of acupuncture in AIMSS.

1.1.12. Halsey 2015

Halsey EJ, Xing M, Stockley RC. Acupuncture for joint symptoms related to aromatase inhibitor therapy in postmenopausal women with early-stage breast cancer: a narrative review. Acupunct Med. 2015;33(3):188-95. [185615].

Objectives	Aromatase inhibitor-induced musculoskeletal syndrome (AIMSS) leads to discontinuation of aromatase inhibitor therapy in a significant proportion of patients with breast cancer. Acupuncture is popular among cancer patients and has previously been shown to improve symptoms in a range of musculoskeletal complaints. AIM: To determine the effectiveness and safety of acupuncture for the management of AIMSS in postmenopausal women with early-stage breast cancer.
Methods	A literature search was carried out for randomised controlled trials (RCTs) on acupuncture for AIMSS in postmenopausal women with early-stage breast cancer. Characteristics of trials and outcomes were extracted from the retrieved articles, which were also assessed for risk of bias and quality of reporting.
Results	**Four RCTs were retrieved of sample size 32-67 (totalling 190 participants).** Compliance with treatment was high and rates of adverse events were low. Of the three two-arm RCTs, two found no difference between acupuncture and sham acupuncture and one found that acupuncture was statistically superior to sham acupuncture. The fourth RCT, which incorporated three arms, found acupuncture and sham acupuncture to be statistically superior to usual care but there was no difference between true and sham acupuncture. Three trials that used non-penetrating sham as the control found no effect of acupuncture over sham, but the one trial that used superficial needle insertion found acupuncture to be superior
Conclusions	**Acupuncture is safe and results in improvement in AIMSS symptoms, but similar benefits are also elicited by non-penetrating sham acupuncture**. Future research should seek to establish the durability of improvements.

1.2. Special Clinical Forms

1.2.1. Hand Arthralgia

1.2.1.1. Muñoz-Bermúdez 2026

Muñoz-Bermúdez N, Abril-Esteban V, Villafañe JH, Bonsfills-García N, Ucero-Lozano R, Del-Barco-Luengo C, Abuín-Porras V. Effectiveness of Non-Pharmacological Interventions for Hormone Therapy-Induced Hand Arthralgia in Breast Cancer Patients: A Systematic Review. J Evid Based Integr Med. 2026;31:2515690×261423036. https://doi.org/10.1177/2515690X261423036

Background	Aromatase inhibitor-induced arthralgia (AIA) is a frequent adverse effect of endocrine therapy in breast cancer survivors, often leading to treatment modification or discontinuation. Non-pharmacological interventions have been proposed to manage AIA, but evidence remains fragmented.
Objective	To synthesize recent randomized controlled trials (RCTs) evaluating the efficacy of non-pharmacological interventions for AIA.
Methods	A systematic search of PubMed, Scopus, and Web of Science identified RCTs published between 2010 and 2025 assessing non-pharmacological strategies for AIA. Two reviewers independently performed study selection, data extraction, and quality appraisal using standardized criteria.
Results	Eight RCTs met inclusion criteria, encompassing interventions such as acupuncture, structured exercise (aerobic, resistance, and Pilates), progressive relaxation, and neuromuscular taping. **Acupuncture** produced clinically meaningful reductions in pain intensity (mean differences 0.9-1.1 points on the Brief Pain Inventory), while exercise programs yielded moderate improvements in pain, function, and quality of life. Relaxation and taping interventions demonstrated smaller or less consistent effects. No eligible trials evaluated occupational therapy-based interventions.
Conclusions	**Acupuncture** and structured exercise show the strongest evidence of benefit for managing AIA, though overall methodological quality remains moderate. Further well-designed trals with standardized outcomes and longer follow-up are needed to guide clinical implementation and to explore underrepresented approaches such as occupational therapy.

2. Overviews of Systematic Reviews

2.1. Kim 2018 ☆

Kim TH, Kang JW, Lee TH. Therapeutic options for aromatase inhibitor-associated arthralgia in breast cancer survivors: A systematic review of systematic reviews, evidence mapping, and network meta-analysis. Maturitas. 2018;118:29-37. [189103].

Background	Aromatase inhibitor-associated arthralgia (AIA) is a common problem in breast cancer survivors and is associated with noncompliance with aromatase inhibitor therapy.
Aim	The aim of this research was to assess the current evidence for the various therapeutic options available for AIA.

Methods	We searched the PubMed, EMBASE, Cochrane Database of Systematic Reviews, and Database of Abstracts of Reviews of Effects for systematic reviews of trials investigating treatments for AIA to June 2018. Eligible systematic reviews were subjected to evidence mapping and the randomized controlled trials included in the systematic reviews were hand-searched for a network meta-analysis.
Results	**Six systematic reviews were included** in the evidence mapping. Acupuncture was the most common treatment modality studied (four randomized controlled trials), and pharmacological interventions, aerobic exercise, Nordic walking, omega-3 fatty acids, and vitamin D were assessed less frequently. In view of the limitations in the overall confidence level for each review, the evidence for acupuncture as an effective treatment for AIA was considered low. Second, data from 6 randomized controlled trials were included in the network meta-analysis. When compared with a waiting list control, acupuncture (mean difference [MD] -2.00, 95% confidence interval [CI] -3.16, -0.84), aerobic exercise (MD -0.80, 95% CI -1.33, -0.016), and omega-3 fatty acids (MD -2.10, 95% CI -3.23, -0.97) significantly improved pain severity scores. Network meta-analysis of adverse events was not possible because of poor reporting.
Conclusions	Acupuncture is presently the most widely investigated intervention but is recommended for AIA with low overall confidence based on the current evidence.

3. Clinical Practice Guidelines

⊕ positive recommendation (regardless of the level of evidence reported)
Ø negative recommendation (or lack of evidence)

3.1. National Cancer Comprehensive Network (NCCN, USA) 2026 ⊕

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Survivorship. Version 2.2026. Plymouth Meeting (PA): National Comprehensive Cancer Network; updated 2026 Apr 8. https://www.nccn.org/professionals/physician_gls/pdf/survivorship.pdf

Acupuncture (category 1 for AI-induced arthralgia)

3.2. International clinical practice guideline 2025 ⊕

Lu T, Lai H, Lin H, Ma F, Hou L, Tang L, Zhu Y, Mao H, Zhang AL, Lee MS, Ozaki A, Schveitzer MC, Zhao H, Zhong L, Jia B, Fan L, Huang J, Han B, Zhao W, Ge L, Liu J, Huang L. Using Integrative Therapies to Improve Patient-Reported Outcomes in Breast Cancer Survivors: A Living Evidence-Based Clinical Practice Guideline. J Evid Based Med. 2025 Jun;18(2):e70029. https://doi.org/10.1111/jebm.70029. https://pubmed.ncbi.nlm.nih.gov/40207746

Recommendation 4.2 Conditional recommendations in favor of **acupuncture** to improve skeletal muscle pain with aromatase inhibitor induced arthralgia in breast cancer survivors (low certainty).

3.3. American Society of Breast Surgeons (ASBS, USA) 2024 ⊕

A Surgeon's Resource Guide to Endocrine Therapy for the Management and Risk Reduction of Hormone Receptor Positive Breast Cancer. 2024.
https://www.breastsurgeons.org/docs/statements/ASBrS-Resource-Guide-on-Endocrine-Therapy.pdf

Musculoskeletal Complaints : Clinical trials have demonstrated the effectiveness of **acupuncture** and duloxetine for managing AI-related arthralgias

3.4. Institut National du Cancer (INC, France) 2023 ⊕

Prévention et gestion des effets indésirables des anticancéreux - Hormonothérapies dans le traitement adjuvant des cancers du sein. Institut National du Cancer. 2023. https://www.e-cancer.fr/Expertises-et-publications/Catalogue-des-publications/Prevention-et-gestion-des-effets-indesirables-des-anticancereux-Hormonotherapies-dans-le-traitement-adjuvant-des-cancers-du-sein

Douleurs articulaires et musculosquelettiques (Inhibiteurs de l'aromatase. Agonistes de la GNRH. Tamoxifène). Discuter les approches non pharmacologiques telles que kinésithérapie, physiothérapie, balnéothérapie, **acupuncture**, techniques de relaxation.

Ref.
- Liu X, et al. Acupuncture for Arthralgia Induced by Aromatase Inhibitors in Patients with Breast Cancer: A Systematic Review and Meta-analysis. Integr Cancer Ther. 2021 Jan-Dec ; 20:1534735420980811
- Hershman DL, et al. Effect of Acupuncture vs Sham Acupuncture or Waitlist Control on Joint Pain Related to Aromatase Inhibitors Among Women With Early-Stage Breast Cancer: A Randomized Clinical Trial. JAMA. 2018 Jul 10 ; 320(2):167-176

3.5. American Society of Clinical Oncology / Society for Integrative Oncology (ASCO/SIO, USA 2022) ⊕

Mao JJ, Ismaila N, Bao T, Barton D, Ben-Arye E, Garland EL, Greenlee H, Leblanc T, Lee RT, Lopez AM, Loprinzi C, Lyman GH, MacLeod J, Master VA, Ramchandran K, Wagner LI, Walker EM, Bruner DW, Witt CM, Bruera E. Integrative Medicine for Pain Management in Oncology: Society for Integrative Oncology-ASCO Guideline. J Clin Oncol. 2022 Sep 19:JCO2201357. https://doi.org/10.1200/JCO.22.01357

Aromatase inhibitor–related joint pain.*Recommendation* 1.1. Acupuncture should be offered to patients experiencing AI-related joint pain in breast cancer (Type: Evidence based, benefits outweigh harms; Evidence quality: Intermediate; Strength of recommendation: Moderate).

3.6. International Trustworthy traditional Chinese Medicine Recommendations (TCM Recs) Working Group (2022) ⊕

Ge L, Wang Q, He Y, Wu D, Zhou Q, Xu N, Yang K, Chen Y, Zhang AL, Hua H, Huang J, Hui KK, Liang F, Wang L, Xu B, Yang Y, Zhang W, Zhao B, Zhu B, Guo X, Xue CC, Zhang H. Acupuncture for cancer pain: an evidence-based clinical practice guideline. Chin Med. 2022;17(1):8. [219467]. doi

We recommend the treatment of acupuncture rather than no treatment to relieve pain in breast cancer patients with aromatase inhibitor-induced arthralgia (strong recommendation, low certainty evidence).

3.7. National Cancer Comprehensive Network (NCCN, USA) 2022 ⊕

NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) Survivorship Version 1.2022. National Cancer Comprehensive Network. 2022. 285P. [170072]. https://www.nccn.org/professionals/physician_gls/pdf/survivorship.pdf

Myalgias, arthralgias : acupuncture (category 1 for AI-induced arthralgia).

3.8. Association of the Scientific Medical Societies in Germany (AWMF), German Cancer Society (DKG), German Cancer Aid (DKH) 2021 ⊕

Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften e.V. (AWMF), Deutschen Krebsgesellschaft e.V. (DKG) und Deutschen Krebshilfe (DKHS). 3-Leitlinie Komplementärmedizin in der Behandlung von onkologischen PatientInnen. 2021. https://www.leitlinienprogramm-onkologie.de/leitlinien/komplementaermedizin/

Acupuncture. Recommendation strength: **Should**. Patient context: Breast cancer patients. Note: Joint pain from aromatase inhibitors.

3.9. National Cancer Comprehensive Network (NCCN, USA) 2020 ⊕

NCCN Guidelines for Supportive Care : Adult Cancer Pain. National Cancer Comprehensive Network. Version 1.2020.99P. doi

Acupuncture (category 1 for AI-induced arthralgia)

3.10. Spanish Society of Medical Oncology (SEOM, Spain) 2018 ⊕

Barnadas A, Algara M, Cordoba O, Casas A, Gonzalez M, Marzo M, Montero A, Muñoz M, Ruiz A, Santolaya F, Fernandez T. Recommendations for the follow-up care of female breast cancer survivors: a guideline of the Spanish Society of Medical Oncology (SEOM), Spanish Society of General Medicine (SEMERGEN), Spanish Society for Family and Community Medicine (SEMFYC) et al. Clin Transl Oncol. 2018;20(6):687-694. [175865].

Joint pain: Acupuncture can be beneficial.

3.11. Arbeitsgemeinschaft Gynäkologische Onkologie (AGO, Allemagne) 2018 ⊕

Diagnosis and Treatment of Patients with Primary and Metastatic Breast Cancer. Complementary Therapy Survivorship. Arbeitsgemeinschaft Gynäkologische Onkologie (AGO). 2018;:35P. [182073].

Acupuncture in order to improve Aromatase-inhibitor— induced athralgia: Level of evidence 1b (individual RCT), grade of evidence (B), AGO recommendation grade (+)
(+) This examination or therapeutic intervention is for the patient of limited benefit and can be performed.

3.12. American Cancer Society/American Society of Clinical Oncology (ACS/ASCO, USA) 2016 ⊕

Runowicz CD, Leach CR, Henry NL, Henry KS, Mackey HT, Cowens-Alvarado RL, Cannady RS, Pratt-Chapman ML, Edge SB, Jacobs LA, Hurria A, Marks LB, LaMonte SJ, Warner E, Lyman GH, Ganz PA. American Cancer Society/American Society of Clinical Oncology Breast Cancer SurvivorshipCare Guideline. J Clin Oncol. 2016;34(6):611-35. [198256].

Musculoskeletal health Recommendation 3.8: It is recommended that primary care clinicians (a) should assess for musculoskeletal symptoms, including pain, by asking patients about their symptoms at each clinical encounter (LOE 5 0); and (b) should offer one or more of the following interventions based on clinical indication: **acupuncture**, physical activity, and referral for physical therapy or rehabilitation (LOE 5 III).

3.13. Association Francophone des Soins Oncologiques de Support (AFSOS) 2014 ⊕

Association Francophone des Soins Oncologiques de Support (AFSOS). Fiches Réferentiels : L'acupuncture en onco-hématologie MAJ 2014 (online)

Arthralgies sous anti-aromatases : acupuncture (niveau de preuve HAS : B)

4. Randomized controlled trials

4.1. Sources

Systematic reviews and guidelines for a listing of randomized control trials included:

1. **Qi 2022**: Qi QL, Han X, Tang C. Effects of Acupuncture on Breast Cancer Patients Taking Aromatase Inhibitors. Biomed Res Int. 2022 Sep 12;2022:1164355. https://doi.org/10.1155/2022/1164355
2. **Liu 2021**: Liu X, Lu J, Wang G, Chen X, Xv H, Huang J, Xue M, Tang J. Acupuncture for Arthralgia Induced by Aromatase Inhibitors in Patients with Breast Cancer: A Systematic Review and Meta-analysis. Integr Cancer Ther. 2021. [217092].
3. **Zhu 2021**: Zhu XY, Li Z, Chen C, Feng RL, Cheng BR, Liu RY, Wang RT, Xu L, Wang Y, Tao X, Zhao P. Physical Therapies for Psychosomatic Symptoms and Quality of Life Induced by Aromatase Inhibitors in Breast Cancer Patients: A Systematic Review and Meta-Analysis. Front Oncol. 2021 Nov 12;11:745280. https://doi.org/10.3389/fonc.2021.745280
4. **Chen 2017**: Chen L, Lin CC, Huang TW et al. Effect of acupuncture on aromatase inhibitor-induced arthralgia in patients with breast cancer: A meta-analysis of randomized controlled trials. Breast. 2017;33:132-138. [186564].
5. **Yang 2017**: Yang GS, Kim HJ, Griffith KA, Zhu S, Dorsey SG, Renn CL. Interventions for the Treatment of Aromatase Inhibitor-Associated Arthralgia in Breast Cancer Survivors: A Systematic Review and Meta-analysis. Cancer Nurs. 2017;40(4):e26-e41. [171528].

4.2. List

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2019	Li J, Huang M, Lin M, et al. [Clinical effect of Canggui Tanxue acupuncture at ashi point in the treatment of muscle, bone and joint pain induced by aromatase inhibitor of breast cancer]. China Med Herald 2019;16:132-135.	Liu 2021
2018	Hershman DL, Unger JM, Greenlee H, Capodice JL, Lew DL, Darke AK, Kengla AT, Melnik MK, Jorgensen CW, Kreisle WH, Minasian LM, Fisch MJ, Henry NL, Crew KD. Effect of Acupuncture vs Sham Acupuncture or Waitlist Control on Joint Pain Related to Aromatase Inhibitors Among Women With Early-Stage Breast Cancer: A Randomized Clinical Trial. JAMA. 2018 Jul 10;320(2):167-176. https://doi.org/10.1001/jama.2018.8907.	Qi 2022, Liu 2021 Zhu 2021

	RCT	Sources
2015	Ye J, Wang B, Lv XA, et al. [Clinical study of acupuncture intervention in muscle, bone and joint pain caused by aromatase inhibitors in the treatment of breast cancer]. Shanghai J Acup Moxib 2015;34:642-646.	Liu 2021
2014	Bao T, Cai L, Snyder C, Betts K, Tarpinian K, Gould J, Jeter S, Medeiros M, Chumsri S, Bardia A, Tan M, Singh H, Tkaczuk KH, Stearns V. Patient-reported outcomes in women with breast cancer enrolled in a dual-center, double-blind, randomized controlled trial assessing the effect of acupuncture in reducing aromatase inhibitor-induced musculoskeletal symptoms. Cancer. 2014 Feb 1;120(3):381-9. https://doi.org/10.1002/cncr.28352	Qi 2022 Zhu 2021
	Bauml J, Xie SX, Farrar JT, Bowman MA, Li SQ, Bruner D, DeMichele A, Mao JJ. Expectancy in real and sham electroacupuncture: does believing make it so? J Natl Cancer Inst Monogr. 2014 Nov;2014(50):302-7. https://doi.org/10.1093/jncimonographs/lgu029	Qi 2022
	Mao JJ, Farrar JT, Bruner D, Zee J, Bowman M, Seluzicki C, DeMichele A, Xie SX. Electroacupuncture for fatigue, sleep, and psychological distress in breast cancer patients with aromatase inhibitor-related arthralgia: a randomized trial. Cancer. 2014 Dec 1;120(23):3744-51. https://doi.org/10.1002/cncr.28917	Qi 2022, Zhu 2021 Chen 2017
	Mao JJ, Xie SX, Farrar JT, Stricker CT, Bowman MA, Bruner D, DeMichele A. A randomised trial of electro-acupuncture for arthralgia related to aromatase inhibitor use. Eur J Cancer. 2014 Jan;50(2):267-76. https://doi.org/10.1016/j.ejca.2013.09.022	Qi 2022, Liu 2021 Chen 2017 Yang 2017
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