Alaska Care is currently my secondary coverage for prescriptions (primary is federal employees retirees coverage, FEP 105 through Blue Cross). Blue Cross just advised me that the coordination of benefits will change, and the EGWP will then become my primary prescription coverage.

Do you agree with their assessment?

The change, if it occurs, is fine with me as long as a national pharmacy chain, like Walgreens, will accept the change (they do accept the current AlaskaCare coverage).

Do you anticipate that the new Medicare part D plan will be widely accepted in Seattle?

John Morrell
I'm a Medicaid eligible retiree under the DB plan. I get one of my prescriptions from the Aetna Specialty Pharmacy. How will the change to the Enhanced EGWP effect my access to this medication? Richard I'll.

Sent from Yahoo Mail on Android
1) Oh My Goodness - look at the reviews of the new PBM by respected websites:

https://www.consumeraffairs.com/rx/prescription_solutions.html

https://www.law.com/ctlawtribune/2018/03/14/class-action-moves-forward-against-cigna-for-alleged-prescription-drug-overcharging/?slreturn=20180723142658

https://community.aarp.org/t5/Medicare-Insurance/DO-NOT-USE-OPTUMRx-to-fill-or-refill-your-prescriptions/td-p/85244

https://www.yelp.com/biz/optum-rx-sugar-land

http://www.pharmaciststeve.com/?p=24318

among the many. Nothing above a one star rating. Could not have selected a worse provider

2) I am maxed out of Medicare surcharges - I cannot understand how the State of Alaska is going to save money on my account. My understanding from the Townhall meeting is the State will reimburse me $75 / month for these surcharges. Also it was not clear if the $75 were for a family or for each member of a family. If the later, would be a significant cost to the state on my behalf.
I agree with the members who have asked for inclusion of preventive coverage, including vaccines, in our health benefits. Preventive measures are less costly and unpleasant for people than going through the illness that is being prevented. Being retired means a fixed income where a colonoscopy, shingles or flu vaccines, a hepatitis screening are not things that fit into our budgets. We have worked many years to receive our health benefit, for which we pay a monthly premium, it should include coverage preventive measures.
To whom it may concern,

As a retired person who is over 65, I would like to officially state that I am against this EGWP change. I DO NOT WANT TO HAVE THE FEDERAL GOVERNMENT DEALING WITH MY HEALTH INSURANCE PROGRAM THAT I PAID INTO FOR MANY YEARS. I do not need this problem at this point in my life. Rather than to single out all the old folks, how about, as of a certain date, these people be grandfathered into the old system.

Having to appeal with a 3 or 5 step process, could mean a person may die before it gets through the whole ordeal. The most obvious gap created by switching to the EGWP is the appeal process. Under the current RDS program, members are entitled to utilize a statutory three-step appeal process that allows a final review by Alaska courts, while the EGWP requires a member to utilize a cumbersome five-step appeal process under federal regulations with final review in federal court. In addition, EGWP is a federal program that could be modified, suspended or terminated at any time.

As noted above, EGWP requires members to follow federal regulations rather than current plan language, eliminates the plan statutory appeal process and changes the plan fiduciary from DOA to the PBM.
Without greater specific benefit usage data provided by DOA, it is difficult to determine what other benefits under the current plan are restricted, reduced or eliminated. Again, as a federal program EGWP could be suspended, modified or terminated at any time.

I am not interested in this cumbersome idea, absolutely NOT INTERESTED.

JUDITH A KEARNS-STEFFEN
Denise Drake wanted to share this opinion to the board:

In regards to the medical dependent age being 23, she would like for it to be moved to age 26.

Vanessa Kitchen
Administrative Assistant
Department of Administration
Commissioner's Office
907-269-6293
My wife is currently using the long term benefits. In her initial evaluation she was found edible for up to 8 hours a day 7 days per week. As of now the max the policy will pay is 125.00 per day. The hourly rate in Alaska is 25.00 per hour. We are currently in Az and the rate here is 23.00 dollars per hour. As you can see the most she can get without having to come out of her own pocket is 5 hours.

I suspect it has been some time since that rate was set please consider raising it to 175.00 per day.

That you for your consideration

Please let me know what you think.

Albert and Linda Patterson
To Whom This Concerns

I just learned that the State has elected to change our drug plan from self administered to using a Medicare Part D contractor. If I understand the changes correctly, I have at least two major problems with the change to our drug plan.

My first problem is related to benefits under our medical plan. While it is not directly related to the drug benefits, it highlights my concerns about changing to the “federal” plan process. Every time we have changed our medical plan Third Party Administrator (TPA), I have had problems with benefits. In some cases I had to contact Benefits for resolution. For example, I went to a Chiropractor and the TPA said it was not covered. I contacted Benefits and problem was resolved.

Another example recently was related to dental benefits. Our benefits say we can have two cleanings every year. Moda said the cleanings had to be exactly 6 months apart. It is not always possible to guarantee a visit to the dentist exactly 6 months apart. I was traveling and my schedule resulted in a one month delay which meant the next cleaning was only 5 months after the previous cleaning. I contacted Benefits and problem resolved.

There have been other instances over the past 30 years. Resolution has always been simple and easy. Under the federal process this is not the case. Processing time of claims under Medicare are not timely. There is no guarantee that claims would happen timely under a Medicare Part D contractor, and the process is long and frustrating to appeal a decision.

The second problem has to do with the contractor requiring an alternative generic drug. I have had medical issues that have not always responded to some drugs that work for others. In all cases my doctor issued a prescription and generic drugs were dispensed by the pharmacy. My numbers did not always respond to the prescribed drugs. We have now found a drug that works.

To have someone sitting in an office somewhere who does not have specific knowledge of my medical issues and responses to drugs is of great concern. To have to then undertake the cumbersome federal process to resolve the administrator’s choice could effect my heath.

In short, over the past 30 years, there have been issues with every TPA. Retirement and Benefits has always been able to resolve issues timely. This change, in my mind, abdicates some of the decision making responsibilities to a process that is long and cumbersome, with no guarantees that Retirement and Benefits can assist in a timely manner.

Ron King

Sent from my iPad
When I looked at joining the Alaska State Troopers in January 1973, the pay wasn’t much compared to the wages I was making at the time. However, I looked at the benefits during employment and after I retired. I gave the State 26 years and did my best to fulfill my contract or obligations I was committed too.

Now, it seems all the benefits pertaining to our health from dental to vision is being reduced or completely removed. That was not I signed on for and have expectation of retaining what was in writing at the time I retired and not be removed or traded off.

Regards
........... Brad

Brad Brown
It would be nice (and a significant cost savings) to add stem cell transplants to the approved procedures for our insurance.

Thank you,

Mari Auxier
RE: AlaskaCare EGWP Program – Observations / Commentary Requests

To: Leslie R idle, Commissioner, Dept. of Administration
   All Members of The Alaska Retirement Management Board
   Ajay Desai, Division Director, Retirement & Benefits
   Michele Michaud, Chief Health Official
   Emily Ricci, Chief Health Policy Official

CC: Governor Bill Walker

RE: Employer Group Waiver Program (EGWP)
    Tele Town Hall, Thursday, Aug. 23, 2018 10:00 am to 11:00 am

For MOST retirees and plan members of PERS and TRS, they were first actually practically made aware of the “New Program, Same Pharmacy Benefits (self-proclaimed lead in, emphasis provided)” (EGWP) program by a mailing about a week or two before Thursday, August 23, 2018 Tele Town Hall meeting.

However, the most common form of communication to the vast majority of plan members, system-wide, the June 2018, Number 118, PERS Newsbreak, contained not a single mention or piece of information on this new program whatsoever to alert the membership about this program. (Although, as Emily stated in the Tele Town Hall, this has been worked on since February, 2018 – SIX full months before).

=====

“SAME” is defined in the dictionary as: “identical, NOT different” and “of an identical type; EXACTLY similar”. (Definition retrieve in Google search, emphasis provided through highlight, retrieved 2018-08-28.)

Any modification, and that includes changing a medication through the use of a “New Program” introduced pre-authorization criteria, or a new prescription, that now is subject to new OptumRx medication changes criteria – “that it would not have been under the existing prior plan” – is NOT THE “SAME Pharmacy Benefit”; it is NOT “identical”. It has been converted and made different.

“SAME” may be a semantic word game for bureaucratic administrators, politicians, and Board members – that is not so with the people they are supposed to serve – the patient members of the AlaskaCare health plan and the physicians and providers that are subject to the wishy-washy multiple embedded / implied / assumed interpretations hidden from the members in plan sales materials.

=====
RE: AlaskaCare EGWP Program – Observations / Commentary Requests

As this new program, irrespective of the absolute jumble of conflicting information in the August two-page announcement, contains major embedded stealth changes that will be apparent as the new program is executed to a pharmacy benefits program that affects 10’s of thousands of members, retirees, and active members of AlaskaCare -- I decided to sign-up for the Tele Town Hall.

The result, 1,100 members signed up and about 15-20 got to ask generalized questions – that were all basically unanswered with actual factual information - except for soothing sales talk like answers - that it’s all going to be OK; this is only an administrative change, no real paperwork needed, all is fine – literally; and that for anybody that listened in it sounded like some Disney movie presentation.

FAR FROM IT; if you bother to dig even a little bit further.

It was obvious that so many signed up because this is the first they heard about it, and they realized their gut feeling, from years of having to deal with Aetna RX, led them to the belief that the whole pharmacy benefit and administration would change. That they could be massively negatively affected. Their gut instincts are “spot-on”.

=====

Does this seem plausible to you?

According to the R&B’s sales pitch August two-page mailer and the Town Hall responses:

Someone, Medicare related, is going to give the plan $20 million per year in savings / reimbursement, AND $40-60 million ANNUALLY (that amounts to $100’s of millions over the 25 year projection period) is going to be saved from the unfunded liability – and NOTHING is required to change. This is an administrative only change, and you all get to keep the same (“identical”) benefits (and that means the “identical” drugs by implication) – that other Medicare plan users can’t get?

That you get a NEW PHARMACY PROGRAM, A NEW PHARMACY BENEFITS MANAGER – with the SAME (IDENTICAL) PHARMACY BENEFITS? Absolutely no change, all positive – NO downside whatsoever!

Sounds too good to be true – It is!

And if it is true, then why on earth did the State / politicians / Comm. Of Administration / Plan Director / Chief Health Officers / Board – not adopt this plan many years ago when it was already available. Ignoring their collective legal responsibility to the AlaskaCare Trust by giving up hundreds of millions of dollars needlessly for the plan?
Using such a forum, and prior ARMB meeting commentary, to call it all practically valid “public input” is simply disingenuous, misleading, outright misinformation and DIS-information.

As the one-hour meeting wore on, finally came up, as was indicated on the notice that AlaskaCare is “considering” this new plan. *Even though 99.9% of the document’s contents presents it as a done deal with zero downside.*

Why would you be “considering” such a plan, and not have implemented it for the past many years since it has been available, if you got a lock on $20 million + $40-60 million – PER YEAR – for the SAME Pharmacy benefits – absolutely no downside --- and it was available all that time?

That would be the height of *managerial malfeasance in office,* by both the Plan, it’s Plan Administrator, it’s management, the Board, the leadership of the Dept. of Administration - not to have done this years ago – if it was all simply available – and nothing really changed!? So the State / Admin / R&B / The Plan gave up hundreds of millions in savings because it just now thought of “considering” this program?

The answer is – there is a MAJOR change to the actual pharmacy benefit, it is NOT as presented actually, in implementation, “identical”; there has to be major reasons, in all practicality, that this was not done.

=====

Someone needs to forthright and HONEST with the membership as to exactly what the CATCH is, what is actually going to happen in implementation reality— OR – explain why the Plan gave up hundreds of millions in savings and unfunded liability costs these past years since the Plan itself ASSERTS there is / was never a change or downside in benefits to the members?

=========

This is what I found after ten hours of detailed research, consideration, and this writing. 99.99% of members don’t have the time, background, and experience to do that – they rely on the Board and the Division to do this work.

My work hardly touches the surface of the incredible depth of material that might be available – but is completely glossed over in asserting to the membership that this is the “SAME Pharmacy benefit” in reporting to the membership.
RE: AlaskaCare EGWP Program – Observations / Commentary Requests

The search and work I did hardly scratches the surface of the material – and yet, the State / Comm. Of Administration / The Director-Plan Administrator / The various Chief Health Officials and Policy makers – certify in their talk to the members they can make an informed decision WITHOUT going over the same thousands of pages they supposedly reviewed. That all the membership will find is a “NEW PROGRAM – SAME (IDENTICAL) Pharmacy Benefits”.?! 

How is that even possible when there are THOUSANDS of pages of material that have been supposedly considered by State / Plan officials and Board members. 

You mean I’m supposed to believe there are NO SUBSTANTIVE CHANGES WHATSOEVER, plus hundreds of millions of dollars given to the plan in savings — if one reviews THOUSANDS of pages of documents made to support a decision? 

*If you actually propose that I can be thoroughly confident that you are 100% correct, and even you believe that, then I have a bridge in Alaska to sell you….*

===== Search for EGWP Documents on Plan Website =====

I conducted two searches on the RetBen website for EGWP.  
  one - “EGWP documents used by board”,  
  second - “EGWP Documents used by Board to consider proposal”

Each only produced FOUR total hits, only TWO related to EGWP. In total they disclosed THREE related items, although either search produced different results.

A 2018-06-12 Retirement Health Plan Advisory Board Modernization Committee (RHPAB) document on EGWP.  
  A document that is 118 pages long, w/o the attachments referred to which would greatly increase the material.

A 2018-07-26 Retirement Health Plan Advisory Board Modernization Committee (RHPAB) document on EGWP.  
  A document that is 75 pages long, w/o the attachments referred to which would greatly increase the material.

A 2018-08-09 Retirement Health Plan Advisory Board Modernization Committee (RHPAB) document on EGWP.  
  A document that is 426 pages long, w/o the attachments referred to which would greatly increase the material.

These searches alone uncovered 619 pages of material, without the attached supplemental documents included; which would have added many more.
It is patently absurd to assert that nothing, in what is surely thousands of pages of Board material and attachments, contain NO substantive change to the pharmacy benefit whatsoever – at increased benefits in dollars to the plan (that have here to fore been ignored and given up because you didn’t get around to it !?).

==== The “Pre-Authorization” SCAM ====

The healthcare sales piece for the Town Hall meeting mentions:

(Clip art Stethoscope - cute) “Some retirees would need new pre-authorizations for current prescriptions. If an enhanced EGWP is adopted, talk with your doctor and our new Pharmacy Benefit Manager later this year: they are pre-authorization pros and will work with you to get the paperwork taken care of.”

Anyone who has ever dealt with completely murky process of “pre-authorization” on pharmacy benefits (or any other pre-authorization denial and appeals process) knows the absolute landmine and paperwork blizzard that is coming; and the thoroughly NON-responsive ness of Aetna (present PBM / TPA), and the passive response of the health officials at DRB.

This the key to what is modern STEALTH healthcare administration – “The Hassle Factor” They hassle you until you give up.

Pre-authorization will force the inevitable result in many medications being denied or changed to less effective alternatives – solely based on financial consideration – not medical efficacy or patient-doctor interaction. But squarely blamed on the physician or provider – who will be left to fight it out with the patient - when it was purposely and actually forced by the PBM and Plan.

Like the new “opioid” medically criminalized approach, pre-approval process - which is a CDC guideline, and NOT some established rule – a method to make MD’s fear for their licensure and career – so they will be forced not to prescribe what they believe to be medically necessary for patients in real life pain. These MDs shut down simply to get away from unwarranted government direct intrusion in the healthcare decisions.

This precisely what this “New Program” initiative is replicating, instituting – and INTENDED to do. The Health Officials at DRB are directly intruding and interfering with medical doctor-patient decision making.

The supposed “pre-authorization pros...” are little more than “PRO” CORPORATE CLERICAL gatekeepers, working from CORPORATE SCRIPTS, to hassle physicians to fill out paperwork, knowing that many will simply give up or prescribe something other than what is their actual medical opinion first choice.
Leaving the patient to blame their own doctor who is little more than caught in the middle.

A review of the proposed PBM’s (OptumRX) website indicated no less than 715 separate forms, covering each of 715 separate medications that required extensive preauthorization information. A separate form for each. There was also a General Form when a drug-specific form was not available – from the 715 above. A special “Dispense as Written” form was also available.

For me and my spouse no less than SEVEN specific new pre-authorization forms would have to be filed. I have no doubt there will be thousands of retirees and hundreds of doctors in the same situation.

But then that’s the true purpose of this “new program”. And that’s how savings are made – by cutting out what was originally supplied under medical necessity.

Unless 100% of those “pre-authorizations” are approved then this is most certainly NOT the “Same (IDENTICAL) Pharmacy Benefits.”

*Nothing more than an stealth underhanded administrative paperwork blizzard to alter / change the pharmacy benefits we now receive.*

Therefore, the clear and unambiguous presentation by the State / Comm. Of Administration / Plan Administrator / Director / Chief Health Officials – is no more than a plausible deniability assertion that it’s the “Same (Identical) Pharmacy Benefits” – when nothing of the sort will actually come out of the implementation. It is little more than a total semantic OVERT misrepresentation and DIS-information – with the purpose to keep the membership from negatively commenting on what the Plan already wants to do.

*I felt it important that this gets ON THE RECORD to show what the self-dealing State Health Officials, and their superiors, are trying to sell to the membership under the cloak of some feigned benign change.*

=====

We all know that drug prices are completely out of control, caused mainly by unregulated drug companies and a super complex cost / profit / percentage / kickback formulation concocted by the drug industry and PBMs. This has been well reported upon by the National press. It’s not “fake news”; not even to Donald Trump!
RE: AlaskaCare EGWP Program – Observations / Commentary Requests

One only needs the example of the Mylan EpiPen saga, where a life saving critical medication was increased from $57 to $600 in less than ten years to know that this was not an outlier incident. That drug prices have been massively increased and rebates / kickbacks / contracts / secretive profits applied / charged / and specialty contracts used to charge consumers and plan ridiculous amounts for drugs.

The PBM dazzles the plan with “savings” though a grinding ‘pre-authorization” routine that no doubt will show “savings” - that are both speculative, unsupported by actually fact auditing or verifiable financial statements of actual PBM dealings that are available to the members, and wildly made claims by Plan Administrators --- while the membership, and their trusted doctors, still get screwed and blamed for utilization.

Again, that’s how healthcare in reality actually works – “THE HASSLE FACTOR”. We hassle you long enough that you will give in, while the PBM walks off with the massive secretive embedded kickback profits, never disclosed to the plan, which are charged to the plan. Yet embedded in their “contract” because of their own kickback arrangements with the drug companies, of being the plan’s drug dealer / intermediary. Nothing fancy here or conspiratorial – just how the pharmacy business works in reality.

=====

There is only one way to prove this whole “SAME” (IDENTICAL) plan to me.

Place side-by-side for each and every member their present medications to date – and compare that to the drugs ACTUALLY allowed, without pre-authorization paperwork changes enforced, in the New Plan. THAT would be the SAME (IDENTICAL) Pharmacy benefit.

Also, what happens when the current prescription is over. If a renewed prescription is made is it now subject to the total change of pre-authorization? That is N O T the SAME Pharmacy benefit plan, but a changed and different one if a new drug is mandated by the formulary.

I realize this will be hard to do because Aetna’s own past PBM web pharmacy records regularly change as to what was the supposed content - and are often wildly inaccurate – based on actual personal experience.

=====

This is NOT the “Same Pharmacy Benefits” after switching to OptumRX. It can’t possibly be that way because there are enough forced medicine changes that will take place that members will no longer have the same benefits, actually.
I understand the Plan's problem. With the CVS / Aetna merger there are only two major PBM's in the country; and a bunch of minor ones.

With the Aetna/CVS and OptumRx being the only big players – the monopoly prices can and will only eventually go up – literally wiping out all the savings in cost and unfunded liability savings, eventually. So how do you save money from what is obvious monopoly economics?

By the way, I would like the exact documents that calculated the Annual savings of $20 million and the $40-60 million unfunded liability savings; proffered to be for each and every year.

=====

As a CPA, a forensic investigator instructor myself, and former CFO in a hospital, and a former CFO of the Division of Retirement & Benefits for over a decade - I would be fascinated to dig into how your actuaries / consultants came up with this.

To create a “New Program, SAME (IDENTICAL) Pharmacy Benefits” – with hundreds of millions of dollars in Trust savings and cash benefits - over the 25-year actuarial projection period saved. **Certified by the State, Board, the Plan Administrator, and Chief Plan Healthcare Officials to the membership.**

Truly an amazing and miraculous outcome!

=====

I await your answer so all Plan Members can share, on an actual factual basis, this marvelous find of only upside, with no changes required by members or their physicians in the “SAME (IDENTICAL) Pharmacy Benefits”.

Also then, by all means explain why Retirement & Benefits, DOA, the Walker Administration, and the professional consultants and actuaries used by the plan - **did NOT take advantage of this program, which was available years ago**, and garner for the AlaskaCare TRUST, if it is as you now say $60+ millions **per year in annual savings**, which easily amounts to hundreds of millions of dollars to the Trust, with NO change in benefits to members – just because you were **tied to an AetnaRx contract – and therefore had to give Aetna many untold millions in what would have been pure profit at the expense of the Trust.**?

I don’t “get it”. Please explain with clarity and factual information so we can determine if the Division and its consultants and actuaries acted in a proper manner for the plan while AetnaRx was under contract in this regard.
Kathie Livesley

August 22, 2018

Alaska Department of Administration
Division of Retirement and Benefits
PO Box 110203
Juneau, AK 99811-0203

Retiree Health Plan Advisory Board
c/o Alaska Department of Administration, Division of Retirement and Benefits
PO Box 110203
Juneau, AK 99811-0203

Gentlepersons:

I submit the following concerns regarding (1) the AlaskaCare switch to OptumRx as the new benefit manager and (2) the possibility of AlaskaCare retiree pharmacy coverage changing to an EGWP.

I received a flyer from you last week wherein you claim that, “[T]he retiree health trust would receive much higher subsidies than we do today for the same benefits.” I believe this statement may or may not be true in 2019. My reason is that the House of Representatives has already prepared a 2019 budget that proposes to cut $537 billion from Medicare over the coming decade. (https://www.washingtonpost.com/news/business/wp/2018/06/19/house-gop-plan-would-cut-medicare-social-security-to-balance-budget/?noredirect-on&utm_term=.f323f582b9e7). While the budget does not specifically state that EGWP subsidies are to be cut, there are no specifics and the actual cuts will be determined if the bill is passed. Both the House and Senate have made it abundantly clear that they intend to pay for the $1 trillion tax cut by eliminating “entitlements” like Medicare. Additionally, over the last eighteen months, when House bills have failed, the Administration has taken it upon itself to implement cuts via executive order and presidential memoranda directions to the various departments. Congress has in the past threatened to revoke state subsidies on more than one occasion relative to the Affordable Care Act if States did not take certain steps; there is no guarantee that such tactics would not be employed when it comes to Medicare subsidies. At the very least, with such huge cuts to Medicare on the horizon, the State of Alaska could almost certainly expect to pay increased deductibles and copays under EGWP with the same amount of subsidy. Given the current uncertainty in our government, it seems irresponsible to rely on current subsidies as being “written in stone” for any future period.

While the State believes that the switch to an EGWP will provide funds to sustain pharmacy benefits into the future, I have read that Medicare Advantage plans have already seen changes to their EGWPs and the driving force appears to be the cost of PPO vs HMO plans, the former costing more than the latter. Since our plans are all PPOs, it seems reasonable to expect that a change to the AlaskaCare subsidy might also be on the horizon.
Making this switch during these uncertain times will be guaranteeing nothing more than huge out of pocket administrative expenses in making the initial change, setting up the new manager, and possibly going through the entire process again should the House bill pass.

Speaking of additional expenses, the fact that the EGWP requires more pre-authorizations, and the fact that the State will be coordinating benefits between Medicare, known for its delayed processing and complexity, will only ensure additional administrative costs. On top of this, we all know how frequently “uncommon” circumstances popup in Alaska when it comes to medical care, another source of administrative expenses. I find it hard to believe that you will not face immediate backlash and requests for increased payments from your new manager, OptumRx.

I did a little research into OptumRx; they have a reputation for bad training, slow processing, and denying benefits without appeal. Appeals are another administrative expense I predict will exceed your current expectations. Below are screenshots of two review sites and the summaries of their users reviews of OptumRx for your perusal; the source web addresses are shown in the images; a rating of 1 out of 5 from hundreds of reviewers is pretty bad:
A review of the individual submissions shows that the same issues pop up over and over again, year in and year out, and that OptumRx does not provide enough training for their agents to assist customers in a timely fashion.

I have additionally found (from the Medicare website) that under EGWPs the Government does not require a plan administrator to certify creditable coverage of the plan or disclose it to participants, submit enrollment information for retirees, submit aggregate data about drug costs or reconcile them at the end of the year, nor does it require the administrator to comply with federal guidelines or auditing standards, complete a financial reconciliation, determine calendar/non-calendar deadlines, obtain information on rebate payments, complete claims adjustments, or ensure financial eligibility submission is complete and up-to-date. This all seems to leave the door wide open for OptumRx to work non-transparently without accountability to anyone.

I have reviewed your FAQs about this possible change on the Division’s website. Your Item B, under “General Questions” on the Division’s website at http://doa.alaska.gov/drb/alaskacare/retiree/faqs/egwpfaqs.html, regarding why the State feels it appropriate to change retiree pharmacy coverage to Medicare Part D states, “Alaska law already requires that for Alaska retirees...Medicare become the primary coverage for major benefits once they are Medicare eligible. As a Medicare Part D plan, an EGWP would follow this same statutory requirement.” This is untrue. The State has always required Medicare eligible persons to enroll ONLY in Medicare Parts A and B, and has always told us that we need not enroll in Part D:

You are not required to enroll in Medicare Part D as the drug coverage benefits you have through your AlaskaCare Retiree plan are at least as good as the required benefits offered under Medicare Part D. By not enrolling in Part D, you can avoid unnecessary premiums and coordination between Medicare and AlaskaCare for your prescription drugs.
(Emphasis added; source: 08-20-18, http://doa.alaska.gov/drb/alaskacare/retiree/faqs/retireeGeneralFaq.html#medicare)

Your FAQ Item 10 states you will “evaluate whether it is in Alaska’s best interest” in the future; I ask that you stop and make that evaluation, again, now.

Thank you for your consideration.

Sincerely,

Kathie Livesley

cc: via email to AlaskaRHPAB@alaska.gov.
Good Morning,

Please see below.

Kind Regards,

Blayne Hildebrand  
Retirement & Benefits Technician II  
State of Alaska – Dept of Administration  
Division of Retirement and Benefits  
PO Box 110203, Juneau, AK 99811-0203  
Phone: (907) 465-4460  
FAX:   (907) 465-3086  
Toll-Free: 1-800-821-2251

From: Dee Branshaw  
Sent: Tuesday, August 28, 2018 1:07 PM  
To: Benefits (DOA sponsored) <doa.drb.benefits@alaska.gov>  
Subject: Enhanced EGWP

Greetings

I just received the newsletter informing me of the proposed Enhanced EGWP for Alaska retiree's on AlaskaCare.

Since the time has passed for my input on the August Town Hall I am writing to voice my strong opposition to this proposal. It seems that the SOA has already been in contract with the current retiree's for their pharmacy benefits.

It would seem a breach of contract for the SOA to force current retiree's to be forced onto Medicare Part D and an invasion of our privacy regarding our income levels that would incur monies out of pocket for some retiree's when we
are already on a fixed income and then do much more administrative requirements to get reimbursed from the SOA.

One thing that retiree's seem to pull away from as we age is the effort needed to keep on top of the paperwork nightmare associated with the federal government. I do not think the SOA can put this on to current retiree's without breach of contract. I am fully in opposition to this one more layer of government in my already constricted life.

This seems to be the SOA is trying to make it easier for the SOA to pass off the 66 and over retiree's onto the federal government.

I worked hard for the SOA and earned this retirement benefit, I will not be on board with this proposal.

I hope that other retiree's feel the same and that we could all join a class action together.

Denise Branshaw
Dear Vanessa,

Thank you for allowing me to enter this email, not just a concern but a complaint, regarding the healthcare for retirees. Please confirm receipt and that this will go in the packet ahead of the November 2018 meeting.

The following is a short summary of problems I have encountered and a suggestion where I have one for corrections:

#1. AETNA is denied the option to email us with anything. They tell me it is the contract that Alaska has signed, prohibiting emails to us, as insured. This is a problem, forcing us to make exact notes as we talk to AETNA about questions, concerns, requests, etc.
SOLUTION: THIS IS A PROBLEM and AETNA or whomever you hire should be paid to compensate for emailing us to confirm info.
I have found that what AETNA says is not accurate, or complete, very often.

#2. AETNA often takes a long time to get me to the person I need to talk to. Hold times, wrong person who doesn't know, etc. is a problem.
SOLUTION - either more people hired by AETNA to handle insured requests / questions or a specific person by email so that we are not always thrown from one to the other with no consistency.

#3. FORM AETNA uses to report requests for payment is not clear. I often go to a small clinic with short-term providers who are there on a contract, or temporary basis in Arizona. It is the only medical provider where I have a winter home, and for 100+ miles away.
SOLUTION: Put the CLINIC / HOSPITAL / name on the front of the page. The actual professional's individual name can be where it currently is, but this would eliminate me (possibly lots of us) wondering who is Dr. XXX for example.

#4. AETNA failed to [Redacted] in 2018. Both have threatened to report me to bad credit.
SOLUTION: AETNA responds to the insured and the vendor within 5 working days, whether with follow-up questions or with payment so everyone knows a payment or explanation is to follow.

THank you.

Linda Sharp, Retiree
Alaska
Thank you, Vanessa.
You may also forward this addition remark from me:

I first began working in the area of health insurance directly after graduating from UAA. An outstanding HC administrator with Westin Hotels was my mentor. He served all Westin Hotels’ group insurance coverage in the 1970’s. He taught me not only what good coverage looks like, but what a statement that was easy for lay person to understand. He also taught me that insurance companies (yes even 40 years ago -- would often under pay, delay in paying, and in other ways not properly serve the insured. The insurance companies RARELY ever over paid.

From that time forward I have served in varying capacities to assist my own family members as well as in many years, as a HC admin for various corporations.

If I am having these challenges, I feel certain there are a good percentage of others having challenges that they don't have the energy to report to you.

It is your obligation to get us better than what AETNA provides.

Linda Sharp, DRB retiree / insured

On Fri, 31 Aug 2018 16:59:26 +0000, "Alaska Retiree Health Plan Advisory Board (DOA sponsored)"

wrote:

Good Morning Linda,

I know you received an auto-reply, but I wanted to personally let you know that I've got it and it will most definitely go in the next packet of public comment that the RHPAB members review. However, I think your e-mail is also directly related to how the State of Alaska and AETNA interreact, therefore I am forwarding this to my colleagues in Juneau, in the Division of Retirement and Benefits, for further follow up.

Thank you again for taking the time to air your complaint.

Vanessa Kitchen
Administrative Assistant
Department of Administration
Commissioner's Office
907-269-6293
Dear Vanessa,
Thank you for allowing me to enter this email, not just a concern but a complaint, regarding the health care for retirees. Please confirm receipt and that this will go in the packet ahead of the November 2018 meeting.

The following is a short summary of problems I have encountered and a suggestion where I have one for corrections:

#1. AETNA is denied the option to email us with anything. They tell me it is the contract that Alaska has signed, prohibiting emails to us, as insured. This is a problem, forcing us to make exact notes as we talk to AETNA about questions, concerns, requests, etc.
SOLUTION: THIS IS A PROBLEM and AETNA or whomever you hire should be paid to compensate for emailing us to confirm info.
I have found that what AETNA says is not accurate, or complete, very often.

#2. AETNA often takes a long time to get me to the person I need to talk to. Hold times, wrong person who doesn’t know, etc. is a problem.
SOLUTION - either more people hired by AETNA to handle insured requests / questions or a specific person by email so that we are not always thrown from one to the other with no consistency.

#3. FORM AETNA uses to report requests for payment is not clear. I often go to a small clinic with short-term providers who are there on a contract, or temporary basis in Arizona. It is the only medical provider where I have a winter home, and for 100+ miles away.
SOLUTION: Put the CLINIC / HOSPITAL / name on the front of the page. The actual professional’s individual name can be where it currently is, but this would eliminate me (possibly lots of us) wondering who is Dr. XXX for example.

#4. AETNA failed to in 2018. Both have threatened to report me to bad credit.
SOLUTION: AETNA responds to the insured and the vendor within 5 working days, whether with follow-up questions or with payment so everyone knows a payment or explanation is to follow.

Thank you.

Linda Sharp, Retiree
Alaska
I am an Alaska State Retiree. I know that several states offer their retirees a benefit such as “Silver Sneakers”. This allows the retiree to join a gym or YMCA for free or reduced rate. I am not aware if Alaska has this benefit. When I contacted Retirement and Benefits, I was referred to this Board.

I think that this would be a great benefit for retirees and in the long run probably more cost effective for the State of Alaska. I do not reside in Alaska but feel this kind of program would benefit all retirees.

Mary Hughes Thompson

Sent from Windows Mail
Hello Judith,

I apologize that it has been awhile since we last talked. Rep. Josephson and I have been spending a lot of time listening to Retiree Health Plan Advisory Board (RHPAB) meetings, speaking with representatives of RPEA, and meeting with members of the administration (DRB and DOA). Now that we’ve further educated ourselves and had some productive conversations, I would like to better address the concerns you voiced to us over a month ago.

1. **EGWP:**

   The RHPAB unanimously passed a [resolution](#) in support of adopting the EGWP wrap, and the administration plans to move forward in adopting it. We have spent a considerable amount of time researching this, as has the administration and the advisory board, and I have real confidence that *EGWP adoption should not affect your pharmaceutical benefits.* There will be a slight administrative hurdle for high-earning retirees, but aside from that, the formulary, (drugs covered under the plan), and the coverage for prescriptions will not change. I completely understand your hesitance towards such a great change, especially when administrations have reduced benefits for retirees in the past, but when it comes to EGWP, this seems like a good thing for both retirees and the state. Additionally, if for some reason the EGWP does not work according to plan or there are issues, we will be able to opt out and return to the status quo. I can assure you that we plan on continuing to follow the issue and look forward to the program’s success.

2. **Public Process:**

   Your concerns about the complicated nature of these issues and public process are completely valid. The EGWP issue alone takes a great deal of time to understand if you’re not familiar with health care policies; I’m not myself and it took time for me to understand. As far as public notice and public process go, the administration has been doing almost everything in its power to make sure retirees are included in this process. They have sent out postcards, newsletters, posted on social media, posted fliers, have held tele-town halls, and have received over 200 pages of comment which are posted online. Also, the RHPAB meetings teleconferenced and online are a great resource if you would like to dig deeper into the topic. There have been over two months of meetings along just on EGWP adoption. I am deeply concerned if you did not receive any of these notices and only heard of the change through RPEA. I will talk to DRB to make sure you are included in their outreach. I suggest signing up for DOA’s email updates [here](#) so that you won’t be left in the dark.

   However, in spite of the fact that the administration has been trying to educate retirees, some of them, yourself included, still feel like they are being left behind and left out of the conversation. These issues are complicated, and it can feel like by the time you understand them it is too late to speak out. **We do not want that to be the case for any retiree.** I encourage you, *if you have any questions or concerns about the modernization process, opportunities to participate, and/or opportunities for public comment, please do not hesitate to ask and we will get back to you.* Also, with your permission, I would like to share your original email with DOA, so that they might be made aware that there is room for improvement in their public outreach. If you have any suggestions as to how the administration might improve educating retirees about these proposals please let us know, and we will pass them along.
3. Health Care Plan Modernization:

Firstly, it’s important to note that EGWP implementation and the modernization process are two separate things. I don’t believe there are any proposals at this time to make changes to pharmaceutical benefits in the plan modernization. Another thing that is very important to note, is that plan modernization is still being developed. Just like how there was with EGWP, there will be many work group meetings, tele-town halls, and RPHAB meetings where modernization is discussed and the details fleshed out, and more importantly, where retiree concerns will be taken into consideration. Analysis hasn’t been completed yet. So regarding modernization, there is not a lack of transparency because there hasn’t been much to share. This process of public participation, development, and analysis will be taking place starting now over the course of this next year; DOA doesn’t anticipate it being implemented until around next May, (this is an approximation subject to change). Additionally, DOA Commissioner Ridle has assured us that they will be completing a benefit analysis of proposed changes and making this information available. On another note, I have spoken with members of the RPHAB Board, and they have communicated to me that the process thus far has been collaborative, and that they plan on continuing to work with the administration to ensure that retiree questions and concerns are addressed and considered as modernization policies are fleshed out. I highly encourage you to listen in to the RPHAB meetings and participate in the tele-town halls over this upcoming year, as there will be plenty of time to hear the proposals and make your voice heard.

Rep. Josephson and I will continue to diligently monitor the process of plan modernization as it develops, to make sure that we don’t see another diminishment of benefits like those described in the Duncan lawsuit, and that retirees are kept in the loop and given a voice. If either health plan benefits or retiree participation are jeopardized during this plan modernization process then Rep. Josephson will be opposing it, but for now, it is simply too soon to say.

I hope that this clears up some of your frustrations, provides you with the comfort of knowing that we will continue to work diligently on this, and encourages you to participate in the modernization process this year. There are many exciting things DOA will be discussing, including covering preventative care, removing the lifetime maximum, adding travel benefits, and covering alternative therapies like rofling and acupuncture. What we need to be vigilant of are plan changes proposed in order to offset the costs of new/improved benefits. There are many details to iron out and conversations to be had, but it is not too late for you to be a part of the process, and I would be happy to help facilitate that.

Sincerely,

Megan Holland
Office of Representative Andy Josephson
1500 West Benson Avenue, Suite 403
Anchorage, AK 99503
907-269-0265
megan.holland@akleg.gov
Thanks for forwarding the report from Legislative Research. We certainly understand the whole EGWP better because of that report. We think most of our questions related strictly to the EGWP have been answered. However, at the present time DRB/DOA is also conducting an effort to modernize the healthcare plan. It looks like it contains yet more changes to pharmaceutical benefits on top of the proposed implementation of the EGWP. Since we are just beginning to understand the EGWP, we are concerned about DRB/DOA proposing changes to a plan not yet in place.

The EGWP and the Public Process
We noticed in the report there was a comment that DRB felt that there was a lot of misunderstanding of the EGWP. The EGWP is a very complicated issue especially for us as retirees. We think that if DRB/DOA was more proactive, more transparent and improved their communication with retirees it would go a long way towards taking care of misunderstandings. It does not appear to us that DRB/DOA actively informs retirees of actions of any kind that they take regarding our healthcare or other issues either for that matter. It is our understanding that DRB/DOA puts info on the website and assumes that retirees will see it. The only reason we became aware of not only the EGWP but also the modernization of the whole retiree health care plan is because RPEA has informed us. Most of our understanding of retiree issues has come from RPEA not from DRB/DOA.

The EGWP and the Modernization of Retiree Health Care Plan
We do have a concern that is not addressed by this report from Legislative Research regarding the EGWP. As we stated above, DRB/DOA is not only proposing to set up the EGWP but also in a separate effort to modernize the entire retiree health care plan including yet more changes to the pharmaceutical section of our plan. It appears the additional changes to pharmaceutical are on top of the EGWP which is not yet in place. This is extremely difficult to understand.
We recognize that Legislative Research was tasked with reviewing only the EGWP proposal. But this additional effort by DRB/DOA to modernize the entire health care plan including the new pharmaceutical section which isn’t even in place is extremely confusing. It would have been helpful if Legislative Research had had an opportunity to look at the modernization effort of the entire health care plan as well.

**Regarding the Modernization**

We are concerned about the approach being taken by DOA/DRB in revising/modernizing our health care plan including but not limited to:

1. the lack of transparency both by the department and in the documents produced by DOA/DRB
2. the lack of sharing information related to - cost savings versus added expenses of additions and deletions to our plans
3. confusion of putting through major changes to the pharmaceutical plan - the EGWP and then on top of those, as yet to be adopted changes proposing additional changes to the pharmaceutical portion in the modernization plan as a whole
4. The lack of contact, outreach, and education to retirees about what all these changes mean

**SUMMARY**

While we understand the EGWP better because of Legislative Research report we continue to be concerned about the fact that the EGWP is not in place, but the proposed modernization of the entire retiree health care plan contains even more changes to the pharmaceutical portion of our plan.

As retirees, we are very disappointed to be treated this shabbily by our home state of more than 50 years. Retiree health care is constitutionally covered. We should be kept in the loop as to any and all changes.

We would like to thank Representative Josephson for his attempt to help us understand what is happening and RPEA for their efforts to keep us informed as to changes in our benefits.

Judith Anderegg and David Pelto

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On Aug 6, 2018, at 2:52 PM, Megan Holland <Megan.Holland@akleg.gov> wrote:

Hello Judith and David,

Attached is the report we recently received from Legislative Research regarding the effects of implementing EGWP in the state of Alaska. Tom will be on vacation for the next few months, and he has instructed me to take over his work on this issue. Feel free to reach out with any additional comments or concerns. I will be in touch moving forward.

Thank you,
Legislative Update
Retiree Health Plan
September 7, 2018

Dear Legislators,

We would like to inform you of our current effort to update and modernize the AlaskaCare retiree health plan. For the past eight months, the Department of Administration’s Division of Retirement and Benefits (DRB) has been working collaboratively with the Retiree Health Plan Advisory Board (RHPAB), a new board tasked with providing the Commissioner of Administration with feedback, input, and policy recommendations for the AlaskaCare defined benefit retiree health plan.

Our goal in this effort is threefold: protect, improve and sustain the plan.

- Protect: Preserve the overall benefit of the constitutionally protected plan
- Improve: Address areas where retirees would like to see changes or improvements (for example, covering preventive care or removing the $2 million lifetime maximum)
- Sustain: Implement cost savings mechanisms to increase purchasing power and overall value to the plan

DRB has been working with RHPAB through multiple public meetings since May to outline a process for evaluating any future changes to the retiree health plan, as well as gathering a list of potential changes to evaluate. The list is still under development and analysis has started.

Meeting materials and audio recordings of all the meetings are available for review at: http://doa.alaska.gov/drb/alaskacare/retiree/advisory.html.

In addition to the ongoing modernization work, DRB has been working with RHPAB to evaluate adoption of a Medicare Part D Employer Group Waiver Plan (EGWP). This is a back-office, administrative change to how the retiree health plan receives federal subsidies for pharmacy claims – it does not change the pharmacy benefits retirees receive today. Currently, DRB uses a program called the Retiree Drug Subsidy (RDS), which provides around $20 million in annual federal subsidies to the health plan. Moving to an EGWP will result in larger savings for both the health plan and the state, while maintaining the current level of benefits to members. Transitioning to an EGWP will:

- Keep the pharmacy co-pays ($4 for generics and $8 for other) the same for retirees;
- Double the amount of federal subsidies the plan receives (estimated increase by $16-23 million annually);
- Reduce the pension system unfunded liability by an estimated $520-694 million; and
- Reduce the state assistance payment (all general fund) by $40 to $52 million annually.

These savings can be achieved without a change in the benefit retirees receive today. There will be some administrative requirements for certain individuals, but all copays will remain the same, as will the drugs covered by the health plan. Appeals will not change, and step therapy will not be required. A detailed analysis of the changes can be found on page 74 of the following link:

Additional information including Frequently Asked Questions is available at: [http://doa.alaska.gov/drb/alaskacare/retiree/faqs/egwpFaqs.html](http://doa.alaska.gov/drb/alaskacare/retiree/faqs/egwpFaqs.html)

In developing this analysis, DRB engaged in several public meetings with RHPAB board and a smaller working group on the following dates:

- May 8  Overview of EGWP to full RHPAB
- June 12  Developed analysis framework with RHPAB Modernization Committee
- July 26  Reviewed draft proposal with RHPAB Modernization Committee
- August 10  Reviewed updated draft proposal with RHPAB Modernization Committee
- August 29  Reviewed proposal of EGWP with full RHPAB; began Review of the modernization process

Additionally, DRB sent several postcards and fliers to members, initiated an e-newsletter focusing on EGWP, and conducted a tele-townhall meeting to answer member questions about EGWP. All these materials, including the audio recordings of the hearings and the tele-townhall, are available online.

In the full board meeting on August 29, RHPAB voted unanimously in support of a resolution adopting DRB’s EGWP proposal. Last year, the Alaska Retirement Management Board passed a resolution in support of EGWP.

DRB is contacted daily by retirees who desire certain benefits now common in most health plans, including preventive care and removal of the lifetime maximum, which causes significant hardship to those individuals who find themselves without insurance. DRB also believes that given the state’s fiscal crisis, we can no longer wait to engage in cost-savings measures.

Given the critical importance of these benefits, and the underlying constitutional protections, making any change to the health plan is challenging, but that doesn’t mean it can’t be done in collaboration with retirees. The retiree plan was changed in the past to accommodate advances in science and health care, and we believe it is in the best interest of the membership and the state to undertake that process again. We will only be successful if retirees are meaningfully engaged in the process, and we’re excited to be working with RHPAB and increasing our direct communications with our membership.

There will likely be litigation – there always is – but we will continue to work through a public process in evaluating and discussing potential changes to ensure that retiree have access to the health care they require and the benefits they were promised.

Should you have any questions, please don’t hesitate to reach out to me or our staff in the Division of Retirement and Benefits.

Sincerely,

Leslie Ridle
Commissioner

CC Darwin Peterson, Governor’s Legislative Director
Attn:  Ms. Judy Salo

I was one of two members of the public who spoke at the July meeting here in Juneau.

I asked that the group add to their long term agenda discussion regarding the provision of expanded coverage for transgender retirees.

Could you tell me if there was any further discussion or action by the Committee or by State administrators regarding my request?

One does want to exhaust ones administrative options.

Thank you for your efforts in behalf of all retirees and hopefully my very small subset.
Attn: Advisory Board Members

As a recent retiree from the Anchorage School District, it came as a great surprise that my retirement health benefits as a Tier 1 employee are in jeopardy of being deduced or diminished. I began my teaching career in Texas in 1979 and moved to Alaska to begin teaching with the Anchorage School District in 1989. I left family and friends behind for the chance of earning a livable wage and the promise of the Tier I benefits. Now, as a newly retired 63-year old with multiple health issues, there is cause for great alarm to me. I am trying to live on a much-reduced income but was hopeful that it would be somewhat balanced out for me with my much-anticipated retirement health plan. I worked for many years for this, I moved across the country for this, and I feel that the teachers who have dedicated their lives to students should not have this taken away or diminished. They were promised – that is why brought many of us to this state in a time it was difficult to recruit. I have no regrets – I love Alaska, but this is simply a slap in the face to those of us who came this far and worked this hard.

When one considers the facts that this health care program was only offered to Tier I and II employees, that when those employees are all deceased the funding will no longer be needed, and that according to the latest retirement posting the fund has an excess of 9 BILLION dollars available, it is astonishing to think that the committee would reduce the benefits (in this case by raising the out-of-pocket and deductibles).

Please reconsider and do the right thing. Do not diminish the health care benefits for the retirees.

Mary K Wilts
I am writing to express my full support for adding acupuncture coverage to state of Alaska retiree coverage. Acupuncture saves money with drug free, effective treatment and saves lives by decreasing or eliminating the need for dangerous medications like anti-inflammatories.

Thank you for your consideration!

Amy Williamson
Frank Therrell - retiree and currently covered.

Dr. Amy Williamson RN, ND
Fairbanks Family Wellness

This email may contain confidential material. If you believe you have received it in error, please delete the contents and notify the sender of the error.

Email consultation is not a substitute for emergency assistance. Please call 911 or go to the ER if your symptoms are severe.
Dear Retiree Health Plan Advisory Board:

I and other acupuncturists have repeatedly tried to get acupuncture covered. The State once let it die a couple of years ago the last time I pursued it. I was never advised there was a Board, though I met with Senator Ellis's Aid, someone from the State AG's office, someone from Retirement and Benefits, and I forget who the 4th person was.

Please see the attached report that Legislative Affairs prepared the 2nd time we tried to get it into State Law, and other information of cost-savings benefit in subsequent emails.

Thank you,
Valerie DeLaune

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Valerie DeLaune, LAc  (Licensed Acupuncturist)

Clinic: Alaskan Natural Care Clinic

Author of:

“Pain Relief with Trigger Point Self-Help” (CD ROM format, 2004)
“Pain Relief with Trigger Point Self-Help” (book format, 2011)

“Trigger Point Therapy for Shoulder Pain” (e-book and print, 2012)
“Trigger Point Therapy for Upper Back and Neck Pain” (e-book and print, 2012)

“Trigger Point Therapy for Lower Back and Gluteal Pain” (e-book and print, 2012)

“Trigger Point Therapy for Knee, Leg, Ankle & Foot Pain” (2010)

“Trigger Point Therapy for Shoulder Pain” (print, 2012)
“Trigger Point Therapy for Headaches and Migraines” (print, 2015)

“Trigger Point Therapy for Shoulder Pain” (print, 2012)

Cost effectiveness of acupuncture AK L

Plus 10 more pdf. attachments
Addendum A

(See separate Addendum A, was unable to insert into Public Comment packet)

Cost Effectiveness of Acupuncture AK Leg

1998.pdf

Bonnie K. Lind, Ph.D.,1,2 William E. Lafferty, M.D.,3 Patrick T. Tyree, A.A.,1 and Paula K. Diehr, Ph.D.1,4

Abstract

Objectives: The purpose of this analysis was to compare health care expenditures between insured patients with back pain, fibromyalgia syndrome, or menopause symptoms who used complementary and alternative medical (CAM) providers for some of their care to a matched group of patients who did not use any CAM care. Insurance coverage was equivalent for both conventional and CAM providers.

Design: Insurance claims data for 2000–2003 from Washington State, which mandates coverage of CAM providers, were analyzed. CAM-using patients were matched to CAM-nonusing patients based on age group, gender, index medical condition, overall disease burden, and prior-year expenditures.

Results: Both unadjusted tests and linear regression models indicated that CAM users had lower average expenditures than nonusers. (Unadjusted: $3,797 versus $4,153, \( p = 0.0001 \); \( \beta \) from linear regression -$367 for CAM users.) CAM users had higher outpatient expenditures that which were offset by lower inpatient and imaging expenditures. The largest difference was seen in the patients with the heaviest disease burdens among whom CAM users averaged $1,420 less than nonusers, \( p < 0.0001 \), which more than offset slightly higher average expenditures of $158 among CAM users with lower disease burdens.

Conclusions: This analysis indicates that among insured patients with back pain, fibromyalgia, and menopause symptoms, after minimizing selection bias by matching patients who use CAM providers to those who do not, those who use CAM will have lower insurance expenditures than those who do not use CAM.

Introduction

The use of complementary and alternative medicine (CAM) has grown in recent decades, and as a result insurance coverage for various types of CAM providers has become more prevalent. But due to concern over ever-increasing health care costs, increasing emphasis is being given to cost-effectiveness of care. Patients desire choices in sources of health care, but if CAM providers are to be added to insurance coverage, their care must be cost effective.

One researcher noted that CAM therapies may be good candidates not only for cost-effective care but even cost savings, because “they avoid high technology, offer inexpensive remedies, and harness the power of vis medicatrix naturae (the body’s natural ability to heal itself)”\(^6\). However, several difficulties have hindered the assessment of CAM’s cost effectiveness. One of the biggest challenges in evaluating the effect of CAM use on health care costs is the selection bias inherent in patients’ self-selection into CAM using and non-CAM using groups.\(^7\) Researchers have consistently reported that CAM users have poorer health status, more visits to conventional providers, and/or higher rates of hospitalization than nonusers.\(^8\)–\(^14\) Thus, it has been difficult to find or create comparable groups of CAM users and nonusers for which costs can be compared.

In the early 1990s, a Swiss group conducted a randomized clinical trial offering free insurance coverage of CAM providers to half of a group of insured individuals. They

\(^1\)Department of Health Services, University of Washington, Seattle, WA.
\(^2\)Research Department, St. Luke’s Health System, Boise, ID.
\(^3\)Department of Informatics, University of Missouri School of Medicine, Kansas City, MO.
\(^4\)Department of Biostatistics, University of Washington, Seattle, WA.
reported that covering CAM care did not lead to an increase in costs for the insurance company because CAM utilization comprised only a tiny percentage of overall expenditures.\(^{15}\) Given the increase in CAM use since the early 1990s in the United States,\(^{12}\) the cost of CAM coverage today might be larger than that found in the Swiss study. However, data from Washington State, which mandates private insurance coverage of all licensed CAM providers,\(^{16}\) found a similar tiny percentage of expenditures devoted to CAM care based on data from 2002.\(^{17}\) The Washington State data reflect self-selection of patients into CAM-using and nonusing groups and thus may reflect a more “real-world” experience for insurance companies than the Swiss randomized study.

Another difficulty in performing economic analyses of CAM use occurs because many CAM providers are not covered by insurance, and patients pay for their services out of pocket. As a result, data on CAM utilization and expenditures are not available in administrative databases and must be collected through primary data collection,\(^{6}\) which may be subject to recall bias and response bias. Washington State provides a unique environment in which to perform an economic analysis of CAM use because of the state-mandated insurance coverage referenced above. As a result, administrative claims data from Washington State include data on CAM utilization and expenditure that are consistent with data for conventional care.

A final difficulty in performing a cost–benefit evaluation of CAM involves measuring outcomes of care. Data on outcomes of care are not available in the administrative claims databases often used to provide data on expenditures. With CAM care, a further difficulty lies in how to quantify what Hollingshurst refers to as “the wider benefits of CAM,” some of which may appear over long periods of time or be based more on a patient’s sense of well-being than a measurable clinical outcome.\(^{7,18}\) To avoid these problems in measuring outcomes, this analysis takes a cost-minimization approach,\(^{6}\) analyzing which of two approaches to care is associated with lower overall expenditures, assuming comparable health outcomes between the two approaches.

The purpose of this article is to compare insurance expenditures for matched groups of CAM users and nonusers with selected health conditions, to evaluate whether use of CAM for some care is associated with higher or lower overall health care expenditures.

**Materials and Methods**

**Population**

This research was approved by the institutional review boards of the University of Washington and Boise State University. The study sample was constructed using 2000–2003 enrollment and claims data from two large insurance companies in Washington State that offer a variety of product types. The analysis was restricted to insured individuals covered by the law requiring coverage of CAM providers, which excluded enrollees funded through Medicare, Medicaid, or other state or federal programs. The data acquisition process, data cleaning, and the creation of analytic variables have been previously described.\(^{19}\) The analyses presented here were limited to adults aged 18–64 who had at least 2 continuous years of coverage and at least one visit that contained a diagnosis for one of the index conditions defined below.

**Index conditions.** Three health conditions were chosen for study: back pain, fibromyalgia syndrome (FMS), and menopause symptoms. These index conditions were selected because a substantial proportion of associated patients use CAM for at least part of their care.\(^{17,20,21}\) FMS was defined as at least one visit containing ICD-9 code 729.1. Low back pain and menopause symptoms were defined using the Johns Hopkins Adjusted Clinical Group (ACG) software, Version 8,\(^{22}\) which groups ICD-9 codes per visit into expanded diagnosis clusters (EDC). Low back pain was defined as EDC MUS14 (Low Back Pain) and menopause symptoms was defined as EDC FRE11 (Menopausal Symptoms).

**Time frame.** Two (2) time periods of interest were created. The “study year” for each patient started on the day of the first visit for an index condition and continued for 365 days; and the “prior year” for each patient was defined as the 365 days preceding the first visit for the index condition. All data were derived from calendar years 2000–2003.

Patients included in the analysis had at least one provider visit containing an ICD-9 code/EDC for an index condition during the study year and no visits containing an ICD-9 code/EDC for the index condition during the prior year.

**Provider types.** CAM providers were defined as chiropractors, licensed massage therapists, acupuncturists, and naturopathic physicians. Conventional providers were defined as physicians (including osteopaths and specialists), advanced registered nurse practitioners, and physician assistants.

**Dependent variables.** Dependent variables were total allowed expenditures in the study year, outpatient expenditures, expenditures related to the index condition, and expenditures related to imaging procedures (back pain patients only). Data for each visit included the dollar amount the insurance company allowed for that visit. These amounts were totaled over the study year to create total allowed expenditures. For some analyses, these totals are broken out into allowed expenditures for CAM visits versus allowed expenditures for conventional visits. Imaging expenditures were divided into expenditures for plain radiographs and expenditures for all other types of imaging (e.g., magnetic resonance imaging [MRI], computed tomography). Imaging expenditures were further divided into those that occurred within 28 days of the initial diagnosis (called “early” imaging) and those that occurred more than 28 days after initial diagnosis. This division was based on the Healthcare Effectiveness Data and Information Set recommendation that no imaging should be performed within the first 28 days after an initial diagnosis of back pain.\(^{23}\)

**Independent variables.** Age, gender, and zip code were included in the claims information along with ICD-9 diagnosis codes, dates and types of visits, and providers seen. County population was calculated based on 2000 census data and then categorized as <100,000; 100,000–400,000; and >400,000.
CAM users were defined as patients with at least one visit to a CAM provider for the index condition during the study year. Most also had at least one visit to a conventional provider for the index condition. CAM nonusers were those with no visits to a CAM provider for any reason during the study year and at least one visit to a conventional provider for the index condition during the study year.

Overall disease burden for each patient was constructed using the Resource Utilization Band (RUB) index created by the Johns Hopkins ACG software described above. RUBs estimate the overall disease burden and expected resource use for each individual, and are created by grouping individuals with similar levels of expected resource use based on the ACG index. Lower RUBs included individuals with less expected resource use and higher RUBs included those with greater expected resource use. Throughout the Results and Tables, the term “Low disease burden” refers to patients in RUBs 1 and 2; “Moderate disease burden” refers to patients in RUB 3; and “High disease burden” refers to patients in RUBs 4 and 5. For the regression analysis, disease burden was dichotomized into high versus moderate or low.

Matching. Because patients were not randomly assigned to use CAM but rather self-selected into CAM users and nonusers, we used a matching process to create groups that were as comparable as possible, using a frequency matching process. That is, each CAM user was placed into a stratum based on index condition, gender, 10-year age group, total allowed expenditures during the prior year (matched within $1,000 up to $9,999; all expenditures $10,000 or above were grouped), and disease burden categorized as high, medium, or low during the study year. The number of CAM users in each stratum was determined and half that number of CAM nonusers in each stratum was randomly identified, resulting in a 2:1 match. The 2:1 matching process was necessary because there were too few CAM nonusers in many strata to create a 1:1 match. There were 1330 potential strata, of which 770 contained at least one CAM user. In 256 strata there were an odd number of CAM users, creating the need for a de facto 3:1 match for these individuals. In addition, there were 125 CAM users who could not be matched due to too few controls in the stratum. All CAM users were included in the analysis, including the total of 381 (1.4%) described above who could not be placed in a 2:1 match. Characteristics of unmatched CAM users are described in the Results section.

Statistical analysis. Independent samples t tests were used for unadjusted comparisons of expenditures (total, outpatient, and expenditures related to index condition) between CAM users and nonusers, also to compare mean age. Chi-square tests were used to compare distributions of gender, disease burden, county population, and insurance companies between CAM users and nonusers.

Linear regression analysis was used to perform adjusted comparisons of total expenditures between CAM users and nonusers after adjustment for age, gender, disease burden, county population, and insurance company. Disease burden was dichotomized as high disease burden versus low or moderate disease burden, and an interaction term between CAM use status and disease burden was included in the model. Beta estimates for the interaction terms were calculated using the lincom function in Stata (Stata Corp., College Station, TX).24 Models were constructed for all patients combined and then separately for those with each index condition.

Although expenditure data are highly skewed, leading to a violation of the requirement for constant variance and for normally distributed residuals from the model, the large sample size available here ensures that estimates will be accurate, based on the Central Limit Theorem (CLT).25 However, it was not apparent whether the groups with FMS (n = 5508) or menopause (n = 6566) were large enough for the CLT to apply for the two models created from these smaller samples. Two (2) simulation analyses were performed to determine this, one analysis for the FMS group and the other for the menopause group. In each case, 1000 bootstrap samples were created from the original sample and regression analyses were performed. If the CLT is applicable, 95% of the β estimates from these 1000 models should fall in the 95% confidence interval based on the entire group. Results of the analysis showed that for the FMS group, 97.2% of the β estimates fell into the 95% confidence interval, and for the menopause group, 96.8% of the β estimates fell into the 95% confidence interval. Based on these results, we were confident that the linear regression models would give us accurate estimates in spite of the skewed nature of the dependent variable. To ensure accurate inference, “robust” standard errors were used.26 Stata version 10 was used for all analyses.27

Results

A total of 26,466 CAM users were identified for this analysis: 18,343 with back pain, 3722 with FMS, and 4401 with menopause. These were matched to 13,025 CAM nonusers on a 2:1 basis. There were 381 (1.4%) CAM users who were not matched in this process; 125 due to having no matching controls available and the remaining 256 due to having an odd number of CAM users in some strata. All CAM users were included in the analysis. Those who were unmatched were younger (mean 42.4 versus 45.2 years, p < 0.0001); had higher average total expenditures in the study year ($5,902 versus $3,766, p < 0.0001); and had heavier disease burdens in the study year (46% in highest category versus 33% among matched CAM users, p < 0.0001). To the extent the inclusion of these unmatched CAM users may lead to bias, it will make CAM users look more expensive than the matched controls. However, because the unmatched CAM users are only 1.4% of all CAM users, any bias will be small. For example, as stated above, the mean total expenditure was $3766 for matched CAM users. When the 381 unmatched CAM users were included, mean expenditure for all CAM users was $3,797.

Table 1 displays the comparison of the CAM users and nonusers. The groups did not differ on average age, average allowed expenditures in the prior year, percent female, or disease burden in the study year; that is, as expected, users and nonusers did not differ on any of the matching criteria. CAM users and nonusers were not matched on county population or insurance company, and CAM users were less likely to live in urban counties than nonusers, also more likely to be from insurance company B.

Table 2 displays the results of unadjusted t-tests which showed that CAM users had lower overall average...
expenditures than nonusers in the study year ($3,797 versus $4,153, \ p = 0.0001). The distribution of expenditures for outpatient, inpatient, and other expenditures differed between the two groups; CAM users had higher average outpatient expenditures ($1,848 versus $1,502, \ p < 0.0001) but lower inpatient expenses and lower expenses for other types of claims not linked to a specific provider visit such as imaging and lab claims (Fig. 1). Among CAM users, expenditures for conventional outpatient care were lower than among CAM nonusers ($1,219 versus $1,502, \ p < 0.0001), but this was offset by CAM expenditures, which averaged $630 per user.

When analyses were restricted to visits related to the index condition, total average expenditures were slightly higher among CAM users ($588 versus $554, \ p = 0.04), while average outpatient expenditures related to the index condition were much higher among CAM users ($445 versus $231, \ p < 0.0001) (Table 2). The expenditure patterns were similar within each condition (Table 3).

The linear regression analysis revealed a significant interaction between CAM use and disease burden. Among those in the low or moderate disease burden category, CAM users were predicted to have mean total expenditures $160 lower than nonusers. However, among those with high disease burden, predicted mean expenditures for CAM users were $1,421 lower than for nonusers ($6,726 for nonusers compared to $5,305 for CAM users, \ p < 0.001) (Table 4). When a model was fit excluding the interaction term, the $\beta$ coefficient for CAM use was $-367$ (standard error = 90, \ p < 0.001), confirming that overall, after adjustment, CAM users as a group have lower average total expenditures than nonusers. Similar results were seen in regression models restricted to each index condition.

The next set of analysis was aimed at identifying where the differences in expenditures between CAM users and nonusers occurred. Expenditures were analyzed by gender, and results showed that among males, CAM users had significantly lower expenditures than nonusers ($2,863 versus $3,634, \ p < 0.0001), while among females average expenditures did not differ significantly between CAM users and nonusers ($4,266 versus $4,412, \ p = 0.19). CAM users were less likely to be hospitalized (5.2\% versus 7.5\%, \ p < 0.001), and among those with menopause symptoms, CAM users were less likely to get a hysterectomy within 1 year of diagnosis (1.3\% versus 2.9\%, \ p < 0.001). Next we looked at the contribution of imaging to expenditures among back pain patients. CAM users were more likely than nonusers to have some type of imaging done (42.6\% versus 38.3\%, \ p < 0.001) and were also more likely to

### Table 1. Comparison of Complementary and Alternative Medicine (CAM) Users and Nonusers Matched on Age Group, Gender, Allowed Expenditures in Prior Year, and Disease Burden in Study Year

<table>
<thead>
<tr>
<th>CAM users</th>
<th>CAM nonusers</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n = 26,466)</td>
<td>(n = 13,025)</td>
<td></td>
</tr>
<tr>
<td>Average age (SD)</td>
<td>45.2 (10.5)</td>
<td>45.4 (10.6)</td>
</tr>
<tr>
<td>Average allowed expenditures in prior year (SD)</td>
<td>$2,494 (6351)</td>
<td>$2,454 (6114)</td>
</tr>
<tr>
<td>Percent female</td>
<td>66.6%</td>
<td>66.7%</td>
</tr>
<tr>
<td>Disease burden in study year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>8.3%</td>
<td>8.1%</td>
</tr>
<tr>
<td>Moderate</td>
<td>58.3</td>
<td>58.7</td>
</tr>
<tr>
<td>High</td>
<td>33.4</td>
<td>33.2</td>
</tr>
<tr>
<td>County population</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100,000</td>
<td>11.9</td>
<td>8.4</td>
</tr>
<tr>
<td>100,000–400,000</td>
<td>15.2</td>
<td>11.0</td>
</tr>
<tr>
<td>&gt;400,000</td>
<td>72.9</td>
<td>80.6</td>
</tr>
<tr>
<td>Insurance company</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>90.8</td>
<td>92.6</td>
</tr>
<tr>
<td>B</td>
<td>9.2</td>
<td>7.4</td>
</tr>
</tbody>
</table>

*CAM users, those with at least one visit to a CAM provider related to index condition during study year; nonusers, no visit to a CAM provider for any reason during study year. SD, standard deviation.

### Table 2. Comparison of Expenditures Between Complementary and Alternative Medicine (CAM) Users and Nonusers in Study Year

<table>
<thead>
<tr>
<th>CAM users</th>
<th>CAM nonusers</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n = 26,466)</td>
<td>(n = 13,025)</td>
<td></td>
</tr>
<tr>
<td>Average allowed expenditures in study year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$3,797 (7623)</td>
<td>$4,153 (9505)</td>
</tr>
<tr>
<td>Outpatient: Total</td>
<td>$1,848 (2370)</td>
<td>$1,502 (3027)</td>
</tr>
<tr>
<td>Conventional CAM</td>
<td>$1,219 (2214)</td>
<td>$1,502 (3027)</td>
</tr>
<tr>
<td>CAM</td>
<td>$630 (746)</td>
<td>0</td>
</tr>
<tr>
<td>Total related to index condition</td>
<td>$588 (1280)</td>
<td>$554 (1947)</td>
</tr>
<tr>
<td>Outpatient related to index condition</td>
<td>445 (594)</td>
<td>231 (438)</td>
</tr>
</tbody>
</table>

SD, standard deviation.
have imaging done "early" (within 28 days of diagnosis): 12.5% versus 9.8%, \( p < 0.001 \). However, overall expenditures related to imaging were higher among nonusers, averaging (standard deviation) $197 ($485) compared to $140 ($388) among CAM users (\( p < 0.0001 \)). This apparently contradictory finding is explained in that CAM users are more likely than nonusers to have plain radiographs (39% versus 28%, \( p < 0.001 \)), and CAM users are less likely to have the other, more expensive types of imaging such as MRIs (11.4% versus 19.4%, \( p < 0.001 \)).

Because CAM users were more likely to be covered by Company B and less likely to live in urban counties than nonusers, analyses were then performed to ensure that the differences in imaging were not due to differences in coverage between companies or differences in access to imaging between rural and urban residents. There was no significant difference in the percentage of back pain patients from Company A versus Company B who had MRI or other "high tech" imaging (all imaging other than plain x-ray). Rates were 14.0% for Company A and 14.7% for Company B (\( p = 0.35 \)). Looking at the issue of access to high-tech imaging in rural areas, Table 5 shows that use of high-tech imaging was substantially lower for CAM users than nonusers for all three categories of county size. Furthermore, for nonusers, rates of high-tech imaging were very similar in the smallest counties (18%) and most urban counties (19%), indicating that lack of access in more rural areas does not explain the difference between CAM users and nonusers.

**Discussion**

The results of this analysis indicated that among patients with back pain, FMS, or menopause symptoms, those who used CAM providers for at least part of their care had slightly lower overall average expenditures than matched patients who saw conventional providers exclusively. The largest difference was seen among the patients with the heaviest disease burden, who tend to be the most expensive patients. Among patients with the lightest disease burden, CAM users tended to be slightly more expensive than nonusers. The majority of patients fall into the low and moderate disease categories, so this is not an inconsequential finding. However, the size of the cost saving among those with heavy disease burdens more than compensated for this; both the unadjusted results and the regression model omitting the interaction term showed that overall, CAM users had lower mean expenditures than nonusers. In fact, given the expected $356 lower expenditure for each CAM user, we

### Table 3. Expenditures by Disease Condition and CAM Use Status

<table>
<thead>
<tr>
<th></th>
<th>Back pain</th>
<th>FMS</th>
<th>Menopause</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>User</td>
<td>Nonuser</td>
<td>User</td>
</tr>
<tr>
<td>N</td>
<td>18,343</td>
<td>9074</td>
<td>3722</td>
</tr>
<tr>
<td>Mean allowed expenditures in study year</td>
<td>$3,410***</td>
<td>$3,739</td>
<td>$4,830*</td>
</tr>
<tr>
<td>Total outpatient</td>
<td>$1,637***</td>
<td>$1,312</td>
<td>$2,374***</td>
</tr>
<tr>
<td>Total related to index condition</td>
<td>$677</td>
<td>$660</td>
<td>$554***</td>
</tr>
<tr>
<td>Outpatient related to index condition</td>
<td>$511***</td>
<td>$259</td>
<td>$407***</td>
</tr>
</tbody>
</table>

*\( p < 0.05 \); **\( p < 0.01 \); ***\( p < 0.001 \).

FMS, fibromyalgia syndrome.

### Table 4. Results of Linear Regression Model

<table>
<thead>
<tr>
<th></th>
<th>All conditions (n = 39,491)</th>
<th>Back pain (n = 27,417)</th>
<th>FMS (n = 5508)</th>
<th>Menopause (n = 6566)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \beta )</td>
<td>SE</td>
<td>( \beta )</td>
<td>SE</td>
<td>( \beta )</td>
</tr>
<tr>
<td>Interaction of CAM use and disease burden:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low disease burden, CAM nonuser</td>
<td>Reference category</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low disease burden, CAM user</td>
<td>$160***</td>
<td>$37</td>
<td>$93*</td>
<td>$41</td>
</tr>
<tr>
<td>High disease burden, CAM nonuser</td>
<td>$6,276***</td>
<td>$230</td>
<td>$6526***</td>
<td>$267</td>
</tr>
<tr>
<td>High disease burden, CAM user</td>
<td>$5305***</td>
<td>$129</td>
<td>$5,196***</td>
<td>$164</td>
</tr>
<tr>
<td>Other covariates in the model:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>$28***</td>
<td>$4</td>
<td>$31***</td>
<td>$4</td>
</tr>
<tr>
<td>Sex</td>
<td>$478***</td>
<td>$88</td>
<td>$452***</td>
<td>$87</td>
</tr>
<tr>
<td>County pop 100k–400k(^{b})</td>
<td>$166</td>
<td>$150</td>
<td>$267</td>
<td>$168</td>
</tr>
<tr>
<td>County pop &gt;400k(^{b})</td>
<td>$230*</td>
<td>$121</td>
<td>$294*</td>
<td>$127</td>
</tr>
<tr>
<td>Insurance co.</td>
<td>$716***</td>
<td>$167</td>
<td>$771***</td>
<td>$204</td>
</tr>
<tr>
<td>Constant</td>
<td>$-1,223</td>
<td>$280</td>
<td>$-1,362</td>
<td>$312</td>
</tr>
</tbody>
</table>

\(^{a}\)Outcome = total allowed expenditures in study year.

\(^{b}\)Compared to counties with population <100k.

\( p < 0.05 \); **\( p < 0.01 \); ***\( p < 0.001 \).

CAM, complementary and alternative medicine; FMS, fibromyalgia syndrome; SE, standard error.
would expect an overall $9.4 million lower expenditure in a group of 26,466 CAM patients with these medical conditions compared to a similar group of CAM nonusers of equal size. CAM users actually had higher outpatient expenditures and more outpatient visits than nonusers, but this was offset by lower inpatient and other expenditures (such as high-tech imaging) among CAM users.

Both Nelson et al. and Legorreta et al. compared insured back pain patients with chiropractic insurance coverage to those without chiropractic insurance coverage and found that those with chiropractic coverage had lower average back pain episode-related costs as well as lower rates of both MR and radiographic imaging. Our findings extend these analyses in finding that among those with chiropractic insurance coverage, those who actually use this benefit have lower costs than those who do not. Our findings also confirm the findings of Sarnat that use of CAM-oriented primary care providers was associated with lower costs than conventional primary care providers.

This analysis has several limitations. First, although CAM users and nonusers were matched as closely as possible, the results may reflect differences between the groups that were unaccounted for in the matching process. Demographic information available in claims data is quite limited and does not include potentially important factors such as income, education, or race. Earlier regression analyses with these data used zip code–level income, education, and race to attempt to adjust for these factors, but none were significant. This likely indicates that the zip code–level aggregation was not sensitive enough to model the effects of these variables in this instance (unpublished data). Due to the correlation between health status and income, matching by disease burden provided limited matching on income.

A second limitation is that claims data are collected primarily for billing reasons and as such may not reflect all diagnosis codes with ideal accuracy. Third, cost minimization assumes that health outcomes are equivalent between groups. We did not have appropriate data available to test this assumption. Finally, we do not know how CAM-using patients would have behaved if insurance coverage was not available for these visits; if they had substituted conventional care in place of CAM care, costs to the insurance company would likely have been higher, while if they had paid out-of-pocket for CAM care, costs to the insurance company would have been lower.

Conclusions

The conclusion of this analysis is that in a large group of insured individuals, patients who use CAM providers for some of their care have lower expenditures as a group than a matched group of patients who do not use CAM, and the difference in expenditures is related in large part to less inpatient care and less use of high-tech imaging.

Acknowledgments

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Disclosure Statement

No competing financial interests exist.

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The Association of Complementary and Alternative Medicine Use and Health Care Expenditures for Back and Neck Problems

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Christine M. Goertz, DC, PhD,*, and William E. Lafferty, MD#

Background: Health care costs associated with the use of complementary and alternative medicine (CAM) by patients with spine problems have not been studied in a national sample.

Objectives: To estimate the total and spine-specific medical expenditures among CAM and non-CAM users with spine problems.


Subjects: Adults (above 17 y) with self-reported neck and back problems who did or did not use CAM services.

Measures: Survey-weighted generalized linear regression and propensity matching to examine expenditure differences between CAM users and non-CAM users while controlling for patient, socioeconomic, and health characteristics.

Results: A total of 12,036 respondents with spine problems were included, including 4306 (35.8%) CAM users (40.8% in weighted sample). CAM users had significantly better self-reported health, education, and comorbidity compared with non-CAM users. Adjusted annual medical costs among CAM users was $424 lower (95% confidence interval: $240, $609; P < 0.001) for spine-related costs, and $796 lower (95% confidence interval: $121, $1470; P = 0.021) for total health care cost than among non-CAM users. Average expenditure for CAM users, based on propensity matching, was $526 lower for spine-specific costs (P < 0.001) and $298 lower for total health costs (P = 0.403). Expenditure differences were primarily due to lower inpatient expenditures among CAM users.

Conclusions: CAM users did not add to the overall medical spending in a nationally representative sample with neck and back problems. As the causal associations remain unclear in these cross-sectional data, future research exploring these cost differences might benefit from research designs that minimize confounding.

Key Words: back and neck pain, complementary and alternative medicine, expenditures

(CME 2012:00; 000–000)

Complementary and alternative medicine (CAM) includes professional services provided by chiropractic, homeopathic and naturopathic physicians, herbalists, and acupuncturists and massage therapists.1 As insurance coverage has become more widespread, CAM use among patients with spine problems has increased.2–4 For example, the number of adults in the United States who sought chiropractic care, the most common type of CAM used by people with spine problems, increased by 57% from 1997 to 2006.5

The financial impact of increased CAM use has been hotly debated. Some have argued that increased use of CAM services reduces the need for more expensive medical care; but others believe that CAM use increases costs because it supplements medical care rather than replacing it.6 Concerns that CAM coverage increases health care costs for the general population are not supported by claims data from large insurers or cost-effectiveness studies.7–13 However, such findings have not been examined using a national sample to estimate the impact of CAM use on total health care costs or for specific types of services (eg, inpatient, outpatient, prescriptions, and emergency services).
Although a finding of lower expenditures among CAM users with back pain would be consistent with the hypothesis that it obviates the need for more expensive medical care, it might also reflect differences in demographic, clinical, and treatment preferences between CAM and non-CAM users. For example, CAM users are younger, more physically active, less likely to be obese, and have higher educational status and income compared with non-CAM users. Using data from a nationally representative survey of health care utilization and cost, we estimated differences in the total and spine-specific annual expenditures among CAM and non-CAM users with self-reported spine problems. Two methods (linear regression and propensity score matching) were used to adjust these estimates for observed demographic, clinical, socioeconomic, and health status differences between CAM and non-CAM users.

METHODS

Data Source

We examined data from 2002 to 2008 using the Medical Expenditure Panel Survey (MEPS), an annual cross-sectional survey of noninstitutionalized US household health care utilization that is supplemented by provider and employer records. Participants in MEPS are a subsample of participants in the previous year’s National Health Interview Survey. The MEPS data include sampling weights and survey design variables that allow researchers to produce unbiased national estimates of expenditures, utilization, and self-reported health status.

We linked unique respondent identifiers in the demographic files to their separate “event” files containing medical encounter details for the following service categories: outpatient care, inpatient care, prescription medication files, and emergency department visits. We performed separate analyses for each type of service category. Many patients have multiple types of events (eg, both prescription medication and outpatient visits), so these subgroups of service categories are not mutually exclusive.

Average annual national estimates of utilization and expenditures were obtained by dividing the weighting variable by 7, as we combined data from 7 years. Figure 1 shows the case selection, the number of survey respondents, and the proportion of our sample who were CAM users.

Sample Selection

We used the International Classification of Disease, 9th revision, Clinical Modification (ICD-9-CM) to identify survey respondents with back and neck problems. We performed this analysis at the Agency for Healthcare Research and Quality’s Data Center to have access to fully specified ICD-9 codes. Publicly available MEPS files are truncated at the 3-digit level to protect respondent confidentiality. Previous studies have used ICD-9-CM codes for capturing spine conditions. Patient-reported medical conditions are translated into ICD-9-CM codes by MEPS survey administrators and provider surveys. We searched all available diagnosis codes for each respondent to identify those who had at least 1 medical encounter for a back or neck problem.

We then identified all inpatient, outpatient, emergency, and prescription events for these respondents. We searched all 3 diagnosis fields for each event record to identify those who were specifically related to a spine problem. The order that diagnosis codes were entered into the diagnosis fields did not matter.

Respondents were grouped into their most severe spinal diagnosis using a mutually exclusive hierarchy of spinal pathology that we developed with our clinical colleagues. In order of decreasing severity, this hierarchy included codes for scoliosis, spondylolisthesis, stenosis, herniated disk (with or without myelopathy), degeneration (eg, spondylisis), and spinal sprains or strains.

Exclusions

We excluded patients with nondegenerative spinal pathologies such as spinal fracture, vertebral dislocation, spinal cord injury, inflammatory spondylitis, myelopathy, osteoporosis, neurological impairment, osteomyelitis, or who had postoperative spinal care. We further excluded patients who had cancer, trauma, fractures, drug abuse, HIV or immune deficiencies, or were pregnant. Finally, we limited our analysis to those over age 17 y.

Classifying CAM Users

In 2002, MEPS introduced a new variable to describe 16 types of medical providers. Using this information, we defined a “CAM user” as someone having at least 1 visit to a doctor of chiropractic, massage therapist, homeopathic provider, acupuncturist, or “other CAM provider” (without further information). Our primary analysis focused on differences between CAM and non-CAM users. “Non-CAM” users were patients who had at least 1 conventional medical care visit for a spine-related problem (patients who self-reported back pain, but did not have any spine-specific medical visits were excluded). Categorizing a person as a CAM user was based on visits for all reasons, and was not necessarily related to the spine problem. We performed additional analyses focused on expenditure differences between CAM users and non-CAM users of chiropractic care exclusively, while excluding those who used other types of CAM (whether it was in addition to chiropractic care or not), because chiropractic care constituted approximately 75% of all CAM use.

Expenditures

Medical expenditures included all payments made by private insurance, Medicaid, Medicare, patient out-of-pocket costs and other recorded payment sources for office-based or hospital-based outpatient visits, inpatient stays, prescription medications, and emergency department visits. All services incurred during a hospital stay, including direct hospital care, diagnostic tests and procedures, imaging studies, and laboratory work were included as inpatient expenditures. Over-the-counter medications, services provided by free-standing radiology clinics, medical supplies or equipment, and dental expenditure were not included in the analysis.

Two costing methods, a direct and an incremental method, were used to estimate expenditures. These methods
have different underlying assumptions about how expenditures are related to spine problems. The direct method includes only those costs specifically identified as being spine-related (ie, the event is recorded with a spine-related diagnosis code). The incremental approach includes differences in cost for all care, whether or not they are specifically spine-related (eg, medical visits for treatment of depression). The difference in mean expenditure between CAM and non-CAM users for all medical care is “attributed” to differences due to CAM use. The incremental method is therefore a more holistic approach that includes potential excesses (or reductions) in expenditures among CAM users whether or not these differences are coded as being spine related. Both methods have been commonly reported in the literature for musculoskeletal and spinal conditions.18

Health Status

Multiple self-reported measures of health and functional status are collected from MEPS respondents. These include: the Short Form-12 Physical Component Summary and Mental Component Summary; perceived physical and mental health (dichotomized as “fair-poor” vs. “good-excellent”); any social, work, and physical functioning limitations (coded as “any” vs. “none”); and needed help for instrumental activities of daily living (IADL). Specifically, IADL asks respondents whether they need help with tasks such as taking medications, preparing meals, doing laundry, or going shopping. We dichotomized IADL to report the effect of having any limitation on function.

Covariates

Patient characteristics in MEPS include age, sex, race, ethnicity, education, marital status, US census region, health insurance status, family income, and whether the respondent was unemployed at any time during the year. Health insurance was coded as “Medicare,” “Medicaid,” “Private insurance only,” and “Uninsured.” Family income was defined relative to the federal poverty level (“poor,” “near poor,” “low,” “middle,” “high”). Finally, we used Quan’s version of the Charlson Index to account for comorbidity.19

Analysis

We identified the total number of survey respondents with spine problems, and grouped them based on whether or...
not they reported any health care utilization delivered by a CAM provider. Differences in the distribution of both patient characteristics and health status measures between CAM and non-CAM users were compared using $\chi^2$ comparisons on the weighted data (or by using $t$ test for age, a continuous variable). Within each service category we examined differences in the overall and spine-specific number of events between CAM and non-CAM users.

We then compared the unadjusted mean annual medical expenditures between CAM and non-CAM users for overall medical care (incremental methods), as well as spine-specific care (direct method). We estimated costs using a generalized linear regression model with a gamma distribution and log-link function to account for the skewed nature of cost data. The selection of this distributional family was informed by the Modified Park Test. To the unadjusted model we then sequentially added the variables for (1) patient and disease characteristics (age group, sex, insurance, comorbidity, and spinal diagnosis); (2) socioeconomic factors (income relative to the federal poverty level, education, work status, and US census region), and (3) self-reported health status (activity limitation and perceived health). The fully adjusted model included all potential covariates except when evidence of multicollinearity was found among health measures.

To present the average differences in adjusted costs between CAM and non-CAM users, we weighted each observation using $\beta$-coefficients associated with the corresponding variables from our regression models. This produced the normative cost for each patient based on the experience of patients with similar characteristics. We then reported the difference in these average costs between CAM and non-CAM users.

Because of selection bias concerns, we conducted additional analyses using propensity score matching to estimate differences in costs. Propensity score matching is a non-experimental sampling method that produces a non-CAM group whose distribution on observed covariates is similar to that of CAM users. We calculated a propensity score through an iterative process of balancing the properties among those with the same predicted probability for using CAM, based on the variables that were included in our fully adjusted regression model. To create this balance, only CAM and non-CAM users whose distributions of the propensity score overlapped were used as a basis for inferences (known as the “region of common support”). Each CAM user was then matched to a single non-CAM user with the most similar propensity score (known as “nearest-neighbor” matching). Matching on propensity score is more efficient than including a propensity score in a regression model, results in the least amount of selection bias, and is a common approach when test and control groups vary in size. The average treatment effect of CAM use on expenditure was then estimated using 1000 bootstrap samples from the matched sample. All analyses were performed using StataMP, version 11.0 (Stata Corp., College Station, TX) and incorporated weighting and design variables to account for multistate sampling methods. Hypothesis testing was conducted using an $\alpha$-level set at 0.05 based on the survey design degree of freedom. The study received a minimal risk approval from the University of Missouri-Kansas City institutional review board.

RESULTS

Population

Data were analyzed for 12,036 survey respondents for the years 2002 through 2008 who met our criteria, representing an estimated 18.0 million people annually (Fig. 1). Of these, 40.8% were CAM users. Chiropractic care was used by 75% of CAM users, followed by 18.8% who used massage, 6.9% using acupuncture, 4.5% for unspecified CAM providers, and 3.4% using homeopathic physicians. CAM users were significantly younger, and most prevalent in the midwest and least prevalent in the south. They were more likely to be white, non-Hispanic, privately insured, and employed, whereas less likely to be widowed, divorced, or separated (Table 1). CAM users also had higher family incomes, less comorbidity, and were more likely to be college-educated compared with non-CAM users.

The majority (60.9%) of patients had spine degenerative conditions, followed by herniated disk (23.8%), sprains and strains (10.7%), scoliosis (2.7%), stenosis (2.5%), and spondylolisthesis (0.4%). Degenerative disk disease and scoliosis were more commonly diagnosed among CAM than among non-CAM users. A diagnosis of disk herniation was less common among CAM users.

Health Status

Table 2 presents differences in self-reported health status between CAM and non-CAM respondents with spine problems. CAM users reported significantly better levels of perceived physical and mental health, as well as fewer physical, functional, social, and disabling limitations. The greatest differences were for physical functioning and perceived health status. For example, 17.8% of CAM users compared with 32.6% of non-CAM users reported physical functioning limitations ($P < 0.001$). Norm-based SF-12 physical and mental component scores were lower (worse) among non-CAM users. These differences in the SF-12 summary scores were statistically significant but not clinically meaningful. Moreover, their scores were not substantially lower than those of the general population.

Expenditures

Among respondents in our study, the mean unadjusted annual medical cost among CAM users was $2495 (95% CI: $1774, $3216) lower than that of non-CAM users ($P < 0.001$) for total health care costs (Table 3), and $685 (95% CI: $497, $872) lower for spine-specific health care services ($P < 0.001$; Table 4). After adjusting for patient characteristics, socioeconomic differences, and health status, the average annual medical cost for all health care was $796 lower (95% CI: $121, $1470) for CAM users than for non-CAM users ($P = 0.021$), and $424 (95% CI: $240, $609) lower for spine-specific health care services ($P < 0.001$).

Among CAM users, the proportion of outpatient expenditures that were specifically for CAM services was 21.7% (95% CI: 20.2, 23.4) for total health care, and 63.5% (95% CI: 59.3, 67.8) for spine-specific care.

Differences in both total and spine-specific expenditures were primarily attributed to significantly lower
### Table 1. Patient Characteristics Among CAM and Non-CAM Users With Self-reported Spine Problems Reported in MEPS 2002–2008

<table>
<thead>
<tr>
<th>Character</th>
<th>Overall</th>
<th>Non-CAM User</th>
<th>CAM User</th>
<th>P-value for Difference Between Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unweighted sample, 2002–2008</td>
<td>12,036</td>
<td>7,730 (64.2%)</td>
<td>4,306 (35.8%)</td>
<td>—</td>
</tr>
<tr>
<td>Annual weighted sample</td>
<td>18.0M</td>
<td>10.6M (59.1%)</td>
<td>7.4M (40.8%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Age, mean</td>
<td>48.9 (48.5, 49.3)</td>
<td>50.9 (50.4, 51.5)</td>
<td>48.2 (47.4, 48.9)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Sex, %</td>
<td>Male</td>
<td>44.1 (42.9, 45.2)</td>
<td>44.4 (42.9, 46.0)</td>
<td>43.5 (41.7, 45.4)</td>
</tr>
<tr>
<td>Region</td>
<td>Female</td>
<td>55.9 (54.8, 57.1)</td>
<td>55.6 (54.0, 57.1)</td>
<td>56.5 (54.6, 58.3)</td>
</tr>
<tr>
<td>Northeast</td>
<td>Midwest</td>
<td>18.8 (17.4, 20.4)</td>
<td>19.1 (17.5, 20.8)</td>
<td>18.4 (16.4, 20.6)</td>
</tr>
<tr>
<td>Southeast</td>
<td>West</td>
<td>32.3 (30.5, 34.2)</td>
<td>39.1 (37.0, 41.3)</td>
<td>22.6 (20.1, 25.2)</td>
</tr>
<tr>
<td>Race</td>
<td>White</td>
<td>86.6 (85.6, 87.5)</td>
<td>83.3 (82.0, 84.6)</td>
<td>91.4 (90.2, 92.4)</td>
</tr>
<tr>
<td>Black</td>
<td>African</td>
<td>8.2 (7.5, 8.9)</td>
<td>11.5 (10.5, 12.5)</td>
<td>3.4 (2.8, 4.2)</td>
</tr>
<tr>
<td>American Indian</td>
<td>Asian</td>
<td>0.8 (0.5, 1.1)</td>
<td>0.9 (0.6, 1.4)</td>
<td>0.6 (0.3, 1.0)</td>
</tr>
<tr>
<td>Alaska Natives</td>
<td>Alaska</td>
<td>2.5 (2.2, 3.0)</td>
<td>2.4 (2.0, 3.0)</td>
<td>2.7 (2.1, 3.4)</td>
</tr>
<tr>
<td>Multiple</td>
<td>Hispanic</td>
<td>0.2 (0.1, 0.3)</td>
<td>0.2 (0.1, 0.4)</td>
<td>0.2 (0.1, 0.4)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Marital status</td>
<td>1.7 (1.4, 2.1)</td>
<td>1.6 (1.3, 2.1)</td>
<td>1.8 (1.3, 2.4)</td>
</tr>
<tr>
<td>Married</td>
<td>Widowed</td>
<td>4.1 (3.7, 4.5)</td>
<td>4.3 (3.9, 4.7)</td>
<td>3.9 (3.6, 4.2)</td>
</tr>
<tr>
<td>Divorced</td>
<td>Separated</td>
<td>16.5 (15.6, 17.5)</td>
<td>15.5 (14.6, 16.7)</td>
<td>17.9 (16.3, 19.7)</td>
</tr>
<tr>
<td>Adapted Charlson Index</td>
<td>None</td>
<td>66.9 (65.6, 68.1)</td>
<td>63.3 (61.8, 64.7)</td>
<td>72.1 (70.0, 74.0)</td>
</tr>
<tr>
<td>1</td>
<td>Married</td>
<td>21.5 (20.5, 22.5)</td>
<td>23.5 (22.3, 24.6)</td>
<td>18.5 (16.9, 20.3)</td>
</tr>
<tr>
<td>2</td>
<td>Widowed</td>
<td>2.2 (1.9, 2.6)</td>
<td>2.7 (2.3, 3.2)</td>
<td>1.5 (1.1, 2.0)</td>
</tr>
<tr>
<td>3</td>
<td>Divorced</td>
<td>16.5 (15.6, 17.5)</td>
<td>15.5 (14.6, 16.7)</td>
<td>17.9 (16.3, 19.7)</td>
</tr>
<tr>
<td>4</td>
<td>Separated</td>
<td>60.6 (59.3, 61.8)</td>
<td>52.8 (51.1, 54.4)</td>
<td>71.9 (70.1, 73.6)</td>
</tr>
<tr>
<td>Health insurance</td>
<td>Medicaid</td>
<td>8.2 (7.5, 8.9)</td>
<td>9.8 (8.9, 10.7)</td>
<td>5.8 (4.9, 6.9)</td>
</tr>
<tr>
<td>Medicare</td>
<td>Private only</td>
<td>7.7 (7.0, 8.5)</td>
<td>7.8 (7.0, 8.8)</td>
<td>7.6 (6.5, 7.9)</td>
</tr>
<tr>
<td>Uninsured</td>
<td>Family income</td>
<td>10.1 (9.4, 10.9)</td>
<td>13.7 (12.7, 14.7)</td>
<td>5.0 (4.3, 5.9)</td>
</tr>
<tr>
<td>Poor</td>
<td>Near poor</td>
<td>11.7 (10.9, 12.5)</td>
<td>13.7 (12.7, 14.8)</td>
<td>8.8 (7.9, 9.8)</td>
</tr>
<tr>
<td>Low</td>
<td>Middle</td>
<td>29.7 (28.6, 30.9)</td>
<td>29.1 (27.7, 30.5)</td>
<td>30.7 (28.8, 32.5)</td>
</tr>
<tr>
<td>High</td>
<td>High school or less</td>
<td>44.6 (43.0, 46.2)</td>
<td>38.9 (37.0, 40.8)</td>
<td>52.9 (50.8, 55.1)</td>
</tr>
<tr>
<td>Education*</td>
<td>Any college</td>
<td>29.7 (28.6, 30.9)</td>
<td>29.1 (27.7, 30.5)</td>
<td>30.7 (28.8, 32.5)</td>
</tr>
<tr>
<td>Unemployed at any time during year</td>
<td>No</td>
<td>43.5 (42.9, 46.0)</td>
<td>47.2 (45.6, 48.9)</td>
<td>28.1 (26.4, 29.9)</td>
</tr>
<tr>
<td>5</td>
<td>Yes</td>
<td>60.0 (59.3, 61.8)</td>
<td>52.8 (51.1, 54.4)</td>
<td>71.9 (70.1, 73.6)</td>
</tr>
<tr>
<td>Back pain diagnosis category</td>
<td>Spondylosis</td>
<td>2.5 (2.1, 3.0)</td>
<td>3.2 (2.6, 3.8)</td>
<td>1.5 (1.1, 2.1)</td>
</tr>
<tr>
<td>Herniation without</td>
<td>Herniation with myelopathy</td>
<td>2.7 (2.3, 3.2)</td>
<td>2.2 (1.8, 2.7)</td>
<td>3.4 (2.7, 4.2)</td>
</tr>
<tr>
<td>Myelopathy</td>
<td>Degeneration</td>
<td>60.9 (59.7, 62.1)</td>
<td>56.4 (54.8, 57.9)</td>
<td>67.5 (65.5, 69.3)</td>
</tr>
<tr>
<td>Herniation without myelopathy</td>
<td>1.5 (1.1, 2.1)</td>
<td>3.2 (2.6, 3.8)</td>
<td>1.5 (1.1, 2.1)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Stenosis</td>
<td>Spondylosis</td>
<td>2.5 (2.1, 3.0)</td>
<td>3.2 (2.6, 3.8)</td>
<td>1.5 (1.1, 2.1)</td>
</tr>
<tr>
<td>Degeneration</td>
<td>Herniation with myelopathy</td>
<td>2.7 (2.3, 3.2)</td>
<td>2.2 (1.8, 2.7)</td>
<td>3.4 (2.7, 4.2)</td>
</tr>
</tbody>
</table>

*Total proportion is less than 100 because the answer was not ascertained for a small number of respondents.
CAM indicates complementary and alternative medicine; MEPS, Medical Expenditure Panel Survey.

inpatient expenditures among CAM users. After excluding the inpatient service category, we found no difference in total or spine-specific medical expenditures between CAM and non-CAM users.

All but 60 of the 12,036 survey respondents were included in the region of common support (see the Methods section), and were included in the propensity score matching analyses. In contrast to the regression analysis, the average treatment effect for CAM use on total expenditures was not statistically significant. The total annual expenditures among CAM users were $298 lower than non-CAM users for total care (P = 0.403). However, even with the propensity-matching method, CAM users had significantly lower spine-specific expenditures ($526 lower than non-CAM users; P < 0.001).

Similar patterns of utilization and costs were observed when we considered only patients who did or did not use chiropractic care, while excluding all other types of CAM use from the analysis.

<table>
<thead>
<tr>
<th>Health Measure</th>
<th>Overall (n = 12,036)</th>
<th>Non-CAM Users (n = 7730)</th>
<th>CAM Users (n = 4306)</th>
<th>P-value for Difference Between Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norm-based SF-12, mean (95% CI) (0–100 point scale, higher score indicates better health)</td>
<td>Physical Component Summary</td>
<td>43.0 (42.7, 43.4)</td>
<td>40.5 (40.1, 41.0)</td>
<td>46.6 (46.1, 47.1)</td>
</tr>
<tr>
<td></td>
<td>Mental Component Summary</td>
<td>48.8 (48.5, 49.1)</td>
<td>47.8 (47.4, 48.9)</td>
<td>50.2 (49.8, 50.7)</td>
</tr>
<tr>
<td>Perceived health status, % (95% CI)</td>
<td>Better than fair</td>
<td>76.0 (74.9, 77.1)</td>
<td>69.2 (67.6, 70.7)</td>
<td>85.9 (84.6, 87.1)</td>
</tr>
<tr>
<td></td>
<td>Fair or poor</td>
<td>24.0 (22.9, 25.1)</td>
<td>30.8 (29.3, 32.4)</td>
<td>14.1 (12.9, 15.4)</td>
</tr>
<tr>
<td>Mental health status, % (95% CI)</td>
<td>Better than fair</td>
<td>88.1 (87.3, 88.9)</td>
<td>85.0 (83.9, 86.0)</td>
<td>92.7 (91.7, 93.6)</td>
</tr>
<tr>
<td></td>
<td>Fair or poor</td>
<td>11.9 (11.1, 12.7)</td>
<td>15.0 (14.0, 16.1)</td>
<td>7.3 (6.4, 8.3)</td>
</tr>
<tr>
<td>Social limitation, % (95% CI)</td>
<td>No</td>
<td>88.0 (87.1, 88.8)</td>
<td>84.5 (83.2, 85.7)</td>
<td>93.0 (92.1, 93.9)</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>12.0 (11.2, 13.0)</td>
<td>15.5 (14.3, 16.8)</td>
<td>7.0 (6.1, 7.9)</td>
</tr>
<tr>
<td>Any work, school or home limitations, % (95% CI)</td>
<td>No</td>
<td>80.3 (79.3, 81.4)</td>
<td>74.1 (72.6, 75.6)</td>
<td>89.3 (88.1, 90.4)</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>19.7 (18.7, 20.8)</td>
<td>25.9 (24.4, 27.4)</td>
<td>10.7 (9.6, 11.9)</td>
</tr>
<tr>
<td>Physical functioning limitations, % (95% CI)</td>
<td>No</td>
<td>73.4 (72.2, 74.6)</td>
<td>67.4 (65.8, 68.9)</td>
<td>82.2 (80.7, 83.6)</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>26.6 (25.4, 27.8)</td>
<td>32.6 (31.1, 34.3)</td>
<td>17.8 (16.4, 19.3)</td>
</tr>
<tr>
<td>Limitations with instrumental activities of daily living, % (95% CI)</td>
<td>No</td>
<td>94.2 (93.6, 94.7)</td>
<td>92.1 (91.2, 92.9)</td>
<td>97.3 (96.6, 97.8)</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>5.8 (5.3, 6.4)</td>
<td>7.9 (7.1, 8.8)</td>
<td>2.7 (2.2, 3.4)</td>
</tr>
</tbody>
</table>

CAM indicates complementary and alternative medicine; CI, confidence interval; MEPS, Medical Expenditure Panel Survey.

CONCLUSIONS
We observed significantly lower overall and spine-specific medical costs among CAM users compared with non-CAM users in a regression model adjusted for patient characteristics, diagnosis, socioeconomic factors, and health status. The lower total costs among CAM users was primarily attributable to their lower expenditures for inpatient services. After excluding inpatient expenditures, there was no difference in spine-specific or overall medical expenditures between CAM and non-CAM users.

As with any nonrandomized study, selection bias is a concern when comparing costs of CAM users with non-CAM users. We found that CAM users had significantly better self-reported measures of health status, lower comorbidity, more private insurance, and higher socioeconomic status compared with non-CAM users. These factors are also likely to


<table>
<thead>
<tr>
<th>Component</th>
<th>Total Expenditures</th>
<th>Inpatient</th>
<th>Outpatient</th>
<th>Prescription</th>
<th>Emergency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unadjusted</td>
<td>$8383</td>
<td>$2675</td>
<td>$3070</td>
<td>$2086</td>
<td>$318</td>
</tr>
<tr>
<td>CAM user</td>
<td>$5888</td>
<td>$1381</td>
<td>$3024</td>
<td>$1227</td>
<td>$183</td>
</tr>
<tr>
<td>Difference in expenditures</td>
<td>$–2495 (P&lt;0.001)</td>
<td>$–1295 (P&lt;0.001)</td>
<td>$–46 (P=0.754)</td>
<td>$–859 (P&lt;0.001)</td>
<td>$–136 (P&lt;0.001)</td>
</tr>
<tr>
<td>Age, sex, race and insurance, primary diagnosis, and comorbidity adjusted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-CAM user</td>
<td>$7948</td>
<td>$2517</td>
<td>$2976</td>
<td>$1952</td>
<td>$310</td>
</tr>
<tr>
<td>CAM user</td>
<td>$6518</td>
<td>$1609</td>
<td>$3160</td>
<td>$1421</td>
<td>$196</td>
</tr>
<tr>
<td>Difference in expenditures</td>
<td>$–1430 (P&lt;0.001)</td>
<td>$–908 (P=0.005)</td>
<td>$184 (P=0.203)</td>
<td>$–531 (P&lt;0.001)</td>
<td>$–114 (P&lt;0.001)</td>
</tr>
<tr>
<td>+ Region and income, education, employment adjusted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-CAM user</td>
<td>$7898</td>
<td>$2496</td>
<td>$3004</td>
<td>$1913</td>
<td>$307</td>
</tr>
<tr>
<td>CAM user</td>
<td>$6575</td>
<td>$1628</td>
<td>$3125</td>
<td>$1474</td>
<td>$199</td>
</tr>
<tr>
<td>Difference in expenditures</td>
<td>$–1322 (P&lt;0.001)</td>
<td>$–868 (P=0.001)</td>
<td>$121 (P&lt;0.001)</td>
<td>$–439 (P&lt;0.001)</td>
<td>$–108 (P&lt;0.001)</td>
</tr>
<tr>
<td>+ Self-reported health status measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-CAM user</td>
<td>$7682</td>
<td>$2414</td>
<td>$2949</td>
<td>$1848</td>
<td>$300</td>
</tr>
<tr>
<td>CAM user</td>
<td>$6887</td>
<td>$1742</td>
<td>$2204</td>
<td>$1569</td>
<td>$210</td>
</tr>
<tr>
<td>Difference in expenditures</td>
<td>$–796 (P=0.021)</td>
<td>$–672 (P=0.006)</td>
<td>$255 (P=0.056)</td>
<td>$–279 (P=0.001)</td>
<td>$–90 (P&lt;0.001)</td>
</tr>
</tbody>
</table>

CAM indicates complementary and alternative medicine; MEPS, Medical Expenditure Panel Survey.

<table>
<thead>
<tr>
<th>Treatment effect for CAM use (CAM user−non-CAM user)</th>
<th>Total Expenditures*</th>
<th>Inpatient</th>
<th>Outpatient</th>
<th>Prescription</th>
<th>Emergency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unadjusted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-CAM user</td>
<td>$1913</td>
<td>$716</td>
<td>$1098</td>
<td>$6</td>
<td>$93</td>
</tr>
<tr>
<td>CAM user</td>
<td>$1228</td>
<td>$160</td>
<td>$1037</td>
<td>$1</td>
<td>$30</td>
</tr>
<tr>
<td>Treatment effect for CAM use (CAM user−non-CAM user)</td>
<td>$−685 (P&lt;0.001)</td>
<td>$−556 (P&lt;0.001)</td>
<td>$−62 (P=0.255)</td>
<td>$−5 (P&lt;0.001)</td>
<td>$−63 (P&lt;0.001)</td>
</tr>
<tr>
<td>Age, sex, race and insurance, primary diagnosis, and comorbidity adjusted Non-CAM user</td>
<td>$1832</td>
<td>$671</td>
<td>$1065</td>
<td>$6</td>
<td>$90</td>
</tr>
<tr>
<td>CAM user</td>
<td>$1345</td>
<td>$225</td>
<td>$1083</td>
<td>$1</td>
<td>$35</td>
</tr>
<tr>
<td>Treatment effect for CAM use (CAM user−non-CAM user)</td>
<td>$−487 (P&lt;0.001)</td>
<td>$−446 (P=0.001)</td>
<td>$18 (P=0.741)</td>
<td>$−4 (P&lt;0.001)</td>
<td>$−55 (P&lt;0.001)</td>
</tr>
<tr>
<td>+ Region and income, education, employment adjusted Non-CAM user</td>
<td>$1840</td>
<td>$680</td>
<td>$1066</td>
<td>$6</td>
<td>$89</td>
</tr>
<tr>
<td>CAM user</td>
<td>$1343</td>
<td>$215</td>
<td>$1090</td>
<td>$1</td>
<td>$37</td>
</tr>
<tr>
<td>Treatment effect for CAM use (CAM user−non-CAM user)</td>
<td>$−497 (P&lt;0.001)</td>
<td>$−465 (P&lt;0.001)</td>
<td>$24 (P=0.662)</td>
<td>$−5 (P&lt;0.001)</td>
<td>$−52 (P&lt;0.001)</td>
</tr>
<tr>
<td>+ Self-reported health status measures Non-CAM user</td>
<td>$1811</td>
<td>$672</td>
<td>$1045</td>
<td>$6</td>
<td>$88</td>
</tr>
<tr>
<td>CAM user</td>
<td>$1387</td>
<td>$227</td>
<td>$1121</td>
<td>$2</td>
<td>$38</td>
</tr>
<tr>
<td>Treatment effect for CAM use (CAM user−non-CAM user)</td>
<td>$−424 (P&lt;0.001)</td>
<td>$−446 (P&lt;0.001)</td>
<td>$76 (P=0.152)</td>
<td>$−4 (P&lt;0.001)</td>
<td>$−50 (P&lt;0.001)</td>
</tr>
<tr>
<td>Propensity score matched†</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment effect for CAM use (CAM user−non-CAM user)</td>
<td>$−526 (P&lt;0.001)</td>
<td>$−422 (P&lt;0.001)</td>
<td>$−17 (P=0.808)</td>
<td>$−2 (P=0.021)</td>
<td>$−85 (P=0.003)</td>
</tr>
</tbody>
</table>

*Individual service categories do not sum to the total expenditure column due to averaging.
†Propensity score matches were drawn from 11,976 cases within the “region of common support” (see text). A total of 4289 CAM users were matched on propensity score to 2812 non-CAM users using the nearest neighbor technique.
CAM indicates complementary and alternative medicine; MEPS, Medical Expenditure Panel Survey.

be related to expenditures. Thus, the observed cost differences associated with CAM use may differ from those that would be observed in a randomized comparison. Indeed, we found that adjusting our analysis for observed differences largely attenuated the cost differences between CAM users and non-CAM users. In addition, by further matching CAM users to non-CAM users who had similar propensity scores, we found that the magnitude of the effect for CAM use on total health care expenditures was largely attenuated compared with the effects found in the regression models, and that this difference was no longer statistically significant. Nevertheless, even with propensity matching, spine-specific expenditures were significantly lower among CAM users compared with non-CAM users.

A major strength of our study is that it is based on a large and nationally representative sample, rather than on data from a select clinical study or from a specific health network. However, there are some limitations. Although the use of ICD-9-CM codes is common in spine research, the codes lack specific clinical detail such as disease severity and duration. Even with multiple adjustments for observed group differences, unobserved factors may exist that could explain the remaining differences in costs. It is uncertain whether unmeasured confounding factors could explain the observed difference in costs between CAM and non-CAM users. Finally, differences in health care utilization and expenditures between CAM and non-CAM users may be the cause or consequence of differences in health status. Cross-sectional data preclude causal inferences regarding CAM use and health status, but allow us to examine the association of CAM use with expenditures after adjusting for differences in health status. The self-reported health status measures in this study may not reflect baseline values as these data may have been collected either before or after spine-related visits. Future research exploring these differences might benefit from randomized designs or statistical methods (eg, instrumental variable analysis) that further seek to identify and minimize unmeasured confounding.

Our findings are generally consistent with other studies that have reported that CAM use does not significantly increase overall medical spending.9–12 Our study is the first to generalize these findings to a nationally representative sample. Whether expanding CAM coverage will retain a budget neutral impact is unclear. On the basis of cost effectiveness, the UK National Institute for Health and Clinical Excellence (NICE) has recommended expanded use of early conservative treatments in response to back pain, and a recent study has shown reduced rates of surgery among those receiving early physical therapy for common acute back pain.23,24 In contrast, a Medicare demonstration project recently reported that expanding chiropractic services to include payment for physical examinations, imaging and additional manual services significantly increased costs.25 However, concerns exist regarding the generalizability of this finding. Costs for all users with neuromusculoskeletal complaints were significantly higher in demonstration sites when compared with control sites, both before and during the demonstration period. Furthermore, the majority of additional expenditures occurred at...
one site (Illinois, primarily Chicago and its suburbs). Costs in other demonstration areas either decreased or increased only slightly when compared with control sites.

Our findings are consistent with the hypothesis that, after accounting for clear differences between CAM and non-CAM users, expenditures for CAM users are not higher than those of non-CAM users, and even suggest possible cost savings. Discretionary clinician decisions are the predominant driver of medical spending for back pain; and, despite evidence-based clinical guidelines that recommend conservative treatment approaches, trends suggest increases in the use of advanced imaging, epidural steroid injections, opioid analgesics, and surgical treatments for those with back pain. These services are often provided with the expectation that they will obviate the need for more invasive and longer duration therapies. As the health care costs for spine-related pain continue to grow in the absence of evidence of corresponding improvements in population-based outcomes, there is a major need for research that clarifies how the timing, frequency, and effectiveness of CAM services affect subsequent rates of surgical spinal surgery, opioid prescription, epidural steroid injections, and other expensive and invasive treatments for patients with back pain.

REFERENCES

ACUPUNCTURE COST EFFECTIVE FOR LOWER BACK PAIN
13 September 2010

Acupuncture has been shown to be cost-effective in the treatment of chronic low back pain.

A report on the Cost Effectiveness of Complementary Medicines by Access Economics that was commissioned by the National Institute Complementary Medicine (NICM) was released earlier today.

According to the report, there is clear evidence that acupuncture treatment for chronic low back pain can result in direct health savings of $3,066,302 per disability adjusted life year (DALY) when used as adjunct to standard care.

This study provides proof that acupuncture is a cost effective treatment. It is noted that, as the study included only savings from direct health costs, and did not include indirect costs (such as loss of productivity at work), the full cost savings are expected to be even higher.

Significantly higher per DALY costs were avoided where individualised acupuncture was provided (>3M) compared with a standardised treatment ($1.7M).

Qualified acupuncturists are trained to provide effective individualised treatments that are tailored to the individual’s actual condition, as opposed to a standardised treatment that does not take into account the individual presentation.

The Australian Acupuncture and Chinese Medicine Association Ltd (AACMA) would like to congratulate NICM and Access Economics on the high quality of this report.

AACMA represents over 80% of qualified acupuncture and Chinese medicine professionals in Australia. Our current entry requirement is the completion of an AACMA approved four to five year full-time bachelor degree program majoring in acupuncture and/or Chinese herbal medicine. AACMA believes that short training courses in acupuncture are unable to equip the practitioner to provide competent safe and effective individualised acupuncture treatments.

The Chinese medicine profession will become a nationally registered profession from 1 July 2012. This will require acupuncturists to be registered with the future Chinese Medicine Board of Australia if they are to continue to practise in the profession.

According to Judy James, CEO ‘National registration cannot arrive too soon. Without national registration, AACMA is unable to prevent unqualified, unsafe or unethical practitioners of acupuncture from offering their services to the community. National registration can only be good for public health and safety and will provide a mechanism to remove unsafe, unethical and incompetent persons from the profession’.

Members of the public can locate a qualified AACMA accredited Acupuncturist by contacting the AACMA National Practitioner Referral Service (1300 725 334) or via the Find a Practitioner service at www.acupuncture.org.au.

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p: 07 3324 2599 ext 16
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e: events@acupuncture.org.au  w: www.acupuncture.org.au
t: www.twitter.com/AACMA  f: www.facebook.com/AACMA
Evaluating the ROI and Cost Effectiveness of Acupuncture

Acupuncture and Oriental medicine is one of the fastest growing forms of health care in the United States. This explosion is due to the recognition by both patients and regulators of the safety, effectiveness and low costs associated with this form of patient care.

In recent years, numerous research studies have been conducted to document and measure the health benefits, savings and cost effectiveness of utilizing acupuncture in patient treatment plans.

Acupuncture Treatments Led to a Decrease in Days Missed at Work

One hundred twenty patients with migraines were randomly assigned to an acupuncture group (AG) or conventional drug therapy group. The AG patients received acupuncture twice a week for a maximum of thirty treatments. Severity and frequency of headache and days of missed work were evaluated 12 months after admission. The AG group had an absence rate of 1120 working days per year while the drug therapy group had a total absence rate of 1404 working days per year.

The Results: Cost savings of $35,480 per year to the company, for the sixty patients receiving acupuncture versus those in drug therapy. 

$57,000 in Hospital-Related Fees Saved as a Result of Acupuncture

29 patients with severe osteoarthritis of knee, each awaiting arthroplasty surgery, were randomly selected to receive a course of acupuncture treatment, or be placed on a waiting list to receive similar acupuncture treatment starting 9 weeks later. Of the 29 patients treated with acupuncture, 7 were able to cancel their scheduled surgeries.


Nearly $1 Million Saved from Decreased Days in Hospital or Nursing Home

Half of 78 stroke patients receiving standard rehabilitative care were randomly selected to receive adjunctive acupuncture treatment. Patients given the acupuncture protocol recovered faster and to a greater extent, spending an average of 88 days per patient in the hospital/nursing homes, compared to an average of 161 days without acupuncture.

**The Results:** Cost savings of $26,000 per patient, or total of $936,000 in avoided hospital fees. Johansson K et al (1993), “Can sensory stimulation improve the functional outcome in stroke patients?” Neurology 43:2189-2192.

Acupuncture for Angina Pectoris Saves Money and Reduces Hospitalization Time

One hundred five patients with angina pectoris received acupuncture and self-care education in addition to their pharmaceutical treatment. Seventy-three participants had been recommended for invasive procedures. The treatment protocol consisted of 12 visits over a four-week period that included an acupuncture treatment and an education session. A 90% reduction in hospitalization and a 70% reduction in surgery resulted.

Research: Acupuncture Is Both Cost and Medically Effective

Two recent research reports find that acupuncture is an effective treatment for several types of chronic pain and has the added advantage of being less costly than standard medical care.

According to a story in the Sept. 10, 2012 edition of Medscape Medical News, a "meta-analysis" performed by lead author Andrew J. Vickers, DPhil, attending research methodologist, Department of Epidemiology and Biostatistics, Memorial Sloan-Kettering Cancer Center, New York, New York found that "found that about 50% of patients who got acupuncture had improvement in pain compared with 30% who didn’t get acupuncture and 42.5% who had sham acupuncture."

The report, Acupuncture for Chronic Pain Individual Patient Data Meta-analysis, originally appeared in the *Archives of Internal Medicine*.

The findings contradict a series of controversial reports in the last three years that have contended that "sham acupuncture" is as effective as real acupuncture.

However, the article notes that for other types of interventions for chronic pain "the placebo effect is typically about one third of the effect of the treatment, (but) ’in acupuncture, it looks like it’s two thirds,’ said Dr. Vickers. ’That’s quite a large benefit and that’s what the patient will actually experience in real clinical practice,’ where the decision is not whether to have true or sham acupuncture but whether to get a referral for acupuncture or not."

The study itself was "a systematic review to identify randomized controlled trials (RCTs) of acupuncture for chronic pain in which allocation concealment was determined unambiguously to be adequate. Individual patient data meta-analyses were conducted using data from 29 of 31 eligible RCTs, with a total of 17 922 patients analyzed."

It concluded that "Acupuncture is effective for the treatment of chronic pain and is therefore a reasonable referral option." It reviewed the effects of acupuncture on four chronic pain conditions: back and neck pain, osteoarthritis, chronic headache, and shoulder pain. In his interview Vickers said that acupuncture is also a
cost-effective intervention. "Those studies have typically found that the health gain per dollar spent is well under the typical threshold."

**Acupuncture Found Valuable in Treatment of Knee Pain**

A British study, which focussed specifically on acupuncture’s cost-effectiveness in treating chronic knee pain, concluded that one-third of patients with knee osteoarthritis and were candidates for total knee replacement surgery had achieved long-term symptom relief after two years. The study, published on Sept. 12, 2012, determined that the acupuncture treatments had saved at least 100,000 pounds (about $162,000) per year within the study group.


About 80% of patients with knee osteoarthritis who attended MSK CATS (musculoskeletal clinical assessment and treatment services) in 2008 and were considered candidates for TKR surgery were willing to try acupuncture first. Ninety patients were screened for acupuncture in this NHS service offering treatment in groups. Of these 90 patients, we know that at least 31 had not had TKR within the following 2 years."

Typical total knee replacement surgery in the UK costs about 5000 pounds (roughly $8100), the report stated.

It concluded: "Although TKR (Total Knee Replacement) is successful in the sense that revision rates are low, as many as 15% of patients experience severe knee pain 3–4 years later and 18% are dissatisfied with the results. Experts recommend that all conservative options should be offered before resorting to surgery.

"The evidence published on acupuncture in patients with knee osteoarthritis shows that it is safe and effective in reducing pain and improving function, thus qualifying it as an appropriate conservative treatment for this condition."

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http://www.acupuncturetoday.com/mpacms/at/article.php?id=32651&no_paginate=true&no_b=true
Valerie DeLaune, LAc
Alaskan Natural Care Clinic /
Alaskan Acupuncture
P.O. Box 3082
Homer, AK 99603

Dear Ms. DeLaune,

This is in response to your letter received by the Division on August 18, 2009, requesting that acupuncturists be allowed to prescribe and perform massage therapy for retired state employees.

I am unable to make the change you request because the AlaskaCare™ Health Plan is protected constitutionally from diminishment or impairment. Any changes made to the plan must maintain cost neutrality according to the Supreme Court decision in RPEA v. Duncan.

Your presentation material included information that you acquired from Premera Blue Cross Blue Shield of Alaska (Premera). Premera was acting as a third party administrator for the State of Alaska, Department of Administration under contract for claim processing. While the Premera Health Plan may cover acupuncturist’s massage therapy, State of Alaska retirees are covered by AlaskaCare™ Retiree Health Plan.

Thank you for taking the time to submit your request. Because the Health Plan is a constitutionally protected benefit, changes are only undertaken after thorough analysis. Although changes are not easily made, your request has been duly noted for consideration.

If you have any other questions, please contact Fran Compton, Benefits Specialist, at (907) 465-1847 or by email at fran.compton@alaska.gov.

Sincerely,

Patrick Shier
Director

PS/fc
Alaskan Natural Care Clinic / Alaskan Acupuncture
PO Box 3082
Homer, AK 99603
907-226-2273
907-226-2298 FAX
TriggerPointRelief.com

Pat Shier
Director, State of Alaska Retirement & Benefits
PO Box 110203
Juneau, AK 99811-0203

August 3, 2009

Dear Director Shier:

This letter is to formally request that acupuncturists be allowed to prescribe and perform massage therapy for State retired employees. Blue Cross’s medical director had made the determination that I could prescribe and perform massage and manual therapy, because it was under the scope of my license (please see attached e-mails), and this determination applied to the former State retired insurance plan, among others.

Well’s Fargo administrators initially agreed verbally on the phone, but this policy is now “currently under review,” according to a Well’s Fargo employee. Supposedly the plan was not supposed to change under the new administrator, but this constitutes a change in coverage. Meanwhile, patients have started to cancel appointments, not knowing whether they will be covered or not. This is a pressing concern both for this clinic, and for the State retired patients it serves. Between acupuncture and medical massage services, over the past 20 years, I have saved the State thousands of dollars in medical costs by averting surgeries and other more costly medical procedures, not to mention reducing missed time from work and increased employee productivity.

In looking at the various Alaska statutes governing different providers, the only providers that have specific language allowing prescriptions for massage or other types of bodywork, are medical doctors and chiropractors. (Please see the attached table for the applicable statutes/regulations.) The acupuncture statute does not prohibit me from writing prescriptions. In fact, I do have a prescription pad and regularly prescribe massage and manual therapy which is allowed by other insurance companies (please see attached prescription pad.) NEA Alaska, which covers the health insurance of most teachers in the State, does list acupuncturists in their definition of “physician,” and they do allow me to perform and prescribe massage therapy (please see attachment.)
The IRS recognizes acupuncturists as covered medical providers (see attachment Publication 502).

I request that acupuncturists be allowed to prescribe and perform services under 97140 and 97124 for the State retiree health care plan, per the scope of our licensing Statute.

Sincerely,

Valerie DeLaune, LAc
Licensed Acupuncturist

cc:  Representative Wes Keller, Co-chair HSS  
     Representative Bob Herron, Co-chair HSS  
     Senator Bettye Davis, Chair HSS  
     Senator Gary Stevens, Senate President  
     Representative Paul Seaton, member, HSS  
     Representative Beth Kertula, House Minority Leader  
     Representative Sharon Cissna, co-chair Health Caucus  
     Senator Donald Olson, co-chair Health Caucus  
     Senator Johnny Ellis, Senate Majority Leader
7 AAC 43.035. Eligible providers

(a) Except as provided in (c) of this section for mental health services, the following types of provider are eligible to enroll with the department and bill directly for services rendered:

(1) a person currently licensed by the state to practice medicine, osteopathy, dentistry, optometry, chiropractic, podiatry, occupational therapy, or audiology;

(2) a speech pathologist licensed under AS 08.11;

(3) a hospital currently licensed by the department;

(4) a long-term care facility providing skilled nursing care and intermediate care;

(5) a licensed pharmacy;

(6) a home health services agency certified by the department;

(7) a company or individual not excluded in (b) of this section, supplying

(A) medical transportation, ambulance services, oxygen, eyeglasses, prosthetic devices, durable medical equipment, supplies, respiratory therapy assessment visits, and home infusion therapy; or

(B) items reimbursable under 7 AAC 43.1055 as specialized medical equipment and supplies;

(8) a provider of screening services under 7 AAC 43.452.

(9) repealed 5/5/93;

(10) a rural health clinic certified by the Medicare program;

(11) a licensed outpatient surgical care center;

(12) a licensed physical therapist;

(13) a facility providing services for end stage renal disease;

(14) a person currently licensed by the state as an advanced nurse practitioner;

(15) a personal care agency;

(16) a hospice care agency certified by the department;

(17) residential psychiatric treatment center for persons age 21 and under;

(18) a home and community-based services provider, as defined at 7 AAC 43.1110;

(19) a care coordination agency provider, as defined at 7 AAC 43.1110;

(20) repealed 5/15/2004;
(21) a residential supported living services provider, as defined at 7 AAC 43.1110;

(22) a substance abuse rehabilitative service provider approved by the department;

(23) a federally qualified health center (FQHC),

(24) a licensed direct-entry midwife;

(25) a person currently licensed by the state as a dietician or nutritionist;

(26) a hospital, clinic, or other type of health care facility or program operated by

(A) the United States Department of Health and Human Services, Indian Health Service;

(B) an Indian tribe as described in 25 U.S.C. 450b(e) and 25 U.S.C. 458aaa(b);

(C) a tribal organization as defined in 25 U.S.C. 450b(f); or

(D) an inter-tribal consortium as defined in 25 U.S.C. 458aaa(a)(5) or established by federal law;

(27) a provider of in-state freestanding or portable x-ray services who meets the requirements of 7 AAC 43.940(a)(1) or (2);

(28) a provider of behavioral rehabilitation services for severely emotionally disturbed children;

(29) a hearing aid dealer.

(b) The services of a licensed or unlicensed practitioner not specifically provided for in this chapter are not covered under the Medicaid program in this state.

(c) The following types of provider are eligible to enroll with the department and bill directly for outpatient mental health services:

(1) a physician licensed to practice in the state in which service is provided;

(2) a community mental health clinic; or

(3) a mental health physician clinic.

(d) Notwithstanding (a) of this section, a federal employee assigned to a tribal hospital, clinic, or other type of health care facility or program enrolled under (a)(26) of this section is exempt from state licensure. However, to be enrolled as a Medicaid provider in the state, the employee must provide proof of current active licensure from a jurisdiction in the United States. For purposes of this subsection, "jurisdiction in the United States" means a state, the District of Columbia, the Commonwealth of Puerto Rico, the United States Virgin Islands, or Guam.

History: Eff. 8/18/79, Register 71; am 12/31/92, Register 124; em am 1/8/93 - 5/7/93, Register 128; am 5/5/93, Register 126; am 6/5/93, Register 126; am 12/19/93, Register 128; am 2/23/94, Register 129; am 9/28/95, Register 135; readopt 8/7/96, Register 139; am 2/12/99, Register 149; am 3/3/2001, Register 157; am 5/18/2004, Register 170; am 9/29/2005, Register 175; am 12/16/2005, Register 176; am 1/1/2006, Register 177; am 5/23/2008, Register 186

Authority: AS 47.05.010

AS 47.07.030
ACUPUNCTURE: REVIEW AND ANALYSIS OF REPORTS ON CONTROLLED CLINICAL TRIALS
Acknowledgements

The World Health Organization acknowledges its indebtedness to the experts who participated in the WHO Consultation on Acupuncture held in Cervia, Italy in 1996, at which the selection criteria for the data included in this publication were set. Special thanks are due to Dr Zhu-Fan Xie, Honorary Director of the Institute of Integrated Medicines, First Hospital of Beijing Medical University, China, who drafted, revised and updated this report. Further, Dr Xie made numerous Chinese language documents available in English. We also thank Dr Hongguang Dong, Geneva University Hospital, Switzerland for providing additional information.

Appreciation is extended to the Norwegian Royal Ministry of Health and Social Affairs for providing the financial support to print this review.
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Background

Over its 2500 years of development, a wealth of experience has accumulated in the practice of acupuncture, attesting to the wide range of diseases and conditions that can be effectively treated with this approach. Unlike many other traditional methods of treatment, which tend to be specific to their national or cultural context, acupuncture has been used throughout the world, particularly since the 1970s. In recognition of the increasing worldwide interest in the subject, the World Health Organization (WHO) conducted a symposium on acupuncture in June 1979 in Beijing, China. Physicians practising acupuncture in different countries were invited to identify the conditions that might benefit from this therapy. The participants drew up a list of 43 suitable diseases. However, this list of indications was not based on formal clinical trials conducted in a rigorous scientific manner, and its credibility has been questioned.

The past two decades have seen extensive studies on acupuncture, and great efforts have been made to conduct controlled clinical trials that include the use of “sham” acupuncture or “placebo” acupuncture controls. Although still limited in number because of the difficulties of carrying out such trials, convincing reports, based on sound research methodology, have been published. In addition, experimental investigations on the mechanism of acupuncture have been carried out. This research, while aimed chiefly at answering how acupuncture works, may also provide evidence in support of its effectiveness.

In 1991, a progress report on traditional medicine and modern health care was submitted by the Director-General of WHO to the Forty-fourth World Health Assembly. The report pointed out that in countries where acupuncture forms part of the cultural heritage, its use in an integrated approach to modern and traditional medicine presents no difficulty. However, in countries where modern Western medicine is the foundation of health care, the ethical use of acupuncture requires objective evidence of its efficacy under controlled clinical conditions.

In 1996, a draft report on the clinical practice of acupuncture was reviewed at the WHO Consultation on Acupuncture held in Cervia, Italy. The participants recommended that WHO should revise the report, focusing on data from controlled clinical trials. This publication is the outcome of that process.

---

Objectives

The objective of this publication is to provide a review and analysis of controlled clinical trials of acupuncture therapy, as reported in the current literature, with a view to strengthening and promoting the appropriate use of acupuncture in health care systems throughout the world. Information on the therapeutic mechanisms of acupuncture has also been incorporated.

Since the methodology of clinical research on acupuncture is still under debate, it is very difficult to evaluate acupuncture practice by any generally accepted measure. This review is limited to controlled clinical trials that were published up to 1998 (and early 1999 for some journals), in the hope that the conclusions will prove more acceptable. Such trials have only been performed for a limited number of diseases or disorders. This should not be taken to mean, however, that acupuncture treatment of diseases or disorders not mentioned here is excluded.

Use of the publication

This publication is intended to facilitate research on and the evaluation and application of acupuncture. It is hoped that it will provide a useful resource for researchers, health care providers, national health authorities and the general public.

It must be emphasized that the list of diseases, symptoms or conditions covered here is based on collected reports of clinical trials, using the descriptions given in those reports. Only national health authorities can determine the diseases, symptoms and conditions for which acupuncture treatment can be recommended.

The data in the reports analysed were not always clearly recorded. We have made every effort to interpret them accurately, in some cases maintaining the original wording in the text and summary table presented here. Research on traditional medicine, including acupuncture is by no means easy. However, researchers should be encouraged to ensure the highest possible standards of study design and reporting in future research in order to improve the evidence base in this field.

Dr Xiaorui Zhang
Acting Coordinator
Traditional Medicine (TRM)
Department of Essential Drugs
and Medicines Policy (EDM)
World Health Organization
1. General considerations

1.1 Definition

Acupuncture literally means to puncture with a needle. However, the application of needles is often used in combination with moxibustion—the burning on or over the skin of selected herbs—and may also involve the application of other kinds of stimulation to certain points. In this publication the term “acupuncture” is used in its broad sense to include traditional body needling, moxibustion, electric acupuncture (electro-acupuncture), laser acupuncture (photo-acupuncture), microsystem acupuncture such as ear (auricular), face, hand and scalp acupuncture, and acupressure (the application of pressure at selected sites).

1.2 Need for evaluation

Acupuncture originated in China many centuries ago and soon spread to Japan, the Korean peninsula and elsewhere in Asia. Acupuncture is widely used in health care systems in the countries of this region; it is officially recognized by governments and well received by the general public.

Although acupuncture was introduced to Europe as long ago as the early seventeenth century, scepticism about its effectiveness continues to exist in countries where modern Western medicine is the foundation of health care, especially in those where acupuncture has not yet been widely practised. People question whether acupuncture has a true therapeutic effect, or whether it works merely through the placebo effect, the power of suggestion, or the enthusiasm with which patients wish for a cure. There is therefore a need for scientific studies that evaluate the effectiveness of acupuncture under controlled clinical conditions.

This publication reviews selected studies on controlled clinical trials. Some of these studies have provided incontrovertible scientific evidence that acupuncture is more successful than placebo treatments in certain conditions. For example, the proportion of chronic pain relieved by acupuncture is generally in the range 55–85%, which compares favourably with that of potent drugs (morphine helps in 70% of cases) and far outweighs the placebo effect (30–35%) (1–3). In addition, the mechanisms of acupuncture analgesia have been studied extensively since the late 1970s, revealing the role of neural and humoral factors.

1.3 Evaluation methodology

Unlike the evaluation of a new drug, controlled clinical trials of acupuncture are extremely difficult to conduct, particularly if they have to be blind in design and the acupuncture has to be compared with a placebo. Various “sham” or “placebo” acupuncture procedures have been designed, but they are not easy to
perform in countries such as China where acupuncture is widely used. In these countries, most patients know a great deal about acupuncture, including the special sensation that should be felt after insertion or during manipulation of the needle. Moreover, acupuncturists consider these procedures unethical because they are already convinced that acupuncture is effective. In fact, most of the placebo-controlled clinical trials have been undertaken in countries where there is scepticism about acupuncture, as well as considerable interest.

A more practical way to evaluate the therapeutic effect of acupuncture is to compare it with the effect of conventional therapy through randomized controlled trials or group studies, provided that the disease conditions before treatment are comparable across the groups, with outcome studies developed for all patients.

Because of the difficulty of ruling out the placebo effect, a comparative study with no treatment as the control may not be convincing in the evaluation of acupuncture practice. Retrospective surveys, in which the effect of acupuncture therapy is compared with past treatments, may not be of significance either, particularly if they have not been well designed. Non-comparative studies are certainly of little significance, particularly when acupuncture is used for the treatment of a self-limited disease. However, if rapid improvement can be achieved in the treatment of a long-standing, chronic disease, or if there is definite improvement in a disease that is generally recognized as intractable to conventional treatment, the effect of acupuncture should be viewed in a more favourable light, even when a well-designed, controlled study has not been carried out.

Another difficulty in evaluating acupuncture practice is that the therapeutic effect depends greatly on the proficiency of the acupuncturists—their ability and skill in selecting and locating the acupuncture points and in manipulating the needles. This may partly explain the disparities or inconsistencies in the results reported by different authors, even when their studies were carried out on equally sound methodological bases.

Evaluating acupuncture practice and arriving at generally accepted conclusions is no easy task, therefore. While effectiveness is doubtless of the utmost importance, other factors, including safety, cost, availability and the condition of local health services must also be considered. Given the same effectiveness, these other factors may lead to different evaluations of acupuncture in different countries and areas. However, conclusions are needed that apply to worldwide use, particularly for countries and areas where proper development of acupuncture practice would bring a great deal of benefit. Evaluations should not therefore be confined to those diseases for which modern conventional treatments are inadequate or ineffective.

Because of the success of surgical procedures carried out under acupuncture analgesia, the treatment of pain with acupuncture has been extensively studied. For other conditions often treated with acupuncture, there are fewer reports that have adequate methodology.
1.4 Safety

Generally speaking, acupuncture treatment is safe if it is performed properly by a well-trained practitioner. Unlike many drugs, it is non-toxic, and adverse reactions are minimal. This is probably one of the chief reasons why acupuncture is so popular in the treatment of chronic pain in many countries. As mentioned previously, acupuncture is comparable with morphine preparations in its effectiveness against chronic pain, but without the adverse effects of morphine, such as dependency.

Even if the effect of acupuncture therapy is less potent than that of conventional treatments, acupuncture may still be worth considering because of the toxicity or adverse effects of conventional treatments. For example, there are reports of controlled clinical trials showing that acupuncture is effective in the treatment of rheumatoid arthritis (4–6), although not as potent as corticosteroids. Because, unlike corticosteroids, acupuncture treatment, does not cause serious side-effects, it seems reasonable to use acupuncture for treating this condition, despite the difference in effectiveness.

1.5 Availability and practicability

The availability and practicability of acupuncture are also important factors to consider. The advantages of acupuncture are that it is simple, convenient and has few contraindications. Although the success rate of acupuncture therapy in treating kidney stones, for example, is confirmed by comparative studies with other therapies (7), it is by no means as high as that of surgical intervention. However, acupuncture treatment of kidney stones is still worth recommending because of its simplicity, which makes it more acceptable to patients.

There are also instances where acupuncture is not more practicable than conventional therapy. For example, the effectiveness of acupuncture treatment of acute bacillary dysentery has been shown to be comparable with that of furazolidone (8–10), but this is of rather academic significance because oral administration of furazolidone or other antidysenteric drugs is more convenient.

The conditions of the health service in a given country or area should also be considered in evaluating acupuncture practice. In developing countries, where medical personnel and medicines are still lacking, the need for acupuncture may be considerable and urgent; proper use of this simple and economic therapy could benefit a large number of patients. On the other hand, in developed countries, where the health system is well established, with sophisticated technology, adequate personnel and a well-equipped infrastructure, acupuncture might be considered to be of great value in only a limited number of conditions. It could still serve as a valuable alternative treatment for many diseases or conditions for which modern conventional treatments are unsuccessful. It is also valuable in situations where the patient is frightened of the potential risks or adverse effects of modern conventional treatments. In fact, in some developed countries, the diseases for which patients seek help from acupuncturists tend to be beyond the scope of orthodox medicine.
1.6 Studies on therapeutic mechanisms

Clinical evaluations indicate whether the therapy works; research on the
mechanisms involved indicates how it works and can also provide important
information on efficacy. Knowing that acupuncture is effective and why makes
the practitioner confident in its use, and also allows the technique to be used in a
more appropriate way.

The clinical evaluation may precede studies on the mechanisms, or vice versa.
For acupuncture, in most instances the clinical effect has been tested first. Use of
the technique may then be further expanded on the basis of the results of
research on the mechanisms. For example, experimental studies of the effect of
acupuncture on white blood cells led to a successful trial of the treatment of
leukopenia caused by chemotherapy.

To date, modern scientific research studies have revealed the following actions of
acupuncture:

- inducing analgesia
- protecting the body against infections
- regulating various physiological functions.

In reality, the first two actions can also be attributed to the regulation of
physiological functions. The therapeutic effects of acupuncture are thus brought
about through its regulatory actions on various systems, so that it can be
regarded as a nonspecific therapy with a broad spectrum of indications,
particularly helpful in functional disorders. Although it is often used as a
symptomatic treatment (for pain, for instance), in many cases it actually acts on
one of the pathogenic links of a disease.

Although different acupuncture points and manipulations may have an effect
through different actions, the most important factor that influences the direction
of action is the condition of the patient. Numerous examples reveal that the
regulatory action of acupuncture is bi-directional. Acupuncture lowers the blood
pressure in patients with hypertension and elevates it in patients with
hypotension; increases gastric secretion in patients with hypoacidity, and
decreases it in patients with hyperacidity; and normalizes intestinal motility
under X-ray observation in patients with either spastic colitis or intestinal
hypotonia (11). Therefore, acupuncture itself seldom makes the condition worse.
In most instances, the main danger of its inappropriate application is neglecting
the proper conventional treatment.

Since its therapeutic actions are achieved by mobilization of the organism’s own
potential, acupuncture does not produce adverse effects, as do many drug
therapies. For example, when release of hydrocortisone plays an important role
in the production of a therapeutic effect, the doses of this substance released by
acupuncture are small and finely regulated, thereby avoiding the side-effects of
hydrocortisone chemotherapy (12). On the other hand—and for the same
reason—acupuncture has limitations. Even under conditions where acupuncture
is indicated, it may not work if the mobilization of the individual’s potential is
not adequate for recovery.
1.7 Selection of clinical trial reports

In recent decades, numerous clinical trials have been reported; however, only formally published articles that meet one of the following criteria are included in this review:

- randomized controlled trials (mostly with sham acupuncture or conventional therapy as control) with an adequate number of patients observed;
- nonrandomized controlled clinical trials (mostly group comparisons) with an adequate number of patients observed and comparable conditions in the various groups prior to treatment.

In many published placebo-controlled trials, sham acupuncture was carried out by needling at incorrect, theoretically irrelevant sites. Such a control really only offers information about the most effective sites of needling, not about the specific effects of acupuncture (13). Positive results from such trials, which revealed that genuine acupuncture is superior to sham acupuncture with statistical significance, provide evidence showing the effectiveness of acupuncture treatment. On the other hand, negative results from such trials, in which both the genuine and sham acupuncture showed considerable therapeutic effects with no significant difference between them, can hardly be taken as evidence negating the effectiveness of acupuncture. In the latter case, especially in treatment of pain, most authors could only draw the conclusion that additional control studies were needed. Therefore, these reports are generally not included in this review.

The reports are first reviewed by groups of conditions for which acupuncture therapy is given (section 2). The clinical conditions covered have then been classified into four categories (section 3):

1. Diseases, symptoms or conditions for which acupuncture has been proved—through controlled trials—to be an effective treatment.
2. Diseases, symptoms or conditions for which the therapeutic effect of acupuncture has been shown, but for which further proof is needed.
3. Diseases, symptoms or conditions for which there are only individual controlled trials reporting some therapeutic effects, but for which acupuncture is worth trying because treatment by conventional and other therapies is difficult.
4. Diseases, symptoms or conditions in which acupuncture may be tried provided the practitioner has special modern medical knowledge and adequate monitoring equipment.

Section 4 provides a tabulated summary of the controlled clinical trials reviewed, giving information on the number of subjects, the study design, the type of acupuncture applied, the controls used and the results obtained.
2. Review of clinical trial reports

2.1 Pain

The effectiveness of acupuncture analgesia has already been established in controlled clinical studies. As mentioned previously, acupuncture analgesia works better than a placebo for most kinds of pain, and its effective rate in the treatment of chronic pain is comparable with that of morphine. In addition, numerous laboratory studies have provided further evidence of the efficacy of acupuncture’s analgesic action as well as an explanation of the mechanism involved. In fact, the excellent analgesic effects of acupuncture have stimulated research on pain.

Because of the side-effects of long-term drug therapy for pain and the risks of dependence, acupuncture analgesia can be regarded as the method of choice for treating many chronically painful conditions.

The analgesic effect of acupuncture has also been reported for the relief of eye pain due to subconjunctival injection (14), local pain after extubation in children (15), and pain in thromboangiitis obliterans (16).

2.1.1 Head and face

The use of acupuncture for treating chronic pain of the head and face has been studied extensively. For tension headache, migraine and other kinds of headache due to a variety of causes, acupuncture has performed favourably in trials comparing it with standard therapy, sham acupuncture, or mock transcutaneous electrical nerve stimulation (TENS) (17–27). The results suggest that acupuncture could play a significant role in treating such conditions.

Chronic facial pain, including craniomandibular disorders of muscular origin, also responds well to acupuncture treatments (28–31). The effect of acupuncture is comparable with that of stomatognathic treatments for temporomandibular joint pain and dysfunction. Acupuncture may be useful as complementary therapy for this condition, as the two treatments probably have a different basis of action (2, 32).

2.1.2 Locomotor system

Chronically painful conditions of the locomotor system accompanied by restricted movements of the joints are often treated with acupuncture if surgical intervention is not necessary. Acupuncture not only alleviates pain, it also reduces muscle spasm, thereby increasing mobility. Joint damage often results from muscle malfunction, and many patients complain of arthralgia before any
changes are demonstrable by X-ray. In these cases, acupuncture may bring about a permanent cure. Controlled studies on common diseases and conditions in this category have been reported by different authors, with favourable results for acupuncture treatments compared with standard therapy, delayed-treatment controls, control needling, mock TENS, or other sham acupuncture techniques. The conditions concerned include cervical spondylitis or neck pain due to other causes (33–37), periarthritis of the shoulder (38, 39) fibromyalgia (40), fasciitis (41), epicondylitis (tennis elbow) (42–44), low back pain (45–49), sciatica (50–53), osteoarthritis with knee pain (54–56), and radicular and pseudoradicular pain syndromes (57). In some reports, comparison was made between standard care and acupuncture as an adjunct to standard care. The conclusion from one such randomized controlled trial was that acupuncture is an effective and judicious adjunct to conventional care for patients with osteoarthritis of the knee (58).

Rheumatoid arthritis is a systemic disease with extra-articular manifestations in most patients. In this disease, dysfunction of the immune system plays a major role, which explains the extra-articular and articular features. Acupuncture is beneficial in the treatment of rheumatoid arthritis (4–6). While acupuncture may not improve the damage that has been done to the joints, successful pain relief has been verified in the majority of controlled studies (58). The action of acupuncture on inflammation and the dysfunctional immune system is also beneficial (5, 59).

2.1.3 Gout

In a randomized controlled trial, blood-pricking acupuncture was compared with conventional medication (allopurinol). The acupuncture group showed greater improvement than the allopurinol group. In addition, a similar reduction of uric acid levels in the blood and urine of both groups was noted (60). Plum-blossom needling (acupuncture using plum-blossom needles), together with cupping (the application to the skin of cups which are then depressurized), has been recommended for treating gouty arthritis (61).

2.1.4 Biliary and renal colic

Acupuncture is suitable for treating acute pain, provided the relief of pain will not mask the correct diagnosis, for which other treatments may be needed. Biliary and renal colic are two conditions for which acupuncture can be used not only as an analgesic but also as an antispasmodic. In controlled studies on biliary colic (62–64) and renal colic (7, 65, 66), acupuncture appears to have advantages over conventional drug treatments (such as intramuscular injection of atropine, pethidine, anisodamine (a Chinese medicine structurally related to atropine, isolated from *Anisodus tanguticus*), bucinazine (also known as bucinperazine) or a metamizole-camylofin combination). It provides a better analgesic effect in a shorter time, without side-effects. In addition, acupuncture is effective for relieving abdominal colic, whether it occurs in acute gastroenteritis or is due to gastrointestinal spasm (67).
2.1.5 Traumatic or postoperative pain

For traumas such as sprains, acupuncture is not only useful for relieving pain without the risk of drug dependence, but may also hasten recovery by improving local circulation (68–70). Acupuncture analgesia to relieve postoperative pain is well recognized and has been confirmed in controlled studies (71–76). The first successful operation under acupuncture analgesia was a tonsillectomy. This was, in fact, inspired by the success of acupuncture in relieving post-tonsillectomy pain. Post-tonsillectomy acupuncture was re-evaluated in a controlled study in 1990, which not only showed prompt alleviation of throat pain, but also reduction in salivation and promotion of healing in the operative wound (76).

2.1.6 Dentistry

Acupuncture has been widely used in dentistry. There are reports of randomized controlled trials on the analgesic effect of acupuncture for postoperative pain from various dental procedures, including tooth extraction (77–78), pulp devitalization (79), and acute apical periodontitis (80). According to a systematic review of papers on the use of acupuncture in dentistry published between 1966 and 1996, 11 out of 15 randomized controlled studies with blind controls, appropriate statistics and sufficient follow-up showed standard acupuncture to be more effective than a placebo or sham acupuncture. It was therefore concluded that acupuncture should be considered a reasonable alternative or supplement to current dental practice as an analgesic (81). Its use in the treatment of temporomandibular dysfunction was also supported in these studies.

2.1.7 Childbirth

In childbirth, acupuncture analgesia is useful for relieving labour pain and can significantly reduce the duration of labour (82). In the case of weakened uterine contractions, acupuncture increases the activity of the uterus. Episiotomy and subsequent suturing of the perineum can also be carried out with acupuncture analgesia. In addition, the avoidance of narcotics is advantageous for newborn infants.

2.1.8 Surgery

Acupuncture analgesia has the following advantages in surgical operations. It is a very safe procedure compared with drug anaesthesia; no death has ever been reported from acupuncture analgesia. There is no adverse effect on physiological functions, whereas general anaesthesia often interferes with respiration and blood pressure, for example. There are fewer of the postoperative complications that sometimes occur after general anaesthesia, such as nausea, urinary retention, constipation, and respiratory infections. The patient remains conscious and able to talk with the medical team during the operation so that injury of the facial and recurrent laryngeal nerve can be avoided. However, remaining conscious may be a disadvantage if the patient cannot tolerate the emotional stress of the procedure.
While the benefits of acupuncture analgesia are many, the disadvantages must also be considered. The use of acupuncture is more time-consuming and in many cases may fail to bring about complete analgesia. It is often not suitable for abdominal surgery because suppression of visceral pain and muscle relaxation may be inadequate. It is not suitable in children because few children will tolerate the needling and keep still during major surgery. Also, the surgeon must be quick and deft, so that the operation can be finished before the patient develops tolerance to the needling.

In conclusion, acupuncture analgesia as an anaesthetic for surgical procedures is indicated in selected patients who show a good response to needling in the preoperative trial, particularly when they may be a poor surgical risk under conventional general anaesthesia. The use of adjuvant drugs to potentiate the effect of the acupuncture treatment is preferred. Acupuncture can also be used in combination with general anaesthesia to reduce the dosage of anaesthetic agents.

2.2 Infections

Acupuncture has been reported to be effective for treating acute bacillary dysentery (8–10). Its effect is comparable with that of conventional medicines such as furazolidone, but the use of acupuncture in the first line of defence against this disease is not practicable—daily performance of needling procedures is much more complicated than administering oral drug therapy. However, when no antidysenteric agent is available or the patient is allergic to antidysenteric agents, acupuncture may occasionally be used.

The results of research on the effects of acupuncture treatments that stimulate the immune system suggest that acupuncture may be of use in conjunction with other medical therapies for treating infections (84).

The effect of acupuncture on the immune system has been tested in hepatitis B virus carriers. In a comparative study, acupuncture–moxibustion is apparently superior to herbal medications in producing hepatitis B e core antibodies and reducing hepatitis B surface antigen (85). For epidemic haemorrhagic fever, compared with steroid and supportive treatments, moxibustion shortened the period of oliguria and promoted the reduction of kidney swelling (86).

Acupuncture may be useful in treating pertussis (whooping cough), by relieving cough as well as promoting a cure (87).

2.3 Neurological disorders

In the neurological field, headaches, migraines and neuralgia are the common painful conditions treated with acupuncture. Strokes and their sequelae are another major indication for acupuncture. Early treatment of paresis after stroke has proved highly effective.

Because improvement in the effects of stroke also occurs naturally, there has been some doubt about the contribution of acupuncture. In recent years, however, a number of controlled clinical evaluations have been undertaken in stroke
2. Review of clinical trial reports

patients. For example, in randomized controlled studies, acupuncture treatment of hemiplegia due to cerebral infarction gave better results than conventional medication (88–93) and physiotherapy (94, 95). There were also beneficial effects when acupuncture was used as a complement to rehabilitation (96–98).

In one study, patients with ischaemic cerebrovascular disease treated with acupuncture were compared with patients treated with conventional drugs. Nerve function, as evaluated by electroencephalographic map and somatosensory evoked potential, showed a much more marked improvement in the patients treated with acupuncture (89). This has been further confirmed by experimental studies. In the laboratory, a rat model of reversible middle cerebral artery occlusion was used. The somatosensory evoked potential recorded before and after the occlusion showed that electric acupuncture markedly promoted the recovery of the amplitude of the P1–N1 wave (to 58.6% in the electric acupuncture group in contrast to 25.5% in the control group after 7 days) (93). In addition, recent clinical studies suggest that the effectiveness of acupuncture therapy can be further promoted by using temporal acupuncture (99, 100).

Comparative studies have shown acupuncture treatments to be as effective for treating hemiplegia due to cerebral haemorrhage as for that due to cerebral infarction. Since early treatment with physiotherapy is unsatisfactory, it is advisable to use acupuncture as the primary treatment. Even in hemiplegia of long duration, remarkable improvements can often be achieved. Hemiplegia due to other causes, such as brain surgery, can also be improved by acupuncture (101). Aphasia caused by acute cerebrovascular disorders can also be treated with acupuncture (102).

Although acupuncture is effective for many painful conditions, there are only a few reports on post-herpetic neuralgia. Two of them were based on randomized clinical trials and provided completely opposite results (103, 104). Evaluation of acupuncture in the treatment of this painful condition therefore awaits further study.

Peripheral nervous disorders are often treated with acupuncture. For example, good effects for Bell’s palsy have been reported in randomized controlled trials (105, 106). Facial spasm is another peripheral nervous disorder for which acupuncture treatment may be indicated. For this condition it has been shown that wrist–ankle acupuncture is significantly better than traditional body acupuncture (107).

Coma is a serious condition that can hardly be cured by acupuncture alone, but in a comparative study of two groups of patients with similar levels of coma, a significantly greater number of patients in the acupuncture group had a 50% or greater neurological recovery than those in the control group. This suggests that it is reasonable to incorporate acupuncture along with other therapeutic and supportive measures in the treatment of the comatose patient (108).

Insomnia can also be treated successfully with acupuncture. In randomized control trials, both auricular acupressure and auricular acupuncture had a hypnotic effect (109, 110).
2.4 Respiratory disorders

Acupuncture is often used in treating respiratory disorders. Allergic rhinitis is one of the major indications. In controlled studies, it has been shown that acupuncture is more effective than antihistamine drugs in the treatment of allergic rhinitis (111–115). Acupuncture’s lack of side-effects is a distinct advantage in treating this condition; however, its protective effect against allergen-provoked rhinitis has not been verified (116).

The acute symptoms of tonsillitis can be effectively relieved with acupuncture (117). Since there is no information about the incidence of complications secondary to tonsillitis treated with acupuncture, in clinical practice antibiotic therapy should still be considered the treatment of choice for acute tonsillitis. For sore throats from other causes, acupuncture treatment provides definite benefits, in contrast to a placebo and acupuncture refusal (118).

Although there are conflicting results from controlled trials in treating bronchial asthma with acupuncture, the majority of the reports suggest that acupuncture is effective (119–123) and that the effect is related to the points used (122). While bronchial asthma is not cured by acupuncture, it may be substantially relieved, at least for short periods of time. The success rates quoted in the literature are 60–70%. Acupuncture has a limited role in treating acute asthmatic attacks since it is a weak bronchodilator, but it may serve as a prophylactic measure over the long term. Controlled trials have shown that acupuncture brings about modest improvement in objective parameters, with significant subjective improvement (124). Prospective randomized single-blind studies of the effects of real and sham acupuncture on exercise-induced and metacholine-induced asthma revealed that real acupuncture provided better protection than did sham acupuncture (119), but it failed to modulate the bronchial hyperreactivity to histamine (125). Corticosteroid-dependent bronchial asthma may respond better to acupuncture treatment than other types: the required dosage of corticosteroids gradually decreases during the first weeks of acupuncture treatment (126). Acupuncture may also provide symptomatic improvement in the late stages of bronchial asthma, where there are complications of disabling breathlessness due to impaired lung function (127).

2.5 Digestive disorders

Epigastric pain is a common symptom in diseases of the stomach, including peptic ulcer, acute and chronic gastritis, and gastric spasm. Acupuncture provides satisfactory relief of epigastric pain—significantly better than injections of anisodamine or morphine plus atropine, as shown in randomized controlled trials (128, 129). For gastrointestinal spasm, acupuncture is also superior to injections of atropine (130), and for gastrokinetic disturbances, the effectiveness of acupuncture is comparable with that of conventional medicine (domperidone) (131).

Another common symptom of digestive disorders is nausea and vomiting. This can be due to a disordered function of the stomach, but it is more often a symptom or sign of generalized disorders. Morning sickness, postoperative vomiting, and nausea and vomiting related to chemotherapy are frequently
encountered clinically. In all these conditions, acupuncture at point neiguān (PC6) seems to have a specific antiemetic effect. A recent systematic review of trials using acupuncture for antiemesis showed that 11 of 12 randomized placebo-controlled trials, involving nearly 2000 patients, supported this effect. The reviewed papers showed consistent results across different investigators, different groups of patients, and different forms of acupuncture stimulation (132).

Irritable colon syndrome and chronic ulcerative colitis are often difficult to treat with conventional medication. For these diseases, acupuncture may serve as a complementary or alternative therapeutic measure (133, 134).

Because of its analgesic effect, acupuncture can be used in endoscopic examinations, e.g. in colonoscopy. It has been reported that the effect of acupuncture to relieve pain and discomfort during the examination is comparable with that of scopolamine or pethidine with fewer side-effects (135, 136).

There has been extensive research on the effect of acupuncture on the digestive system, with extensive data showing its influence on the physiology of the gastrointestinal tract, including acid secretion, motility, neurohormonal changes and changes in sensory thresholds. Many of the neuroanatomic pathways of these effects have been identified in animal models (137).

Acupuncture shows good analgesic and antispasmodic effects on the biliary tract and, as indicated previously, can be recommended for treatment of biliary colic (62–64). It also has a cholangic action, which has been demonstrated in experimental studies. In the treatment of biliary colic due to gallstones, acupuncture is not only effective for relieving the colicky pain, but is also useful for expelling the stones. Satisfactory results were reported when electric acupuncture was used in combination with oral administration of magnesium sulfate (138). Acupuncture treatment is also worth trying for chronic cholecystitis, even if there is acute exacerbation (139).

2.6 Blood disorders

Among various blood disorders, leukopenia is the most suitable for acupuncture treatment. In controlled studies, acupuncture has been shown to be more effective than batilol and/or cysteine phenylacetate in the treatment of leukopenia due to chemotherapy (140–142) or benzene intoxication (143, 144).

2.7 Urogenital disorders

Urinary retention due to functional disorders, with no organic obstruction, is often treated with acupuncture. For postpartum or postoperative urinary retention, successful micturition usually occurs immediately after one session of needling (66, 145). It is probably for this reason that controlled studies on this subject have been neglected. However, there has been a report of a randomized controlled trial on traumatic retention of urine, a condition more complicated than postpartum or postoperative retention. In this trial, the efficacy of
Acupuncture was remarkably superior to that of intramuscular injection of neostigmine bromide (146).

Acupuncture is not only useful for relieving renal colic, but also for expelling urinary stones (if they are not too large), because it dilates the ureter. Satisfactory results have been obtained in comparisons with conventional medication (7), but it is better to use acupuncture as a complementary measure in conjunction with medication or lithotripsy.

Sexual disorders are often treated with acupuncture, but conclusive results based on methodologically sound clinical studies are still lacking. Acupuncture was shown to be more effective than placebo in the treatment of non-organic male sexual dysfunction, but the improvement was not statistically significant (147). In another randomized controlled trial, acupuncture had a better effect than the control in the treatment of defective ejaculation (no ejaculation during intercourse) (148).

Acupuncture may also be helpful to patients with chronic prostatitis. As shown in a randomized controlled trial, acupuncture was superior to oral sulfamethoxazole in relieving symptoms and improving sexual function (149).

In women, it has been shown that acupuncture can lower urethral pressure and relieve urethral syndrome (150, 151). Acupuncture has also been successfully used as a prophylaxis against recurrent lower urinary tract infections (152).

### 2.8 Gynaecological and obstetric disorders

Primary dysmenorrhoea, a painful condition, is one of the major indications for acupuncture in the field of gynaecological disorders. The beneficial effect of acupuncture on this condition has been repeatedly reported in controlled trials (153, 154). Acupuncture relieves pain and also regulates the motility of the uterus to facilitate menstrual discharge and further alleviate the pain.

Premenstrual syndrome is characterized by cyclical mood changes and is a common condition in women of fertile age. Acupuncture seems to be helpful to patients with this syndrome. In a controlled study, the majority of the patients receiving acupuncture gained relief from symptoms and no recurrence in the six-month follow-up (155).

Although acupuncture was reported to be effective in the treatment of female anovular infertility (156), no methodologically sound, controlled trials have been reported. However, the mechanism of acupuncture in regulating abnormal function of the hypothalamic–pituitary–ovarian axis has been demonstrated in experimental studies. The data suggest that electric acupuncture with relative specificity of acupuncture points could influence some genetic expression in the brain, thereby normalizing the secretion of certain hormones, such as gonadotropin-releasing hormone, luteinizing hormone and estradiol (157).

Acupuncture is also worth trying in the treatment of female infertility due to inflammatory obstruction of the fallopian tubes, where it seems to be superior to conventional therapy with intrauterine injection of gentamicin, chymotrypsin and dexamethasone (158).

Acupuncture in pregnant women should be undertaken with care. Needling at some points (namely, on the abdomen and lumbosacral region), as well as strong
stimulation of certain distant points, such as hégū (LI4), sānyìnjiāo (SP6) and zhīyīn (BL67), may cause miscarriage. However, this action is useful if induction of labour is desired, such as in prolonged pregnancy; the effect is comparable with that of oxytocin by intravenous drip (159–161).

In early pregnancy, acupuncture at the upper limb points can be used for the prevention and treatment of morning sickness. The efficacy of acupressure at nèiguān (PC6) has been reported repeatedly in placebo-controlled studies (13, 162, 163). In order to prevent miscarriage induced by needling, acupressure is recommended for the treatment of morning sickness.

Various methods of acupuncture, such as pressure at ear points and moxibustion at zhīyīn (BL67) or zǔlǐngqí (GB41), have been used to correct abnormal fetal position during the last three months of pregnancy. The success rates in groups treated with these methods were much higher than the occurrence of spontaneous version or in groups treated with knee-chest position or moxibustion at non-classical points (164–167).

Acupuncture stimulates milk secretion after childbirth and can be used to treat deficient lactation due to mental lability or depression. It has been observed that acupuncture elevates the blood prolactin level in women with deficient milk secretion after childbirth; in the majority of cases, lactation starts as the blood prolactin level increases (168). The clinical use of acupuncture to promote lactation has also been demonstrated in a randomized controlled study (169).

### 2.9 Cardiovascular disorders

Acupuncture is suitable for treating primary hypotension (170, 171) and early essential hypertension (172–176). It has been reported that the influence of acupuncture on hypertension might be related to its regulatory effect on the level of serum nitrogen monoxide (177). For primary hypotension, acupuncture seems to be more effective than general tonics. For mild and moderate essential hypertension, the hypotensive effect of acupuncture is much more potent than that of placebos and is comparable with that of certain conventional hypotensive agents. In addition, acupuncture is often effective for relieving subjective symptoms, and it has no side-effects.

Encouraging results have been reported for a number of controlled studies on the treatment of heart disease with acupuncture, particularly in psychosomatic heart disorders, such as cardiac neurosis (178). In coronary heart disease, acupuncture has been shown by various authors to be effective in relieving angina pectoris. Its beneficial influence has been demonstrated during coronary arteriography. Cardiological, neurophysiological and psychological observations, made in mutually independent studies, indicated that acupuncture improved the working capacity of the heart in patients with angina pectoris and activated autoregulatory cardiovascular mechanisms in healthy persons (179). In controlled studies, acupuncture has provided significantly greater improvement in symptoms and cardiac work capacity than either placebo (180–182) or conventional medication, such as glyceryl trinitrate (183, 184). Dilation of the coronary artery during acupuncture has been shown to be comparable with that observed during intracatheter injection of isosorbide dinitrate (185). In addition, acupuncture has a beneficial effect on the left ventricular function of patients.
with coronary heart disease, and is also more effective than nifedipine and isosorbide dinitrate (186). Nèiguān (PC6) is the point most commonly used for treating cardiac disorders. The beneficial effect of acupuncture at this point has been demonstrated by serial equilibrium radionuclide angiography (187). Acupuncture also produces haemorrhheological improvement (188).

In order to avoid unexpected accidents, however, special attention should be paid to the treatment of heart disease. Acupuncturists must be able to differentiate between angina pectoris and acute myocardial infarction.

2.10 Psychiatric disorders and mental disturbances

Acupuncture is being increasingly used in psychiatric disorders. The effect of acupuncture on depression (including depressive neurosis and depression following stroke) has been documented repeatedly in controlled studies (189–194). Acupuncture is comparable with amitriptyline in the treatment of depression but has fewer side-effects. In addition, acupuncture has been found to be more effective in depressive patients with decreased excretion of 3-methyl-4-hydroxy-phenylglycol (the principal metabolite of the central neurotransmitter norepinephrine), while amitriptyline is more effective for those with inhibition in the dexamethasone suppression test (192). This suggests that these two therapies work through different mechanisms. There have also been reports that, in controlled trials of schizophrenia treatment, acupuncture might have a better effect than chlorpromazine (194, 195).

Acupuncture (auricular acupressure) is much more effective than psychotherapy in the treatment of competition stress syndrome, and is worth further study (196).

The possible use of auricular acupuncture as a treatment for opium dependence was first noted in 1973 (197). It was found that some of the patients whose postoperative pain was relieved by acupuncture were hiding a dependence on opium. In 1979, a study carried out jointly in Hong Kong and London showed that endorphin concentrations were raised by acupuncture in heroin-dependent persons, resulting in successful suppression of withdrawal symptoms. Since then, acupuncture has been used to treat dependence on a variety of substances. Many substance-abuse programmes use acupuncture as an adjunct to conventional treatment (198). Most of the reports are anecdotal, and while there have been several controlled trials (199–202), the findings have not been consistent. This entire field of research is still at an early stage, holding some promise, but requiring larger-scale and more demanding research studies (198).

Acupuncture treatment has also been used in patients who wish to give up smoking. The conclusions of different researchers are conflicting, however. Some favour acupuncture, while others dismiss its value (203–207). Probably the most convincing results are from randomized controlled trials of passive abstinence, with no suggestion or motivation to stop smoking. The patients were told they would receive acupuncture for other purposes, and they were not asked to stop smoking. A comparison of the effects of auricular acupuncture and body acupuncture was made: 70% of the auricular-acupuncture patients and 11% of those receiving body acupuncture either abstained totally from smoking or reduced the amount of consumption by half. In addition, 72% of the auricular-
acupuncture patients experienced disgust at the taste of tobacco (204). However, in contrast, a meta-analysis of seven reports carefully selected from 16 controlled studies of smoking cessation indicated that acupuncture did not have any greater effect than the placebo (208).

Acupuncture has also been reported to be useful for treating alcohol recidivism. In placebo-controlled trials (with acupuncture at nonspecific points as the control), the patients in the treatment group expressed less need for alcohol than did the control patients. Patients in the treatment group also had fewer drinking episodes and admissions to a detoxification centre (209–211). It is interesting to note that in an experimental study on healthy volunteers, acupuncture diminished clinical alcohol intoxication by increasing the alcohol level in expired air and decreasing blood alcohol levels (212).

2.11 Paediatric disorders

Diarrhoea in infants and young children is still a daunting problem worldwide, particularly in developing countries. Acupuncture seems to be worth using, at least as an adjunct to conventional treatments, because it regulates intestinal function and enhances immune response without causing an imbalance in the intestinal flora as do antibiotics (213, 214).

Convulsions due to high fever are not infrequently encountered in infants and young children. In a controlled clinical trial, convulsions stopped two minutes after needling was started, a result superior to that of intramuscular phenobarbital injection (215).

Although the specific treatment for pertussis is antimicrobials, the paroxysmal coughing is usually very distressing. There has been a report that acupuncture could hasten the cure as well as relieving the cough (87).

There are two controlled studies indicating that acupuncture may be of some help in the treatment of Tourette syndrome in children (216, 217).

2.12 Disorders of the sense organs

Deaf-mute children were once extensively treated with acupuncture in China, but no methodologically sound reports have ever shown that acupuncture therapy had any real effectiveness. A recent randomized controlled clinical trial on sudden-onset deafness in adults favoured acupuncture treatment (218).

Acupuncture might be useful in the treatment of Ménière disease for relieving symptoms and also for reducing the frequency of attacks. It seems to be more effective than conventional drug therapy (beta-histidine, nicotinic acid and vitamin B6) (219).

Tinnitus is often difficult to treat. Traditionally acupuncture has been believed to be effective for treating tinnitus, but only two randomized controlled clinical trials are available— with inconsistent results (220, 221).
Unexplained earache that is neither primary (due to ear disease) nor secondary (as referred pain), is often regarded as a manifestation of psychogenic disturbances. Acupuncture has been shown to be effective in this kind of earache in a placebo-controlled trial (222).

Acupuncture might be helpful in the treatment of simple epistaxis unassociated with generalized or local disease, but only one report of a randomized controlled clinical trial is available. This report indicates that auricular acupuncture provides a more satisfactory effect than conventional haemostatic medication (223).

### 2.13 Skin diseases

In some countries, many skin diseases are customarily treated with acupuncture, but very few controlled studies have been published. In a randomized controlled clinical trial on chloasma, acupuncture had a significantly better effect than vitamins C and E (224).

Some evidence favouring acupuncture treatment of herpes zoster (human (alpha) herpesvirus 3) has been reported. In a randomized controlled trial, laser acupuncture relieved pain and promoted formation of scar tissue much more quickly than treatment with polyinosinic acid (225).

Acupuncture is known to have an antipruritic effect. This has been shown experimentally in volunteers, suggesting that acupuncture could be used in clinical conditions associated with pruritus (226). Acupuncture with dermal needles (seven-star or plum-blossom needles) has traditionally been used in the treatment of neurodermatitis, but confirmation of its effect in a controlled clinical trial was only recently reported (227).

For the treatment of acne vulgaris, acupuncture, particularly ear acupuncture, is worth recommending if the reported therapeutic effects can be further proved (228, 229).

### 2.14 Cancers

No controlled study has been reported on the efficacy of acupuncture in the treatment of cancer itself. However, acupuncture still has uses in cancer treatments. One is to relieve cancer pain, and the other is to control the adverse reactions to radiotherapy and chemotherapy. For cancer pain, it has been reported that acupuncture provided an immediate analgesic effect similar to that of codeine and pethidine, with a more marked effect after use for two months (230). The effect was comparable with that achieved using the analgesic steps recommended by WHO (231). For radiotherapy and chemotherapy, acupuncture can greatly lessen the adverse reactions in the digestive and nervous systems, as well as providing protection against damage to haematopoiesis (232–237).
2.15 Other reports

Obesity and hyperlipaemia are becoming increasingly important medical issues. If acupuncture could help in reducing body weight and blood lipids, its clinical use could be greatly expanded. Quite a number of reports on this effect have been published, but unfortunately, almost none of them is methodologically sound. There are only two preliminary reports of randomized controlled clinical trials that can be cited here (238, 239), although criticism of the study design cannot be totally avoided.

Acupuncture may be of benefit to patients with non-insulin-dependent diabetes mellitus. Its efficacy has been shown to be superior to that of placebos and comparable with that of tolbutamide (240, 241).

Anisodamine is effective in treating excessive salivation induced by drugs (usually antipsychotics), but acupuncture seems to be more effective (242).

There are also reports on the treatment of Sjögren syndrome (sicca syndrome) (243), Raynaud syndrome (244), Stein–Leventhal syndrome (polycystic ovary syndrome) (244), and Tietze syndrome (costochondritis) (245), which indicate beneficial effects from acupuncture treatment. Since these reports have appeared only in individual papers, confirmation by further study is necessary.
The diseases or disorders for which acupuncture therapy has been tested in controlled clinical trials reported in the recent literature can be classified into four categories as shown below.

1. **Diseases, symptoms or conditions for which acupuncture has been proved—through controlled trials—to be an effective treatment:**
   - Adverse reactions to radiotherapy and/or chemotherapy
   - Allergic rhinitis (including hay fever)
   - Biliary colic
   - Depression (including depressive neurosis and depression following stroke)
   - Dysentery, acute bacillary
   - Dysmenorrhoea, primary
   - Epigastralgia, acute (in peptic ulcer, acute and chronic gastritis, and gastropasm)
   - Facial pain (including craniomandibular disorders)
   - Headache
   - Hypertension, essential
   - Hypotension, primary
   - Induction of labour
   - Knee pain
   - Leukopenia
   - Low back pain
   - Malposition of fetus, correction of
   - Morning sickness
   - Nausea and vomiting
   - Neck pain
   - Pain in dentistry (including dental pain and temporomandibular dysfunction)
   - Periarthritis of shoulder
   - Postoperative pain
   - Renal colic
   - Rheumatoid arthritis
2. Diseases, symptoms or conditions for which the therapeutic effect of acupuncture has been shown but for which further proof is needed:

- Abdominal pain (in acute gastroenteritis or due to gastrointestinal spasm)
- Acne vulgaris
- Alcohol dependence and detoxification
- Bell’s palsy
- Bronchial asthma
- Cancer pain
- Cardiac neurosis
- Cholecystitis, chronic, with acute exacerbation
- Cholelithiasis
- Competition stress syndrome
- Craniocerebral injury, closed
- Diabetes mellitus, non-insulin-dependent
- Earache
- Epidemic haemorrhagic fever
- Epistaxis, simple (without generalized or local disease)
- Eye pain due to subconjunctival injection
- Female infertility
- Facial spasm
- Female urethral syndrome
- Fibromyalgia and fasciitis
- Gastrokinetic disturbance
- Gouty arthritis
- Hepatitis B virus carrier status
- Herpes zoster (human (alpha) herpesvirus 3)
- Hyperlipaemia
- Hypo-ovarianism
- Insomnia
- Labour pain
- Lactation, deficiency
- Male sexual dysfunction, non-organic
- Ménière disease
3. Disease and disorders that can be treated with acupuncture

Neuralgia, post-herpetic  
Neurodermatitis  
Obesity  
Opium, cocaine and heroin dependence  
Osteoarthritis  
Pain due to endoscopic examination  
Pain in thromboangiitis obliterans  
Polycystic ovary syndrome (Stein–Leventhal syndrome)  
Postextubation in children  
Postoperative convalescence  
Premenstrual syndrome  
Prostatitis, chronic  
Pruritus  
Radicular and pseudoradicular pain syndrome  
Raynaud syndrome, primary  
Recurrent lower urinary-tract infection  
Reflex sympathetic dystrophy  
Retention of urine, traumatic  
Schizophrenia  
Sialism, drug-induced  
Sjögren syndrome  
Sore throat (including tonsillitis)  
Spine pain, acute  
Stiff neck  
Temporomandibular joint dysfunction  
Tietze syndrome  
Tobacco dependence  
Tourette syndrome  
Ulcerative colitis, chronic  
Urolithiasis  
Vascular dementia  
Whooping cough (pertussis)

3. Diseases, symptoms or conditions for which there are only individual controlled trials reporting some therapeutic effects, but for which acupuncture is worth trying because treatment by conventional and other therapies is difficult:

Chloasma  
Choroidopathy, central serous
Colour blindness
Deafness
Hypophrenia
Irritable colon syndrome
Neuropathic bladder in spinal cord injury
Pulmonary heart disease, chronic
Small airway obstruction

4. Diseases, symptoms or conditions for which acupuncture may be tried provided the practitioner has special modern medical knowledge and adequate monitoring equipment:

   Breathlessness in chronic obstructive pulmonary disease
   Coma
   Convulsions in infants
   Coronary heart disease (angina pectoris)
   Diarrhoea in infants and young children
   Encephalitis, viral, in children, late stage
   Paralysis, progressive bulbar and pseudobulbar
This section provides a tabulated summary of all the controlled clinical trials reviewed for this publication. For each study, information is provided on the author(s), the year of publication, the number of subjects involved, the study design, the type of acupuncture applied, the controls used and the results obtained.
<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
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</thead>
<tbody>
<tr>
<td>Abdominal pain in acute gastroenteritis (see also Gastrointestinal spasm)</td>
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<td>Relief of pain was observed in:</td>
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<tr>
<td>Shu et al., 1997 (67)</td>
<td>25:25</td>
<td>Randomized controlled trial</td>
<td>Body acupuncture (manual)</td>
<td>Routine Western medication (intra-muscular atropine and promethazine)</td>
<td>24 of the test group, starting 1.3 min after acupuncture</td>
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<td>17 of the control group, starting 11.9 min after injection.</td>
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<td>Acne vulgaris</td>
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<td>After 30 days of treatment, a cure was observed in:</td>
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<tr>
<td>Li et al., 1998 (228)</td>
<td>42:42</td>
<td>Randomized controlled trial</td>
<td>Body acupuncture (manual)</td>
<td>Herbal medication</td>
<td>42.8% of the test group</td>
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<td>19.0% of the control group</td>
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<tr>
<td>Wang et al., 1997 (229)</td>
<td>32:20</td>
<td>Group comparison</td>
<td>Auricular acupuncture</td>
<td>Medication (oral vitamin B&lt;sub&gt;6&lt;/sub&gt; and antibiotics, local benzoyl peroxide ointment)</td>
<td>Acne disappeared after 10 days of treatment in:</td>
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<td>19/32 (59%) in the test group</td>
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<td>7/20 (35%) in the control group</td>
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<tr>
<td>Adverse reactions to radiotherapy and/or chemotherapy (see also Leukopenia (this includes leukopenia caused by chemotherapy); Nausea and vomiting)</td>
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<td></td>
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<td></td>
<td>Acupuncture greatly lessened digestive and nervous</td>
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<tr>
<td>Xia et al., 1984 (237)</td>
<td>49:20</td>
<td>Randomized controlled trial</td>
<td>Acupuncture during radiotherapy</td>
<td>Radiotherapy</td>
<td>system reactions (anorexia, nausea, vomiting, dizziness, and fatigue) due to radiotherapy and showed protection against damage to haematopoiesis.</td>
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<td>Gastrointestinal reactions were cured in significantly more of the acupuncture group:</td>
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<td>93.2% of test group after 5.8 ± 2.7 days of treatment</td>
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<td></td>
<td>65.2% of control group after 9.4 ± 3.4 days of treatment.</td>
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<tr>
<td>Chen et al., 1996 (232)</td>
<td>44:23</td>
<td>Randomized controlled trial</td>
<td>Manual plus electric acupuncture</td>
<td>Western medication (metoclopramide, etc.)</td>
<td>Acupoint stimulation therapy was comparable with intravenous metoclopramide for gastrointestinal reactions, and with dexamethasone and cystine phenylacetate (leucogen) for leukopenia. The treatment was effective in:</td>
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<td>87.5% of the test group</td>
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<td>75.0% of the control group</td>
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<tr>
<td>Liu et al., 1998 (235)</td>
<td>40:40</td>
<td>Group comparison</td>
<td>Magnetic plus electric acupoint stimulation</td>
<td>Western medication (metoclopramide, etc.)</td>
<td>The treatment was effective in:</td>
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<td>85.6% of the test group</td>
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<td>61.1% of the control group</td>
</tr>
<tr>
<td>Wang et al., 1997 (236)</td>
<td>90</td>
<td>Randomized crossover study</td>
<td>Body acupuncture (manual)</td>
<td>Western medication (metoclopramide)</td>
<td></td>
</tr>
<tr>
<td>Condition/Study</td>
<td>No.</td>
<td>Design</td>
<td>Test group</td>
<td>Control Group</td>
<td>Results</td>
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</table>
| **Li et al., 1998 (234)**    | 22:20       | Randomized controlled trial     | Body acupuncture (manual)            | Intravenous injection of albumin, milk fat and amino acid | Natural killer cell activity and interleukin-2 were raised in the test group, but markedly lowered in the control group. During the 3-week observation period there was:  
  • no significant change of leukocyte and thrombocyte counts in the test group  
  • considerable lowering of both counts in the control. |
| **Alcohol dependence, see Dependence, alcohol** |             |                                 |                                      |                                                 |                                                                                          |
| **Alcohol detoxification**   |             |                                 |                                      |                                                 |                                                                                          |
| Thorer et al., 1996 (212)    | 35          | Sham controlled trial           | Acupuncture at two different traditional point combinations | Acupuncture at a sham point or no acupuncture | Clinical measurement using tests of equilibrium and orientation, and specific tests of metabolism and elimination of alcohol, formed the basis of the comparison. There was no difference between the sham acupuncture and no acupuncture control groups. After both traditional acupuncture point combinations, clinical effects of alcohol intoxication were minimized, while the alcohol level in the expired air increased and blood alcohol decreased. |
| **Allergic rhinitis (including hay fever)** |             |                                 |                                      |                                                 |                                                                                          |
| Chari et al., 1988 (111)     | 25:20       | Group comparison                | Acupuncture                          | Antihistamine (chlorphenamine)                  | The treatment effects were better and lasted longer in the test group and produced no adverse effects. |
| Jin et al., 1989 (113)       | 100:60      | Randomized controlled trial     | Acupuncture plus moxibustion         | Medication (patent herbal combination: tablets containing Herba Agastachis and Flos Chrysanthemi Indici) | At follow-up 1 month after 15 days of treatment improvement was observed in:  
  • 92/100 in the test group  
  • 47/60 in the control group. |
| Huang, 1990 (112)            | 128:120     | Randomized controlled trial     | Acupuncture plus moxibustion         | Antihistamine (chlorphenamine)                  | Treatment for 14 days was effective in:  
  • 97% of the test group  
  • 75.8% of the control group. |
<p>| Wolkenstein et al., 1993 (247)| 12:12       | Randomized controlled trial     | Acupuncture                          | Sham acupuncture                                | The results did not indicate a protective effect of acupuncture therapy against allergen-provoked rhinitis. |</p>
<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
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</thead>
</table>
| Yu et al., 1994 (115) | 230:30 | Randomized controlled trial | Acupuncture                 | Antihistamine (oral astemizole plus nasal drip 1% ephedrine) | At follow-up 1 year after 4 weeks of treatment, improvement was observed in:  
• 94% of the test group  
• 76.7% of the control group.                                    |
| Liu, 1995 (114)   | 50:30  | Randomized controlled trial | Acupuncture at biqiu (located at the round prominence on the lateral mucous membrane of the lateral nasal cavity) | Nasal drip of cortisone plus ephedrine                      | The treatment was significantly more effective in the test group. Effective rates were:  
• 86.0% in the test group  
• 76.7% in control group.                                    |
| Williamson et al., 1996 (116) | 102 | Randomized controlled trial | Acupuncture                 | Sham acupuncture                                           | The therapeutic effects were similar in the two groups. In the 4-week period following the first treatment, remission of symptoms was seen in:  
• 39% of the test group; mean weekly symptom scores, 18.4; mean units of medication used, 4.1  
• 45.2% of the control group; mean weekly symptom scores, 17.6; mean units of medication used, 5.0. |
| Zhang et al., 1994 (102)  | 22:22  | Randomized controlled trial | Scalp acupuncture           | Conventional supportive measures                           | Assessed by a scoring method, the therapeutic effect was much better in the test group than in the control group. Before treatment, the two groups were comparable in various respects, including causal diseases and area of lesions. |
| You et al., 1993 (106) | 25:25  | Randomized controlled trial | Blood-letting acupuncture   | Medication (vasodilator plus steroid, etc.)                | A cure was achieved in:  
• 96% of the test group  
• 68% of the control group.                                    |
| Lin, 1997 (105)    | 198:60 | Group comparison            | Through acupuncture (puncture of two or more adjoining points with one insertion) | Traditional acupuncture                                     | After a 2-week treatment the cure rate was:  
• 90.9% in the test group  
• 76.7% in the control group.                                    |
4. Summary table of controlled clinical trials

<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biliary colic</strong> (see also Cholecystitis, chronic, with acute exacerbation) Mo, 1987 (62)</td>
<td>70:76</td>
<td>Group comparison</td>
<td>Acupuncture</td>
<td>Medication (injection of atropine plus pethidine)</td>
<td>The analgesic effect was better in the test group than in the control group.</td>
</tr>
</tbody>
</table>
| Yang et al., 1990 (64) | 50:50 | Group comparison | Electric acupuncture | Medication (injection of anisodamine (a Chinese medicine, structurally related to atropine, isolated from Anisodus tangutica) plus pethidine) | Total relief of colic was achieved in 1–3 min in:  
  - 36/50 (72%) in the test group  
  - 12/50 (24%) in the control group.  
  Partial relief was achieved in 5–10 min in:  
  - 10/50 in the test group  
  - 32/50 in the control group. |
| Wu et al., 1992 (63) | 142 | Group comparison | Acupuncture | Anisodamine | The treatment was effective in:  
  - 94.3% of the test group  
  - 80.0% of the control group. |

**Bladder problems**, see Female urethral syndrome; Neuropathic bladder in spinal cord injury

**Breathlessness in chronic obstructive pulmonary disease**

| Jobst et al., 1986 (127) | 12:12 | Randomized controlled trial | Acupuncture | Placebo acupuncture (needling at non-acupuncture "dead" points) | After 3 weeks of treatment, the test group showed greater benefit in terms of subjective scores of breathlessness and 6-min walking distance. Objective measures of lung function were unchanged in both groups. |

**Bronchial asthma**

<p>| Yu et al., 1976 (123) | 20 | Randomized cross-over | Acupuncture | Isoprenaline or sham acupuncture | Isoprenaline was more effective than real acupuncture. Both were more effective than sham acupuncture. |
| Tashkin et al., 1977 (121) (methacholine-induced) | 12 | Randomized cross-over | Acupuncture | Isoprenaline or placebo | Isoprenaline was more effective than acupuncture. Both were more effective than placebo. |
| Fung et al., 1986 (119) (exercise-induced) | 19 | Randomized single-blind crossover | Acupuncture | Sham acupuncture | Real acupuncture provided better protection against exercise-induced asthma than did sham acupuncture. |
| Tandon et al., 1989 (125) (histamine-induced) | 16 | Double-blind cross-over | Acupuncture | Acupuncture at irrelevant points | Treatment with real or placebo acupuncture failed to modulate the bronchial hyperreactivity to histamine, suggesting that a single treatment is unlikely to provide improvement in the management of acute bronchial asthma. |</p>
<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
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<tbody>
<tr>
<td>Acupuncture: review and analysis of controlled clinical trials</td>
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<tr>
<td>He et al., 1994 (120)</td>
<td>48:48</td>
<td>Randomized group comparison</td>
<td>Laser acupuncture</td>
<td>Moxibustion at same points as laser acupuncture</td>
<td>Pulmonary ventilation indices improved in:</td>
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<td>• 33 of the test group</td>
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<td>• 20 of the control group</td>
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<tr>
<td>Xie et al., 1996 (122)</td>
<td>100</td>
<td>Randomized controlled trial with partial crossover</td>
<td>Electric acupuncture at shàoshāng (LU11) (n = 24)</td>
<td>Electric acupuncture at fēishū (BL13) (n = 30)</td>
<td>An anti-asthmatic effect was observed in:</td>
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<td>• 28/30 of the test group (BL13); best immediate effect</td>
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<td>• 20/24 LU11, 22/24 LU10, 24/30 LU9, 24/28 LU8, 21/28 LU7; good effect</td>
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<td>• 4/24 GB40; least effect</td>
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<tr>
<td>Biernacki et al., 1998 (248)</td>
<td>23</td>
<td>Randomized controlled trial, double-blind crossover</td>
<td>Acupuncture</td>
<td>Sham acupuncture</td>
<td>There was no improvement in aspects of respiratory function measured after acupuncture or sham acupuncture. There was significant improvement in the Asthma Quality of Life Questionnaire and a parallel reduction in bronchodilators.</td>
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<tr>
<td>Bulbar paralysis after stroke</td>
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<tr>
<td>Ding, 1996 (249)</td>
<td>120:30</td>
<td>Group comparison with comparable conditions</td>
<td>Acupuncture</td>
<td>Conventional Western medication (troxerutin, piracetam, Cerebrolysin: a brain peptide preparation)</td>
<td>Average recovery time was:</td>
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<td>• 91 (75.8%) in test group after 5.6 days of treatment</td>
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<td>• 12 (40%) in control group after 12 days of treatment</td>
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<td>Cancer pain</td>
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<tr>
<td>Dang et al., 1995 (230)</td>
<td>16:16</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Western medication (codeine, pethidine)</td>
<td>Acupuncture treatment had:</td>
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<td>• immediate analgesic effect similar to Western medication</td>
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<td>• more marked analgesic effect than Western medication after long-term use for 2 months.</td>
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<tr>
<td>Dan et al., 1998 (231)</td>
<td>34:37:42</td>
<td>Group comparison</td>
<td>Body acupuncture or acupuncture plus medication</td>
<td>Medication (analgesic steps recommended by WHO)</td>
<td>An analgesic effect was observed in:</td>
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<td></td>
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<td>• 50.0% of the medication group</td>
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<td></td>
<td>• 73.0% of the acupuncture group</td>
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<tr>
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<td></td>
<td>• 92.2% of acupuncture plus medication group.</td>
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<tr>
<td>Cardiac neurosis</td>
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<tr>
<td>Zhou, 1992 (178)</td>
<td>30:30</td>
<td>Randomized controlled trial</td>
<td>Acupuncture at rénying (ST9)</td>
<td>Medication (propranolol)</td>
<td>At follow-up I month after 10 days of treatment the therapeutic effect was better in the test group than in the control group.</td>
</tr>
</tbody>
</table>
4. Summary table of controlled clinical trials

<table>
<thead>
<tr>
<th>Condition/Study</th>
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<th>Design</th>
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<th>Control Group</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Cardiopulmonary disease</td>
<td>see Breathlessness in chronic obstructive pulmonary disease; Cardiac neurosis; Coronary heart disease (angina pectoris); Pulmonary heart disease, chronic</td>
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<tr>
<td>Cerebrovascular disorders, see Aphasia due to acute cardiovascular disorders; Bulbar paralysis after stroke; Coma; Craniocerebral injury; Stroke</td>
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</tbody>
</table>
| Chloasma | Luan et al., 1996 (224) 60:30 | Randomized controlled trial | Auricular acupuncture plus acupressure | Vitamins C and E | After 3 months of treatment cure was achieved in:  
  - 53.3% of the test group  
  - 13.3% of the control group.  
  The treatment was effective in:  
  - 95.0% of the treatment group  
  - 43.3% of the control group. |
| Cholecystitis, chronic, with acute exacerbation (see also Biliary colic) | Gong et al., 1996 (139) 80:24 | Group comparison | Body plus ear acupuncture | Conventional Western medication (unspecified) | Clinical cure (disappearance of symptoms and signs, and marked improvement of gallbladder motor function as shown by ultrasonic examination) was achieved in:  
  - 92.5% of the test group  
  - 32.1% of the control group. |
| Cholelithiasis | Zhao et al., 1979 (138) 522:74 | Group comparison | Electric acupuncture plus oral magnesium sulfate | Oral magnesium sulfate | Stones were excreted in:  
  - 409/522 (78.4%) in the test group  
  - 20/74 (27.4%) in the control group. |
| Chronic obstructive pulmonary disease, see Breathlessness in chronic obstructive pulmonary disease | | | | | |
| Cocaine dependence, see Dependence, opium, cocaine, heroin | | | | | |
| Colour blindness | Cai, 1998 (250) 44:65: 53 | Group comparison | Body acupuncture or ear acupressure | No treatment | After 1–3 courses of treatment (7–12 days each course), colour discrimination was improved:  
  - from 0.24 to 0.46 in acupuncture group  
  - from 0.27 to 0.52 in ear acupressure group.  
  There was no improvement in the control group (change from 0.28 to 0.30). |
| Coma | Frost, 1976 (108) 17:15 | Group comparison with similar levels of coma | Acupuncture at shéntíng (GV24) and shuígǒu (GV26) | No acupuncture | A neurological recovery of 50% or more (significant difference) was observed in:  
  - 59% of the test group  
  - 20% of the control group. |
| Competition stress syndrome | Que et al., 1986 (196) 111:102 | Randomized controlled trial | Auricular acupressure | Psychotherapy plus placebo drug | The treatment was effective in:  
  - 92.8% of the test group  
  - 7.8% of the control group. |
<table>
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<tr>
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<th>Control Group</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Convulsions in infants and young children due to high fever</td>
<td></td>
<td>Randomized controlled trial</td>
<td>Acupuncture at hégū (LI4)</td>
<td>Intramuscular phenobarbital</td>
<td>Convulsions stopped 2 min after starting treatment in:</td>
</tr>
<tr>
<td>He et al., 1997 ([215])</td>
<td>51:51</td>
<td></td>
<td></td>
<td></td>
<td>• 98% of the test group</td>
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<td>• 51% of the control group</td>
</tr>
<tr>
<td>Coronary heart disease (angina pectoris)</td>
<td></td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Sham acupuncture (insertion of needles outside the meridians)</td>
<td>Cardiac work capacity (difference in pressure-rate product (dPRP)) between rest &amp; maximum exercise &amp; maximum PRP during exercise, was measured. No adverse effect was observed. Patients receiving active acupuncture showed significant increase in cardiac work capacity compared to those receiving sham acupuncture.</td>
</tr>
<tr>
<td>Ballegaard et al., 1986 ([180])</td>
<td>13:13</td>
<td></td>
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<td></td>
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<tr>
<td>Ballegaard et al., 1990 ([181])</td>
<td>24:25</td>
<td></td>
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<td></td>
<td>There was a median reduction of 50% in anginal attack rate and glyceryl trinitrate consumption in both groups, with no significant difference between the groups. The increase in exercise tolerance and delay of onset of pain was significant in the test group; there were no significant changes in the control group.</td>
</tr>
<tr>
<td>Xue et al., 1992 ([186])</td>
<td>42:27</td>
<td></td>
<td></td>
<td>Medication (nifedipine plus isosorbide dinitrate)</td>
<td>Acupuncture was more effective in improving symptoms and ECG and pulse doppler ultrasonocardiography indices.</td>
</tr>
<tr>
<td>Mao et al., 1993 ([184])</td>
<td>30:30</td>
<td></td>
<td></td>
<td>Conventional medication (glyceryl trinitrate, aspirin, calcium antagonist)</td>
<td>Improvement in symptoms and ECG, respectively, were observed in:</td>
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<tr>
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<td></td>
<td>• 85.7% and 69% of the test group</td>
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<td></td>
<td>• 57.1% and 38% of the control group</td>
</tr>
<tr>
<td>Dai et al., 1995 ([182])</td>
<td>20:18</td>
<td></td>
<td>Auricular acupuncture at point heart</td>
<td>Auricular acupuncture at point stomach</td>
<td>Marked relief of angina pectoris and other symptoms, with improvement of ECG &amp; haemorhoeological indices was observed in the test group. There was no such effect in the control group.</td>
</tr>
<tr>
<td>Cheng, 1995 ([183])</td>
<td>50:50</td>
<td></td>
<td>Auricular acupressure</td>
<td>Conventional medication (glyceryl trinitrate, etc.)</td>
<td>A marked effect (no recurrence of angina during the 4–5 weeks of treatment) was observed in:</td>
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<td>• 74% of the test group</td>
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<td></td>
<td>• 52% of the control group</td>
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</tbody>
</table>
### 4. Summary table of controlled clinical trials

<table>
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<tr>
<th>Condition/Study</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Ma et al., 1997 (251)</strong></td>
<td>30:24</td>
<td>Randomized controlled trial</td>
<td>Body acupuncture plus routine Western medication (aspirin, nitrates and calcium antagonist)</td>
<td>Routine Western medication (aspirin, nitrates and calcium antagonist)</td>
<td>After 10 days of hospitalization and treatment, improvement in angina pectoris and ST-T, respectively, was observed in: • 85.7% and 69% of the test group • 58.3% and 33.3% of the control group. Levels of serotonin, noradrenaline and dopamine were higher than normal in both groups but were significantly lowered only in test group after the treatment.</td>
</tr>
<tr>
<td><strong>Craniocerebral injury, closed</strong></td>
<td>50:50</td>
<td>Group comparison</td>
<td>Body acupuncture</td>
<td>Routine Western medication (unspecified)</td>
<td>After 15 days of treatment, clinical cure (disappearance of the main clinical symptoms and signs, and basic recovery of functions) was observed in: • 86% of the test group • 56% of the control group.</td>
</tr>
<tr>
<td><strong>Deafness, sudden onset</strong></td>
<td>50:50</td>
<td>Randomized controlled trial</td>
<td>Body acupuncture plus routine Western treatment (dextran, dexamethasone, etc.)</td>
<td>Routine Western medication (dextran, dexamethasone, etc.)</td>
<td>After 2 weeks of treatment, the effect was highly statistically significant in: • 90% of the test group • 70% of the control group.</td>
</tr>
<tr>
<td><strong>Defective ejaculation, see Male sexual dysfunction, non-organic</strong></td>
<td>30:30:40</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Herbal medication or the Goboes and Liu regimens (treatment included sex instruction, electric massage, hormonal therapy and injection of strychnine and galantamine)</td>
<td>After 1 month of treatment, the cure rate was: • 83.3% in the test group • 56.7% in the herbal medication group • 12.5% in the control Goboes and Liu regimen group.</td>
</tr>
<tr>
<td><strong>Dental pain</strong></td>
<td>40</td>
<td>Randomized controlled trial</td>
<td>Acupuncture plus placebo drug</td>
<td>Sham acupuncture plus placebo drug, sham acupuncture plus codeine, or acupuncture plus codeine</td>
<td>Acupuncture plus placebo drug gave significantly greater pain relief than sham acupuncture plus placebo drug or sham acupuncture plus codeine. Acupuncture plus placebo drug was more effective than acupuncture plus codeine in initial 30 min after surgery; less effective 2–3 h after surgery.</td>
</tr>
<tr>
<td><strong>Zheng et al., 1990 (79)</strong></td>
<td>15:11</td>
<td>Randomized controlled trial</td>
<td>Auricular acupressure</td>
<td>No treatment</td>
<td>After 48 h, there was no pain in: • 12/15 (80%) in the test group • 4/11 (36%) in the control group.</td>
</tr>
<tr>
<td>Condition/Study</td>
<td>No.</td>
<td>Design</td>
<td>Test group</td>
<td>Control Group</td>
<td>Results</td>
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<tr>
<td>Lao et al., 1995 (77) (after tooth extraction)</td>
<td>11:8</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Placebo acupuncture</td>
<td>Subjects treated with acupuncture reported a significantly longer period without pain and experienced less intense pain than controls.</td>
</tr>
</tbody>
</table>
| Sukandar et al., 1995 (80) (apical periodontitis) | 20:20     | Randomized controlled trial | Electric acupuncture            | Mock electric acupuncture       | Analgesic effect lasting 24 h was obtained in:  
  - 65% of the test group  
  - 10% of the control group.                                                                                                                                                                                                                                                                                                 |
| Lao et al., 1999 (73) (after oral surgery) | 19:20     | Randomized controlled trial | Acupuncture                     | Placebo acupuncture             | Acupuncture was statistically significantly superior to the placebo in preventing postoperative dental pain. Mean pain-free postoperative time and minutes before requesting pain relief medication, respectively, were:  
  - 172.9 min and 242.1 min in the test group  
  - 93.8 min and 166.2 min in the placebo group.                                                                                                                                                                                                 |
| Dependence, alcohol                    |           |                            |                                 |                                 | There was a significant difference between the two groups at the end of the study; patients in the test group expressed less need for alcohol, with fewer drinking episodes.                                                                                                                                                                                                 |
| Bullock et al., 1987 (210)             | 27:27     | Randomized controlled trial | Acupuncture at specific points   | Acupuncture at non-specific points | Significant treatment effects persisted at the end of the 6-month follow-up; more control patients expressed a moderate–strong need for alcohol and had more than twice the number of drinking episodes & admissions to detoxification centres.                                                                                                                   |
| Bullock et al., 1989 (211)             | 40:40     | Randomized controlled trial | Acupuncture at specific points   | Acupuncture at non-specific points |                                                                                                                                                                                                                                                                                                                                        |
| Dependence, opium, cocaine and heroin  |           |                            |                                 |                                 | Abstinence rates during final 2 weeks of 8-week treatment were:  
  - auricular acupuncture 44%  
  - desipramine 26%  
  - amantadine 15%  
  - drug placebo 13%.                                                                                                                                                                                                                                                                                                         |
<p>| Margolin et al., 1993 (201) (cocaine)  | 32 per group | Group comparison (post hoc) | Auricular                       | Desipramine, amantadine or drug placebo | Self-reported frequency of heroin use was lower in the test group.                                                                                                                                                                                                                                                                  |
| Washburn et al., 1993 (202) (heroin)   | 100       | Randomized controlled trial | Acupuncture                     | Sham acupuncture                | Reduction of anorexia, spontaneous sweating and insomnia in the late stage of abstinence was greater in test group, and statistically significant.                                                                                                                                                                                      |
| Cai et al., 1998 (200) (heroin, late stage of abstinence) | 60:60     | Randomized controlled trial | Body acupuncture                | Vitamin B1                      |                                                                                                                                                                                                                                                                                                                                        |</p>
<table>
<thead>
<tr>
<th>Condition/Study</th>
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<th>Control Group</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Bullock et al., 1999 (cocaine)</td>
<td>236</td>
<td>Randomized controlled trial</td>
<td>Auricular acupuncture</td>
<td>Acupuncture at sham ear points or conventional treatment without acupuncture</td>
<td>The data failed to identify significant treatment differences among the various groups.</td>
</tr>
<tr>
<td>Dependence, tobacco</td>
<td>Fang, 1983 (204)</td>
<td>33:28</td>
<td>Randomized controlled trial (patients told they were receiving acupuncture for other purposes)</td>
<td>Auricular acupuncture</td>
<td>Body acupuncture</td>
</tr>
<tr>
<td>Clavel et al., 1985 (253)</td>
<td>224:205:222</td>
<td>Randomized group comparison</td>
<td>Acupuncture</td>
<td>Nicotine gum or minimal intervention (cigarette case with lock controlled by a time switch, which could be regulated at will)</td>
<td>Acupuncture and nicotine gum did not reduce the tendency to relapse after one month but were effective in helping smokers to stop smoking during the first month in: • 43/224 in the acupuncture group • 46/205 in the group receiving nicotine gum • 8/222 in the minimal intervention group.</td>
</tr>
<tr>
<td>He et al., 1997 (205)</td>
<td>23:23</td>
<td>Randomized controlled trial</td>
<td>Acupuncture at points used to assist smoking cessation</td>
<td>Acupuncture at points assumed to have no effect on smoking cessation</td>
<td>Daily cigarette consumption fell during the treatment in both groups, but the reduction was larger in the test group. Serum concentrations of cotinine and thiocyanate were significantly reduced after the treatment period in the test group but not in the control group.</td>
</tr>
<tr>
<td>White et al., 1998 (207)</td>
<td>76</td>
<td>Randomized controlled trial</td>
<td>Electric acupuncture at appropriate points in each ear</td>
<td>Sham procedure (auricular acupuncture over the mastoid bone)</td>
<td>There was no significant difference between the two groups in the mean score for reduction of withdrawal symptoms.</td>
</tr>
<tr>
<td>Waite et al., 1998 (206)</td>
<td>78</td>
<td>Randomized controlled trial</td>
<td>Electric acupuncture plus self-retained ear seed (a herbal seed used to apply pressure to the point) at an active site</td>
<td>Auricular acupuncture plus self-retained ear seed at a placebo site</td>
<td>The test acupuncture was significantly more effective in helping volunteers to quit smoking than the control treatment. Cessation of smoking at 6 months in: • 12.5% of the test group • 0% of the control group.</td>
</tr>
<tr>
<td>Depression (see also Depression after stroke)</td>
<td>Luo et al., 1985 (191)</td>
<td>27:20</td>
<td>Randomized controlled trial</td>
<td>Electric acupuncture</td>
<td>Medication (amitriptyline)</td>
</tr>
<tr>
<td>Condition/Study</td>
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<td>Test group</td>
<td>Control Group</td>
<td>Results</td>
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<tr>
<td>Luo et al., 1988 (192)</td>
<td>133:108</td>
<td>Multicentre, randomized controlled trial</td>
<td>Electric acupuncture</td>
<td>Medication (amitriptyline)</td>
<td>There was a similar improvement in the two groups but a greater effect on anxiety and fewer side-effects in the test group.</td>
</tr>
<tr>
<td>Yang et al., 1994 (193)</td>
<td>20:20</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Medication (amitriptyline)</td>
<td>There was a similar improvement in the two groups after 6 weeks.</td>
</tr>
<tr>
<td>Luo et al., 1998 (254)</td>
<td>29</td>
<td>Randomized controlled trial</td>
<td>Electric acupuncture plus placebo</td>
<td>Electric acupuncture plus amitriptyline</td>
<td>The therapeutic efficacy was similar in the two groups for depressive disorders. The therapeutic effect for anxiety somatization and cognitive process disturbance was greater and there were fewer side-effects in the test group.</td>
</tr>
<tr>
<td>Depression after stroke</td>
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</tr>
<tr>
<td>Li et al., 1994 (190)</td>
<td>34:34:33</td>
<td>Randomized controlled trial</td>
<td>“Antidepressive” acupuncture (different selection of points)</td>
<td>Medication (doxepin) plus traditional acupuncture or traditional acupuncture alone</td>
<td>There was a similar improvement in the antidepressive acupuncture and medication plus traditional acupuncture groups; improvement was superior to that in traditional acupuncture group.</td>
</tr>
<tr>
<td>Hou et al., 1996 (189)</td>
<td>30:30</td>
<td>Randomized controlled trial with independent assessment</td>
<td>Electric acupuncture at bāihuì (GV20) and yǐntāng (EX-HN3)</td>
<td>Traditional manual acupuncture</td>
<td>The results were better in the test group; the difference was significant as assessed by the Hamilton and other scoring methods.</td>
</tr>
<tr>
<td>Depressive neurosis</td>
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<tr>
<td>Zhang, 1996 (194)</td>
<td>31 per group</td>
<td>Randomized controlled trial</td>
<td>Laser acupuncture</td>
<td>Conventional antidepressant (doxepin, amitriptyline or aprazolam)</td>
<td>The therapeutic effect was similar in the two groups, somewhat better in the test group for cognitive disturbance. Side-effects occurred in all cases in control group but in none in test group.</td>
</tr>
<tr>
<td>Diabetes mellitus, non-insulin-dependent</td>
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</tbody>
</table>
| Latief, 1987 (241)     | 20:20   | Randomized controlled trial                 | Acupuncture at sānyǐniājiāo (SP6)             | Acupuncture at 1 Chinese inch (cun) superiolateral to SP6 | There was a reduction in fasting blood sugar of:  
  • 19.2% in the test group  
  • 4.9% in the control group.                                                                 |
| Kang et al., 1995 (240) | 12:15:13:10 | Randomized controlled trial                 | Untimed acupuncture or acupuncture at insulin secretion climax (ISCA) or acupuncture at insulin secretion valley (ICSV) | Conventional Western medication (tolbutamide) | Improvement in fasting blood glucose, 2-h glucose, postprandial blood glucose, 24-h urine glucose, and glucosylated haemoglobin was:  
  • marked in the ISCA group  
  • superior in the ISCA group to that in the untimed acupuncture and ISVA groups  
  • similar in the ISCA group to that of the tolbutamide group. |
<table>
<thead>
<tr>
<th>Condition/Study</th>
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<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diarrhoea, see Diarrhoea in infants and children; Dysentery, acute bacillary; Irritable colon syndrome</strong></td>
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<tr>
<td>Diarrhoea in infants and young children</td>
<td>Li et al., 1997 (213)</td>
<td>380:450</td>
<td>Group comparison</td>
<td>Acupuncture at zúsānli (ST36) and chángqiáng (GV1)</td>
<td>Medication (gentamicin or haloperidol)</td>
</tr>
<tr>
<td></td>
<td>Yang, 1998 (214)</td>
<td>100:70</td>
<td>Group comparison</td>
<td>Body acupuncture and moxibustion</td>
<td>Medication (antibiotics and vitamins)</td>
</tr>
<tr>
<td><strong>Dysentery, acute bacillary</strong></td>
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<tr>
<td>Qiu et al., 1986 (9)</td>
<td>596:281</td>
<td>Group comparison</td>
<td>Acupuncture</td>
<td>Medication (furazolidone)</td>
<td>Acupuncture relieved symptoms earlier than furazolidone. Stool culture became negative in: • 92.4% of the test group • 98.2% of the control group.</td>
</tr>
<tr>
<td>Li, 1990 (8)</td>
<td>276:269</td>
<td>Group comparison</td>
<td>Acupuncture</td>
<td>Medication (sytomycin, furazolidone)</td>
<td>Stool culture became negative in all patients after 7 days, but within 7 days in: • 87.7% of the test group; recurrence rate in 1 year, 2.4% • 74.2% of the control group; recurrence rate in 1 year, 2.5%.</td>
</tr>
<tr>
<td>Yu et al., 1992 (10)</td>
<td>162:164</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Medication (furazolidone)</td>
<td>Both treatments relieved symptoms and signs, with no side-effects. Stool culture became negative in: • 128 (79%) in the test group by 5.1 days; recurrence at 9-month follow-up in 4 cases • 143 (87.2%) in the control group by 3.2 days; recurrence at 9-month follow-up in 5 cases.</td>
</tr>
<tr>
<td><strong>Dysmenorrhoea, primary</strong></td>
<td></td>
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</tr>
<tr>
<td>Helms, 1987 (153)</td>
<td>11:11:11:10</td>
<td>Randomized controlled trial, comparing four groups</td>
<td>Acupuncture</td>
<td>Placebo acupuncture, no acupuncture but conventional treatment, no acupuncture but conventional treatment and control visits to physician</td>
<td>Improvement was observed in: • 10/11(90.9%) in the real acupuncture group • 4/11 (36.4%) in the placebo acupuncture group • 2/11 (18.2%) in the conventional treatment control group • 1/10 (10%) in the conventional treatment plus visits control group.</td>
</tr>
<tr>
<td>Condition/Study</td>
<td>No.</td>
<td>Design</td>
<td>Test group</td>
<td>Control Group</td>
<td>Results</td>
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<tr>
<td><strong>Acupuncture: review and analysis of controlled clinical trials</strong></td>
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<tr>
<td>Shi et al., 1994 (154)</td>
<td>120:44</td>
<td>Randomized controlled trial</td>
<td>Acupuncture at sāryinjīāo (SP6)</td>
<td>Medication (a paracetamol–propyphenazon–caffeine combination)</td>
<td>A better and quicker analgesic effect was observed in the test group.</td>
</tr>
<tr>
<td><strong>Dysphagia in pseudobulbar paralysis</strong></td>
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<tr>
<td>Liu et al., 1998 (255)</td>
<td>30:30</td>
<td>Randomized controlled trial</td>
<td>Body acupuncture</td>
<td>Logemann functional training of lingual muscles</td>
<td>Cure rates after 15 days were:</td>
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<td>•  26 in the test group (average 8.7 days)</td>
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<td>•  6 in the control group.</td>
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<tr>
<td><strong>Earache, unexplained</strong></td>
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<tr>
<td>Mekhamer A et al. 1987 (222)</td>
<td>96</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Mock TENS</td>
<td>The response was significantly better following acupuncture than placebo for both 33% and 50% pain-relief criteria.</td>
</tr>
<tr>
<td><strong>Encephalitis, see Viral encephalitis in children</strong></td>
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<tr>
<td><strong>Epidemic haemorrhagic fever</strong></td>
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<tr>
<td>Song et al., 1992 (86)</td>
<td>38:32</td>
<td>Randomized controlled trial</td>
<td>Moxibustion</td>
<td>Western medication. (steroid, supportive treatment)</td>
<td>Moxibustion shortened the period of oliguria and accelerated the fall in urine protein and reduction in kidney swelling (ultrasound).</td>
</tr>
<tr>
<td><strong>Epigastralgia, acute (in peptic ulcer, acute and chronic gastritis, and gastrospasm)</strong></td>
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<tr>
<td>Xu et al., 1991 (128)</td>
<td>42:31</td>
<td>Randomized controlled trial</td>
<td>Acupuncture at liāngqū (ST34) and wēishū (BL21)</td>
<td>Conventional medication. (anisodamine)</td>
<td>The treatment was effective in:</td>
</tr>
<tr>
<td>Yu, 1997 (129)</td>
<td>160:40</td>
<td>Randomized controlled trial</td>
<td>Acupuncture (manual) at zūsānlī (ST36)</td>
<td>Medication (morphine plus atropine)</td>
<td>•  97.6% of the test group</td>
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<td>•  83.9% of the control group.</td>
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<tr>
<td><strong>Epistaxis, simple (without generalized or local disease)</strong></td>
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<tr>
<td>Lang et al., 1995 (223)</td>
<td>92:42</td>
<td>Randomized controlled trial</td>
<td>Auricular acupuncture with thumb-tack needle</td>
<td>Western medication (carbazochrome salicylate plus vitamin C)</td>
<td>Cure (no recurrence at 3-month follow-up) was observed in:</td>
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<td>•  84.8% of the test group</td>
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<td>•  28.6% of the control group.</td>
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<tr>
<td><strong>Eye pain due to subconjunctival injection</strong></td>
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<tr>
<td>Shen, 1996 (14)</td>
<td>24:15</td>
<td>Randomized controlled trial</td>
<td>Acupuncture at bīnāo (LI14)</td>
<td>No treatment</td>
<td>Pain mostly disappeared in 0.5–1 min in 22/24 of the test group but persisted for 30–60 min in all of the control patients.</td>
</tr>
<tr>
<td><strong>Facial pain (including craniomandibular disorders) (see also Temporomandibular joint dysfunction)</strong></td>
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<tr>
<td>Hansen et al., 1983 (29)</td>
<td>16</td>
<td>Randomized crossover trial</td>
<td>Acupuncture</td>
<td>Sham acupuncture</td>
<td>Pain levels were more significantly reduced following acupuncture than following sham acupuncture.</td>
</tr>
</tbody>
</table>
### Condition/Study

<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johansson et al., 1991</td>
<td>15 per group</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Occlusal splint or no treatment</td>
<td>Acupuncture was as effective as occlusal splint. At follow-up, subjective dysfunction scores and visual analogue scale assessments were significantly lower in the test group.</td>
</tr>
<tr>
<td>List, 1992 (31)</td>
<td>110</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Occlusal splint or no treatment</td>
<td>Symptoms were reduced by acupuncture and occlusal-splint therapy. The control group remained essentially unchanged. Acupuncture gave better short-term subjective results than occlusal splint.</td>
</tr>
</tbody>
</table>
| Cai, 1996 (28)           | 32:36   | Randomized controlled trial | Acupuncture with retention of needles for 1–1.5 h | Acupuncture with retention of needles for 0.5 h | Marked effect (with effective rate after course of treatment of 14 sessions):  
  - 59.3% of test group after 5 sessions of treatment; overall effective rate, 93.7%  
  - 25% of the control group after 11 sessions on average; overall effective rate, 77.8%. |
| Facial spasm             |         |                            |                                                 |                                                 |                                                                         |
| Liu, 1996 (107)          | 33:33   | Randomized controlled trial | Wrist–ankle acupuncture                         | Body acupuncture                                | Elimination of involuntary twitching with no recurrence at 6-month follow-up in:  
  - 69.7% of the test group  
  - 39.4% of the control group. |
| Female urethral syndrome |         |                            |                                                 |                                                 |                                                                         |
| Zheng et al., 1997       | 103:50  | Randomized controlled trial | Body acupuncture and moxibustion.               | Medication (Urgenin: herbal extract containing Serenoa serrulata, effective for irritable bladder; used because antibiotics had proved ineffective in all patients) | Effective rates after 1–2 months of treatment were:  
  - 88.3% in the test group  
  - 28% in the control group. |
| Wang et al., 1998        | 56:37   | Randomized controlled trial | Body acupuncture and moxibustion.               | Medication. (Urgenin; used because antibiotics had proved ineffective) | Effective rates after 1–2 months of treatment were:  
  - 87.5% in the test group (urodynamic study also showed the beneficial effect of acupuncture)  
  - 29.7% in the control group. |
<table>
<thead>
<tr>
<th>Condition/Study</th>
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<th>Design</th>
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<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever, see Convulsions in infants and young children due to high fever; Tonsillitis, acute</td>
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<tr>
<td>Fibromyalgia</td>
<td>Deluze et al., 1992 (40) 36:34</td>
<td>Randomized controlled trial with independent assessment</td>
<td>Acupuncture</td>
<td>Sham acupuncture</td>
<td>There was a significant difference between the two groups with improvement in:</td>
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<td></td>
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<td></td>
<td>• 7 of the 8 parameters in the test group</td>
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<td>• none of the parameters in the control group</td>
</tr>
<tr>
<td>Gastrointestinal spasm</td>
<td>Shi et al., 1995 (130) 100:100</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Atropine</td>
<td>Total relief of pain in 30 min was observed in:</td>
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<td>• 98 in the test group</td>
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<td>• 71 in the control group</td>
</tr>
<tr>
<td>Gastrokinetic disturbance</td>
<td>Zhang et al., 1996 (131) 104:41</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Conventional medication (domperidone)</td>
<td>Effective rates (no significant difference between the two groups) were:</td>
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<td>• 95.2% in the test group</td>
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<td></td>
<td>• 90.2% in the control group</td>
</tr>
<tr>
<td>Gouty arthritis</td>
<td>Li et al., 1993 (60) 23:19</td>
<td>Randomized controlled trial</td>
<td>Blood-pricking acupuncture</td>
<td>Conventional medication (allopurinol)</td>
<td>The test group showed more marked improvement than the control group. Reduction in blood and urine uric acid was similar in the two groups.</td>
</tr>
<tr>
<td></td>
<td>Pan, 1997 (61) 39:20</td>
<td>Randomized controlled trial</td>
<td>Plum-blossom needling plus cupping</td>
<td>Medication (allopurinol)</td>
<td>After 6 weeks of treatment, marked improvement was observed in:</td>
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<td>• 100% of the test group</td>
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<td>• 65% of the control group</td>
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<tr>
<td>Haemorrhagic fever, see Epidemic haemorrhagic fever</td>
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<tr>
<td>Hay fever, see Allergic rhinitis (including hay fever)</td>
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<tr>
<td>Headache</td>
<td>Ahonen et al., 1983 (17) myogenic 12:10</td>
<td>Group comparison</td>
<td>Acupuncture</td>
<td>Physiotherapy</td>
<td>Significant changes in pain and electromyogram in both groups, with 4 sessions of acupuncture equivalent to 8 sessions of physiotherapy.</td>
</tr>
<tr>
<td></td>
<td>Loh et al., 1984 (23) migraine and tension 48</td>
<td>Crossover (incomplete)</td>
<td>Acupuncture</td>
<td>Standard drug therapy (mainly propranolol)</td>
<td>Benefit was observed in:</td>
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<tr>
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<td>• 59% of the test group; 39% with marked improvement</td>
</tr>
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<td>• 25% of the control group; 11% with marked improvement.</td>
</tr>
<tr>
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<td>Control Group</td>
<td>Results</td>
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<tr>
<td>Dowson et al., 1985 (migraine)</td>
<td>25:23</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Mock TENS</td>
<td>33% severity improvement was observed in: • 56% (14/25) of the acupuncture group • 30% (7/23) of the control group. Headache frequency was reduced in: • 44% (11/25) of the acupuncture group • 57% (13/23) of the control group.</td>
</tr>
<tr>
<td>Doerr-Proseke et al., 1985 (migraine)</td>
<td>10 per group</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Psychological biobehavioural treatment or no treatment (on waiting list)</td>
<td>Over 3 months of treatment, there was a significant reduction of headache frequency and intensity in the acupuncture and psychological biobehavioural groups. There was almost no change in those on the waiting list.</td>
</tr>
<tr>
<td>Vincent, 1989 (migraine)</td>
<td>15:15</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Sham acupuncture</td>
<td>There was a significant difference between two groups: the test group experienced sustained improvement over 1 year after only 6 treatments in a 6-week period.</td>
</tr>
<tr>
<td>Tavola et al., 1992 (tension)</td>
<td>15:15</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Sham acupuncture</td>
<td>The mean decreases in headache episodes, headache index and analgesic intake, respectively were: • 44.3%, 58.3% and 57.7% in the test group • 21.4%, 27.8% and 21.7% in the control group.</td>
</tr>
<tr>
<td>Kubiena et al., 1992 (migraine)</td>
<td>15:15</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Placebo acupuncture</td>
<td>The test group showed better results than the control group (reduction in frequency of attacks, intensity of pain and amount of medication taken).</td>
</tr>
<tr>
<td>Xu et al., 1993 (migraine)</td>
<td>50:50</td>
<td>Randomized group comparison</td>
<td>Manual acupuncture</td>
<td>Electric acupuncture</td>
<td>There was an immediate analgesic effect in: • 80% of the test group • 48% of the control group.</td>
</tr>
<tr>
<td>Weinschütz et al., 1994 (migraine)</td>
<td>20:20</td>
<td>Controlled trial, comparable pretreatment conditions</td>
<td>Acupuncture at classical points</td>
<td>Acupuncture at points 1–2 cm from those used in test group</td>
<td>Acupuncture at classical points yielded a significant therapeutic effect superior to the control acupuncture.</td>
</tr>
<tr>
<td>Chen et al., 1997 (migraine)</td>
<td>45:30</td>
<td>Group comparison</td>
<td>Penetrating acupuncture</td>
<td>Nimodipine</td>
<td>After 20 days of treatment, headache disappeared with no recurrence after 6 months of follow-up in: • 30/45 in the test group • 16/30 in the control group.</td>
</tr>
<tr>
<td>Condition/Study</td>
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<td>Control Group</td>
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<tr>
<td>Liu et al., 1997 (22) (migraine)</td>
<td>30:34</td>
<td>Randomized controlled trial</td>
<td>Scalp acupuncture</td>
<td>Flunarizine</td>
<td>Headache was relieved after 1 week treatment in: &lt;ul&gt;• 73.3% of the test group&lt;br&gt;• 38.2% of the control group. &lt;/ul&gt;</td>
</tr>
<tr>
<td>Heart disease, see Coronary heart disease (angina pectoris); Pulmonary heart disease, chronic</td>
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<tr>
<td>Wang et al., 1991 (85) Hepatitis B virus carrier</td>
<td>70:42</td>
<td>Group comparison</td>
<td>Acupuncture plus moxibustion</td>
<td>Herbal medication (Herba Cymbopogonis)</td>
<td>After 3 months of treatment, carrier status became negative in: &lt;ul&gt;• 30% of the test group&lt;br&gt;• 2.4% of the control group.&lt;br&gt;Antibodies to hepatitis B e core antigen were produced in: &lt;ul&gt;• 50% of the test group&lt;br&gt;• 6.25% of the control group. &lt;/ul&gt;</td>
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<td>Heroin dependence, see Dependence, opium, cocaine, heroin</td>
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<tr>
<td>Chen et al., 1994 (225) Herpes zoster (human (alpha) herpesvirus 3) (see also Neuralgia, post-herpetic)</td>
<td>33:32</td>
<td>Randomized controlled trial</td>
<td>Laser acupuncture</td>
<td>Polyninosinic acid</td>
<td>Disappearance of pain and formation of scabs, respectively, occurred after: &lt;ul&gt;• 1.48 and 5.76 days of laser acupuncture&lt;br&gt;• 10.5 and 10.4 days of medication. &lt;/ul&gt;</td>
</tr>
<tr>
<td>Wang, 1998 (239) Hyperlipaemia</td>
<td>40:25</td>
<td>Group comparison</td>
<td>Acupuncture injection plus oral administration of simvastatin</td>
<td>Oral administration of simvastatin</td>
<td>Significant improvement after 30 days of treatment in: &lt;ul&gt;• 36/40 (90%) in the test group&lt;br&gt;• 11/25 (44%) in the control group. &lt;/ul&gt;</td>
</tr>
<tr>
<td>Iurenev et al., 1988 (173) Hypertension, essential</td>
<td>25:38</td>
<td>Group comparison</td>
<td>Acupuncture</td>
<td>Conventional medication (rescinnamine)</td>
<td>The therapeutic efficacy was similar in the two groups.</td>
</tr>
<tr>
<td>Zhou et al., 1990 (176)</td>
<td>135:68: 71</td>
<td>Group comparison</td>
<td>Auricular acupressure</td>
<td>Medication (nifedipine plus propranolol) or placebo drug</td>
<td>There was a similar improvement with acupressure and medication. Both were superior to placebo.</td>
</tr>
<tr>
<td>Yu et al., 1991 (175)</td>
<td>280:51</td>
<td>Group comparison</td>
<td>Auricular acupressure</td>
<td>Conventional medication (reserpine)</td>
<td>There was a similar improvement in the two groups. There were no side-effects in the test group.</td>
</tr>
<tr>
<td>Condition/Study</td>
<td>No.</td>
<td>Design</td>
<td>Test group</td>
<td>Control Group</td>
<td>Results</td>
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</table>
| Wu et al., 1997 (174) | 82:118 | Group comparison         | Scalp acupuncture                             | Conventional medication (nifedipine)         | The effects were similar, with no statistically significant difference, in the two groups:  
  - marked response in 47.6%, partial response in 50% of the test group  
  - marked response in 57.6%, partial response in 40.7% of the control group. |
| Dan, 1998 (172)       | 26:26 | Randomized controlled trial | Acupuncture                                   | Conventional medication (nifedipine)         | Monitoring of ambulatory blood pressure showed a similar reduction in 24-h systolic and diastolic blood pressure in the two groups. The reduction in myocardial oxygen consumption index was greater in the test group. |
| Hypo-ovarianism       |      |                         |                                               |                                             | Marked improvement was observed in:  
  - 43/56 (76.8%) in the test group (hormonal assay showed a further long-term effect after treatment)  
  - 26/55 (47.3%) in the diethylstilbestrol group. |
| Ma et al., 1997 (256) | 30:30 | Randomized controlled trial | Body acupuncture (manual) plus cupping         | Medication (diethylstilbestrol)              | Intelligence quotient increased:  
  - from 53.97 to 65.07 (11.10 ± 2.96) in the test group  
  - from 53.87 to 55.12 in the control group. Social adaptability behaviour increased:  
  - from 7.51 to 8.89 (1.38 ± 0.31) in test group  
  - from 7.57 to 7.82 in the control group. |
| Hypophrenia           |      |                         |                                               |                                             | After 10 days of treatment, blood pressure was restored to normal in:  
  - 45 in the study group (no improvement in 1)  
  - 15 in the control group (no improvement in 25). |
| Guo, 1992 (170)       | 50:50 | Randomized controlled trial | Auricular acupressure                         | Herbal tonics                               | A therapeutic effect was observed after 0.5–1 month of treatment in:  
  - 172/180 (95.5%) in the test group  
  - 46/60 (76.7%) in the control group. |
<table>
<thead>
<tr>
<th>Condition/Study</th>
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<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Induction of labour</td>
<td>Yu et al., 1981 (161)</td>
<td>10:10:8 Randomized group comparison</td>
<td>Acupuncture at distant points or local points</td>
<td>Acupuncture at distant plus local points</td>
<td>Acupuncture at distant points was superior to that at local points in strengthening uterine contractions for induction of labour. Combined use of distant &amp; local points was best technique.</td>
</tr>
<tr>
<td></td>
<td>Lin et al., 1992 (159)</td>
<td>62:48 Randomized controlled trial</td>
<td>Acupuncture at hégǔ (LI4) and sányínjǐào (SP6)</td>
<td>Oxytocin intravenous drip</td>
<td>Similar results were obtained in the two groups, but uterine contractions were less frequent and uterine motility was less marked in the test group.</td>
</tr>
</tbody>
</table>
|                                                     | Ma et al., 1995 (160) | 31:29:15:26 Randomized controlled trial | (1) Ear acupuncture at shènmèn, (2) Body acupuncture at sányínjǐào (SP6) or (3) Body acupuncture at yánglíngquán (GB34) | (4) No treatment | The duration of labour in the four groups was:  
  • (1) 4.47 ± 0.76 h  
  • (2) 6.80 ± 1.04 h  
  • (3) 9.79 ± 2.45 h  
  • (4) 10.20 ± 2.04 h. |
| Infertility, see Defective ejaculation; Hypo-ovarianism; Infertility due to inflammatory obstruction of fallopian tube; Male sexual dysfunction, non-organic |
| Infertility due to inflammatory obstruction of fallopian tube | Ji et al., 1996 (158) | 64:36:30 Randomized controlled trial | Manual acupuncture plus electric acupuncture plus moxibustion | Herbal medication or conventional Western medication (intrauterine injection of gentamicin, chymotrypsin and dexamethasone) | Results showed that the fallopian tube obstruction was totally removed in:  
  • 81.3% of the test group; in a 2-year follow-up, the pregnancy rate was 75%  
  • 55.6% and 56.7% of the control groups, respectively; in a 2-years follow-up, the pregnancy rates were 52.7% and 46.7%. |
| Insomnia                                            | Zhang, 1993 (110) | 60 per group Group comparison | Auricular acupressure | Medication (diazepam plus chlorohydrate) | After 1 month of treatment, sleep was restored to normal or markedly improved in:  
  • 59/60 in the test group  
  • 20/60 in the control group. |
|                                                     | Luo et al., 1993 (109) | 60 per group Randomized controlled trial | Auricular acupressure | Medication (phenobarbital, methaqualone or meprobamate) | After the course of treatment, sleep improved in:  
  • 96.7% of the test group  
  • 35.0% of the control group. |
| Irritable bladder, see Female urethral syndrome     |
| Irritable colon syndrome                             | Wu et al., 1996 (133) | 41:40 Randomized controlled trial | Moxibustion | Western medication | After 2.5–3 months of treatment, a therapeutic effect was observed in:  
  • 92.7% of test group (improvement in 53.7%)  
  • 62.5% of control group (improvement in 37.5%). |
<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knee pain</td>
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</tbody>
</table>
| Maruno, 1976   | 26:26| Randomized controlled trial | Electric acupuncture | Manual acupuncture | Good results (complete alleviation of pain) were observed in:  
• 17/26 in the test group (average no. of treatments required, 6)  
• 11/26 in the control group (average no. of treatments required, 10). |
| Christensen et al., 1992 | 14:15| Randomized controlled trial, independent assessment | Acupuncture | No treatment (waiting for surgery) | Reduction in pain, analgesic consumption and objective measurements were significantly greater in the test group. |
| Berman et al., 1999 | 73  | Randomized controlled trial | Acupuncture | Standard care (weight loss, physical and occupational therapy, medication) | Improvement according to the Western Ontario and McMaster Universities Osteoarthritis Index and Lequesne indices was superior in test group. |
| Labour, see Induction of labour; Labour pain | | | | | |
| Labour pain    |     |        |            |               |         |
| Zhang et al., 1995 | 150:150| Randomized controlled trial with independent assessment | Body plus ear acupuncture | No treatment | Acupuncture yielded a good analgesic effect and expedited the opening of the uterine ostium. |
| Lactation deficiency | | | | | |
| Chandra et al., 1995 | 15:15| Randomized controlled trial | Electric acupuncture | No acupuncture | Lactation increased by:  
• 92% in the test group  
• 30.9% in the control group.  
The difference was statistically significant. |
| Leukopenia      |     |        |            |               |         |
| Chen et al., 1991 | 121:117:34| Randomized controlled trial | Acupuncture or moxibustion | Medication (batilol plus cysteine phenylacetate) | Effective rates after 9 days of treatment were:  
• 88.4% in the acupuncture group  
• 91.5% in the moxibustion group  
• 38.2% in the medication group. |
| Chen et al., 1990 | 57:34| Randomized controlled trial | Moxibustion | Medication (batilol plus cysteine-phenylacetate) | Effective rates after 9 days of treatment were:  
• 89.5% in the test group  
• 38.2% in the control group. |
| Yin et al., 1990 | 30:27| Randomized controlled trial | Acupuncture | Medication (cysteine-phenylacetate) | Effective rates after 6 weeks of treatment were:  
• 83.3% in the test group  
• 53.4% in the control group. |
<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acupuncture: review and analysis of controlled clinical trials</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Yin et al., 1992 (144) (benzene-induced)</td>
<td>30:25</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Medication (rubidate)</td>
<td>Acupuncture was superior to rubidate in improving symptoms and increasing leukocyte count; effective rates were: • 91% in the test group • 68% in the control group.</td>
</tr>
<tr>
<td>Wang, 1997 (142) (chemotherapy-induced)</td>
<td>49:34</td>
<td>Randomized controlled trial</td>
<td>Moxibustion</td>
<td>Medication (batilol plus cysteine-phenylacetate)</td>
<td>Effective rates were: • 82% in the test group • 50% in the control group.</td>
</tr>
<tr>
<td>Low back pain (see also Sciatica; Spine pain, acute)</td>
<td></td>
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</tr>
<tr>
<td>Gunn et al., 1980 (46)</td>
<td>29:27</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Standard therapy (physical therapy, remedial exercises, etc.)</td>
<td>Return to original or equivalent work or to lighter work, respectively, was possible in: • 18/29 and 10/29 in the test group • 4/27 and 14/27 in the control group.</td>
</tr>
<tr>
<td>Coan et al., 1980 (45)</td>
<td>25:25</td>
<td>Randomized controlled trial</td>
<td>Acupuncture and electric acupuncture</td>
<td>No treatment (waiting list)</td>
<td>Improvement was observed in: • 19/25 in the test group • 5/25 in the control group.</td>
</tr>
<tr>
<td>Mendelson et al., 1983 (49)</td>
<td>95</td>
<td>Randomized single-blind crossover with independent assessment</td>
<td>Acupuncture</td>
<td>Lidocaine injection plus sham acupuncture</td>
<td>Improvement was observed in: • 26 in the test group • 22 in the control group.</td>
</tr>
<tr>
<td>MacDonald et al., 1983 (48)</td>
<td>8:9</td>
<td>Randomized controlled trial</td>
<td>Acupuncture and electric acupuncture</td>
<td>Mock TENS</td>
<td>Combined average reduction (pain score, activity pain, physical signs) was: • 71.4% in the acupuncture group • 21.4% in the control group.</td>
</tr>
<tr>
<td>Lehmann et al., 1986 (47)</td>
<td>17:18:18</td>
<td>Randomized controlled trial</td>
<td>Electric acupuncture</td>
<td>TENS or mock TENS</td>
<td>There was a significantly greater gain in various measures in the test group during a 3-week in-patient treatment period and at 6-month follow-up.</td>
</tr>
<tr>
<td>Male sexual dysfunction, non-organic (see also Defective ejaculation)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Success rates were: • 60% in the acupuncture group • 75% in the group treated with hypnotic suggestion • 43–47% in the placebo group.</td>
</tr>
</tbody>
</table>

48 120
### 4. Summary table of controlled clinical trials

<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malposition of fetus, correction of Qin et al., 1989</td>
<td>100:40</td>
<td>Group comparison</td>
<td>Auricular acupressure</td>
<td>Knee-chest position</td>
<td>Success rates were:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• 92.9% in the test group</td>
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<td></td>
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<td></td>
<td>• 67.5% in the control group.</td>
</tr>
<tr>
<td></td>
<td>Li et al., 1990</td>
<td>27:27:20</td>
<td>Group comparison</td>
<td>Moxibustion at zúlínqì (GB41)</td>
<td>After 1 week of treatment, successful transposition occurred in:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Moxibustion at zhiyīn (BL67)</td>
<td></td>
<td>• 51.9% of the test group</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• 22.2% and 15%, respectively, in the control groups.</td>
</tr>
<tr>
<td></td>
<td>Li et al., 1996</td>
<td>48:31</td>
<td>Group comparison</td>
<td>Electric acupuncture at zhiyīn (BL67)</td>
<td>Efficacy was markedly superior in the test group.</td>
</tr>
<tr>
<td></td>
<td>Cardini et al., 1998</td>
<td>130:130</td>
<td>Randomized controlled trial</td>
<td>Moxibustion at zhiyīn (BL67)</td>
<td>Among primigravidas with breech presentation during the 33rd week of gestation, moxibustion for 1–2 weeks increased fetal activity during the treatment period and resulted in cephalic presentation after treatment period &amp; at delivery.</td>
</tr>
<tr>
<td>Menière disease</td>
<td>Zhang et al., 1983</td>
<td>33:32</td>
<td>Randomized controlled trial with partial crossover</td>
<td>Acupuncture</td>
<td>After 15 days of treatment, the syndrome was relieved in:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Conventional Western medicine (betahistine, nicotinic acid, vitamin B6, cinnarizine)</td>
<td>• 25 in the test group (ameliorated in 1), with relief usually occurring immediately after treatment</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>• 16 in the control group (ameliorated in 2).</td>
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<tr>
<td></td>
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<td></td>
<td>Of the 7 unaffected acupuncture patients, 5 returned to receive medication; all remained unimproved. Of the 14 unaffected control patients, 6 returned to receive acupuncture; 2 were cured and 1 improved. Effective rates were:</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>• 74.4% in 39 courses of acupuncture treatment</td>
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<td></td>
<td>• 48.6% in 37 courses of medication.</td>
</tr>
<tr>
<td>Migraine, see Headache</td>
<td>Dundee et al., 1988</td>
<td>119:112:119</td>
<td>Randomized controlled trial</td>
<td>Acupressure at nèiguànn (PC6) or sham acupressure ( a point near right elbow)</td>
<td>Troublesome sickness was significantly less in the acupressure (23/119) and sham acupressure (41/112) groups than in the control group (67/119).</td>
</tr>
<tr>
<td>Condition/Study</td>
<td>No.</td>
<td>Design</td>
<td>Test group</td>
<td>Control Group</td>
<td>Results</td>
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<td>-------------------------------------------------------------------------</td>
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<tr>
<td>De Aloysio et al., 1992 (258)</td>
<td>66</td>
<td>Randomized controlled trial</td>
<td>Acupressure at nèiguān (PC6)</td>
<td>Sham acupressure</td>
<td>Effective rates were:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• 60% in the test group</td>
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<td></td>
<td></td>
<td></td>
<td>• 30% in the control group</td>
</tr>
<tr>
<td>Bayreuther et al., 1994 (259)</td>
<td>23</td>
<td>Randomized single-blind crossover</td>
<td>Acupressure at nèiguān (PC6)</td>
<td>Sham acupressure</td>
<td>Effective rates were:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with independent assessment</td>
<td></td>
<td></td>
<td>• 69% in the test group</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>• 31% in the control group</td>
</tr>
<tr>
<td>Fan, 1995 (163)</td>
<td>151:151</td>
<td>Randomized group comparison</td>
<td>Moxibustion</td>
<td>Herbal medication</td>
<td>Cure rates after 1 week of treatment were:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• 96.7% in the test group</td>
</tr>
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<td></td>
<td>• 58.9% in the control group</td>
</tr>
<tr>
<td><strong>Nausea and vomiting</strong></td>
<td></td>
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<tr>
<td>Dundee et al., 1986 (260)</td>
<td>25 per group</td>
<td>Group comparison</td>
<td>(1) Acupuncture plus meptazinol, (2) Acupuncture plus nalbuphine</td>
<td>(3) Meptazinol, (4) Sham acupuncture plus nalbuphine, (5) Nalbuphine</td>
<td>Vomiting in group (1) was half that in group (3). There was a significantly lower incidence of emetic episodes in the acupuncture groups (1) and (2) than in the control groups (3), (4) and (5). There were no differences between the control groups (3), (4) and (5).</td>
</tr>
<tr>
<td>Dundee et al., 1987 (233)</td>
<td>10</td>
<td>Randomized crossover trial</td>
<td>Electric acupuncture at nèiguān (PC6)</td>
<td>Electric acupuncture at &quot;dummy&quot; point</td>
<td>Sickness was significantly lower in the test group.</td>
</tr>
<tr>
<td>Ghaly et al., 1987 (267)</td>
<td>31:31</td>
<td>Group comparison</td>
<td>Acupuncture plus electric acupuncture</td>
<td>Medication (cyclizine)</td>
<td>Acupuncture and electric acupuncture were as effective as medication.</td>
</tr>
<tr>
<td>Weightman et al., 1987 (262)</td>
<td>46</td>
<td>Double-blind randomized controlled</td>
<td>Acupuncture at nèiguān (PC6)</td>
<td>No acupuncture</td>
<td>Acupuncture performed during surgery under anaesthesia did not lead to a significant reduction in nausea or vomiting after surgery.</td>
</tr>
<tr>
<td>Dundee et al., 1989 (263)</td>
<td>20</td>
<td>Group comparison</td>
<td>Acupuncture at nèiguān (PC6)</td>
<td>Sham acupuncture</td>
<td>Effective rates were:</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>• 90% in the test group</td>
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<td></td>
<td>• 10% in the control group</td>
</tr>
<tr>
<td>Barsoum et al., 1990 (264)</td>
<td>162</td>
<td>Randomized controlled trial</td>
<td>Acupressure at nèiguān (PC6) by using bands (with pressure button)</td>
<td>Placebo bands (without pressure button) or injection of prochlorperazine</td>
<td>The severity of nausea was significantly reduced in the test group compared with the two control groups.</td>
</tr>
<tr>
<td>Condition/Study</td>
<td>No.</td>
<td>Design</td>
<td>Test group</td>
<td>Control Group</td>
<td>Results</td>
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<tr>
<td>Ho et al., 1990 (265) (postoperative)</td>
<td>25 per group</td>
<td>Group comparison</td>
<td>Electric acupuncture</td>
<td>Medication (intravenous prochlorperazine 5 mg) or TENS or no treatment</td>
<td>Emesis episodes were observed in:</td>
</tr>
<tr>
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<td></td>
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<td></td>
<td>• 3/25 in the electric acupuncture group</td>
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<td>• 3/25 in the medication group</td>
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<td>• 9/25 in the TENS group</td>
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<td></td>
<td></td>
<td></td>
<td>• 11/25 in the untreated group.</td>
</tr>
<tr>
<td>Ho et al., 1996 (266) (postoperative)</td>
<td>60</td>
<td>Randomized double-blind controlled trial</td>
<td>Acupressure bands (with pressure button)</td>
<td>Placebo bands (without pressure button)</td>
<td>Incidence of nausea and of vomiting, respectively was:</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td>• 3% and 0% in the test group</td>
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<td></td>
<td>• 43% and 27% in the control group.</td>
</tr>
<tr>
<td>Andrzejowski et al., 1996 (267) (postoperative)</td>
<td>36</td>
<td>Randomized controlled trial</td>
<td>Acupuncture with semipermanent needles</td>
<td>Placebo with needles inserted into sham points</td>
<td>Semipermanent acupuncture did not reduce the overall incidence of nausea and vomiting after abdominal hysterectomy but did reduce the severity of nausea in the second 24-h period and had a greater effect on patients who had nausea &amp; vomiting after a previous anaesthetic.</td>
</tr>
<tr>
<td>McConaghy et al., 1996 (269) (postoperative)</td>
<td>30:50</td>
<td>Randomized controlled trial</td>
<td>Acupuncture at nèguān (PC6)</td>
<td>Acupuncture at sham points</td>
<td>Patients were treated with acupuncture with manual stimulation for 4 min after developing post-operative nausea &amp; vomiting lasting more than 10 min:</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>• 53% of patients in the test group did not require further antiemetic treatment</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>• all patients in the control group required further antiemetic treatment.</td>
</tr>
<tr>
<td>Schwager et al., 1996 (269) (postoperative)</td>
<td>84</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Placebo (no needle stimulation)</td>
<td>There was no statistically significant difference in total postoperative vomiting between the two groups.</td>
</tr>
<tr>
<td>Liu et al., 1997 (270) (cisplatin-associated)</td>
<td>184: 161:25: 25:23: 22:70</td>
<td>Randomized group comparison</td>
<td>Magnetic plate at nèguān (PC6): (1) 120 mT, (2) 60 mT or (3) 2000 mT</td>
<td>(4) 120 mT magnetic plate at zusānlī (ST36), (5) iron plate at nèguān (PC6), (6) steel bead at nèguān (PC6) or (7) medication (unspecified)</td>
<td>Total effective rates were significantly higher in the first two test groups:</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>• (1) 92.4%</td>
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<td></td>
<td></td>
<td>• (2) 89.4%</td>
</tr>
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<td></td>
<td></td>
<td>• other group rates ranged from 47.2% (7) to 0%.</td>
</tr>
<tr>
<td>Condition/Study</td>
<td>No.</td>
<td>Design</td>
<td>Test group</td>
<td>Control Group</td>
<td>Results</td>
</tr>
<tr>
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<td>---------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Al-Sadi et al., 1997</td>
<td>81</td>
<td>Randomized controlled</td>
<td>Acupuncture</td>
<td>Placebo (no needle stimulation)</td>
<td>The use of acupuncture reduced the incidence of postoperative nausea or vomiting in hospital from 65% to 35% (for day cases) and from 69% to 31% (after discharge).</td>
</tr>
<tr>
<td>(postoperative)</td>
<td></td>
<td>trial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stein et al., 1997</td>
<td>75</td>
<td>Randomized double-blind</td>
<td>Acupressure bands plus intravenous</td>
<td>Placebo bands plus intravenous metoclopramide or</td>
<td>Patients who received either acupressure or placebo bands plus metoclopramide prior to initiation of spinal anaesthesia for caesarean section experienced much less nausea than patients in the placebo band plus saline group.</td>
</tr>
<tr>
<td>(postoperative)</td>
<td></td>
<td>controlled trial</td>
<td>saline</td>
<td>placebo bands plus intravenous saline</td>
<td></td>
</tr>
<tr>
<td>Schlager et al., 1998</td>
<td>40:20</td>
<td>Randomized double-blind</td>
<td>Laser stimulation of neiguan (PC6)</td>
<td>Placebo laser</td>
<td>The incidence of vomiting after strabismus surgery was significantly different for</td>
</tr>
<tr>
<td>(postoperative)</td>
<td></td>
<td>controlled trial</td>
<td></td>
<td></td>
<td>• 25% in the test group&lt;br&gt; • 85% in the control group.</td>
</tr>
<tr>
<td>Chu et al., 1998</td>
<td>34:31</td>
<td>Randomized controlled</td>
<td>Acupressure using non-invasive vital</td>
<td>Placebo acupressure</td>
<td>The overall incidence of vomiting in a 24-h period after strabismus surgery was:</td>
</tr>
<tr>
<td>(postoperative)</td>
<td></td>
<td>trial assessed by evaluator</td>
<td>point needleless acuplaster (Koa,</td>
<td></td>
<td>• 29.4% in the test group&lt;br&gt; • 64.5% in the control group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>blind to treatment</td>
<td>Japan)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alkaissi et al., 1999</td>
<td>20:20</td>
<td>Randomized controlled</td>
<td>Acupressure with wrist band</td>
<td>Placebo with or without wrist band</td>
<td>Nausea decreased after 24 h in all groups but vomiting and need of relief antiemetic was reduced only in the test group.</td>
</tr>
<tr>
<td>(postoperative)</td>
<td>20</td>
<td>trial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shenkman et al., 1999</td>
<td>100</td>
<td>Randomized controlled</td>
<td>Acupuncture plus acupressure</td>
<td>Acupuncture at sham points</td>
<td>Perioperative acupressure and acupuncture did not diminish emesis in children following tonsillectomy.</td>
</tr>
<tr>
<td>(postoperative)</td>
<td></td>
<td>trial</td>
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<tr>
<td><strong>Neck pain</strong></td>
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<tr>
<td>Coan et al., 1982</td>
<td>15:15</td>
<td>Randomized controlled</td>
<td>Acupuncture plus electric acupuncture</td>
<td>No treatment (waiting list)</td>
<td>Mean pain scores were reduced by:</td>
</tr>
<tr>
<td>(35)</td>
<td></td>
<td>trial</td>
<td></td>
<td></td>
<td>• 40% in the test group; improvement in 12/15&lt;br&gt; • 2% in the control group; improvement in 2/15.</td>
</tr>
<tr>
<td>Loy, 1983</td>
<td>26:27</td>
<td>Randomized controlled</td>
<td>Electric acupuncture</td>
<td>Physiotherapy</td>
<td>Improvement was observed in:</td>
</tr>
<tr>
<td>(36)</td>
<td></td>
<td>trial</td>
<td></td>
<td></td>
<td>• 67.4% of the test group at 3 weeks, 87.2% at 6 weeks&lt;br&gt; • 51.3% of the control group at 3 weeks, 53.9% at 6 weeks.</td>
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<tr>
<td>Condition/Study</td>
<td>No.</td>
<td>Design</td>
<td>Test group</td>
<td>Control Group</td>
<td>Results</td>
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</table>
| Petrie et al., 1986 (37) | 13:12 | Randomized controlled trial | Acupuncture                 | Mock TENS                      | At 1-month follow-up, daily pill count and disability scores, respectively:  
  • decreased by 23.5% and 24.6% in the test group  
  • increased by 8.4% and 8.4% in control group. |
| David et al., 1998 (34) | 35:35 | Randomized controlled trial | Acupuncture                 | Physiotherapy                   | Both groups improved in respect of pain and range of movement of neck. Acupuncture was slightly more effective in patients who had higher baseline pain scores. |
| Birch et al., 1998 (33) | 46    | Randomized controlled trial | Acupuncture at specific sites relevant for neck pain or acupuncture at specific sites not relevant for neck pain | Nonsteroid anti-inflammatory medication | Relevant acupuncture contributed to modest pain reduction in persons with myofascial neck pain. The relevant acupuncture group had significantly greater pre- and post-treatment differences in pain than the non-relevant acupuncture and medication groups. |
| Neuralgia, post-herpetic |       |                 |                             |                                |                                                                                                                                      |
| Lewith et al., 1983 (103) | 30:32 | Randomized controlled trial | Auricular plus body acupuncture | Placebo (mock TENS)              | There were no differences in the pain recorded in the two groups during or after treatment. There was a significant improvement in pain at the end of treatment in 7 patients of the placebo group and 7 patients of the acupuncture group. |
| Sukandar et al., 1995 (104) | 7:7    | Randomized controlled trial | Acupuncture at jiājǐ (EX-B2) on affected side plus amitriptyline–trifluoperazine combo (amitriptyline 5 mg + trifluoperazine 0.5 mg per tablet), one tablet twice a day | Acupuncture at jiājǐ (EX-B2) on contralateral side plus an amitriptyline–trifluoperazine combination | There was a significant difference in analgesia between the test and control groups. Analgesia was excellent in:  
  • all patients in the test group after 6 sessions  
  • none of the patients in the control group. |
| Neurodermatitis |       |                 |                             |                                |                                                                                                                                      |
| Huang et al., 1998 (227) | 60:60 | Randomized controlled trial | Acupuncture with seven-star needles | Conventional local treatment | Cure rates were:  
  • 100% in the test group  
  • 16.7% in the control group. |
| Neuropathic bladder in spinal cord injury |       |                 |                             |                                |                                                                                                                                      |
| Cheng et al., 1998 (277) | 40:40 | Controlled trial | Electric acupuncture       | Conventional bladder-training programme | Times taken to achieve balanced voiding were:  
  • $57.1 \pm 22.6$ days in the test group  
  • $85.2 \pm 27.4$ days in the control group.  
  The difference was statistically significant. |
<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
</table>
| **Obesity** (see also Simple obesity in children) Richards et al., 1998 (238) | 60 | Randomized controlled trial | Auricular acupuncture | Sham acupuncture | Suppression of appetite was noticed in:  
• 95% of the test group  
• 0% of the control group. |
| **Opium dependence, see Dependence, opium, cocaine, heroin** |
| **Osteoarthritis** Junnila, 1982 (55) | 16:16 | Group comparison (sequential) | Acupuncture | Medication (piroxicam) | Pain was relieved by:  
• 61% 1 month after a series of acupuncture treatments; no side-effects  
• 32% after 4 months of piroxicam therapy; itching of the skin, intestinal bleeding, or tiredness occurred in 19%. |
| **Pain, see Abdominal pain in acute gastroenteritis; Biliary colic; Cancer pain; Dental pain; Dysmenorrhoa, primary; Earache; Epigastralgia, acute; Eye pain due to subconjunctival injection; Facial pain (including craniofacial disorders); Gastrointestinal spasm; Headache; Knee pain; Labour pain; Low back pain; Neck pain; Neuralgia, post-herpetic; Osteoarthritis; Pain due to endoscopic examination; Pain in thromboangiitis obliterans; Periarthritis of shoulder; Plantar pain due to fasciitis; Postoperative pain; Radicular and pseudoradicular pain syndromes; Renal colic; Sciatica; Sore throat; Spine pain, acute; Sprain; Stiff neck; Tennis elbow** |
| **Pain due to endoscopic examination** Wang et al., 1992 (135) (colonoscopy) | 100:100 | Group comparison | Acupuncture | Standard medication (scopolamine butylbromide, pethidine) | Analgesia was similar in the two groups but there were significantly fewer side-effects in the test group. |
| Wang et al., 1997 (136) (colonoscopy) | 30:29 | Randomized controlled trial | Electric acupuncture at zūsānli (ST36) and shāngjúxū (ST37) | Pethidine analgesia | Analgesia was similar in the two groups, but there were fewer side-effects in the test group. |
| **Pain in thromboangiitis obliterans** Qiu, 1997 (16) | 60:30 | Group comparison | Body acupuncture (manual) | Medication (intramuscular bucinnazine; also known as bucinperazine) | Effective rates were:  
• 93.4% in the test group; pain relief started 2–10 min after needling and lasted for 5.6 h  
• 56.7% in the control group; pain relief started 15–25 min after injection and lasted for 3.1 h. |
| **Periarthritis of shoulder** Kinoshita, 1973 (38) | 15:15 | Randomized controlled trial | Acupuncture at specific & basic points | Acupuncture at basic points alone | The therapeutic effect was superior in the test group; the difference was significant. |
| Shao, 1994 (39) | 62:62 | Randomized controlled trial | Acupuncture at érjìān (LI2) | Acupuncture at traditional points | Cure rates were:  
• 66.1% in the test group after 2.2 treatments  
• 31.7% in control groups after 8.2 treatments. |
<table>
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<tr>
<th>Condition/Study</th>
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<th>Design</th>
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<th>Control Group</th>
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<tbody>
<tr>
<td>Pertussis, see Whooping cough (pertussis)</td>
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<tr>
<td>Plantar pain due to fasciitis</td>
<td>50:48</td>
<td>Randomized controlled</td>
<td>Manual acupuncture</td>
<td>Conventional Western medication (clomifene)</td>
<td>Clinical cure (assessment of clinical symptoms, ultrasonographic examination and radioimmunoassay of sex hormones) was observed in: • 94% of the test group • 62.5% of the control group.</td>
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<tr>
<td>Postextubation in children</td>
<td>38:38</td>
<td>Randomized controlled</td>
<td>Acupuncture (blood-</td>
<td>No acupuncture</td>
<td>If laryngospasm developed, patients were immediately given acupuncture at shàoshāng (LU11) or zhōngfū (LU1). The laryngospasm was relieved within 1 min in all patients. The incidence of laryngospasm occurring after tracheal extubation in children was: • 5.3% in the test group • 23.7% in the control group.</td>
</tr>
<tr>
<td>Postoperative symptoms, closed craniocerebral injury</td>
<td>50:50</td>
<td>Randomized controlled</td>
<td>Conventional Western</td>
<td>Conventional Western medication (no further details available)</td>
<td>Clinical cure in was observed in: • 13 in the test group; marked improvement in 30; cure and improvement rate, 86% • 7 in the control group; marked improvement in 21; cure and improvement rate, 56%.</td>
</tr>
<tr>
<td>Postoperative convalescence</td>
<td>15:15</td>
<td>Group comparison</td>
<td>Body acupuncture</td>
<td>Routine medical treatment (intravenous piracetam)</td>
<td>Improvement of muscular strength and activities after 10 days of treatment was observed in: • 14 in the test group • 8 in the control group.</td>
</tr>
<tr>
<td>Postoperative pain</td>
<td>10:10</td>
<td>Randomized controlled</td>
<td>Electric acupuncture</td>
<td>No treatment</td>
<td>The pethidine requirements of each patient were recorded. The quantity of pethidine consumed by the test group was half that consumed by the control group.</td>
</tr>
<tr>
<td>Condition/Study</td>
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<td>Control Group</td>
<td>Results</td>
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<tr>
<td>Wang et al., 1990 (76) (after tonsillectomy)</td>
<td>33:33</td>
<td>Group comparison</td>
<td>Acupuncture</td>
<td>Medication (penicillin plus Dobell gargle)</td>
<td>Alleviation of pain, reduction in salivation and speed of wound healing were superior in the test group.</td>
</tr>
<tr>
<td>Lü et al., 1993 (74) (after anal surgery)</td>
<td>62:30</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Bucinnazine</td>
<td>A marked analgesic effect was obtained in: • 77% of the test group • 27% of the control group.</td>
</tr>
<tr>
<td>Tsibuliak et al., 1995 (75) (various)</td>
<td>229:91:229</td>
<td>Group comparison</td>
<td>Acupuncture</td>
<td>Electric stimulation or narcotic analgesics (omnopon (a Chinese opium alkaloid), trimeperidine)</td>
<td>Although less effective than narcotic analgesics, acupuncture provided adequate analgesia in 50% of patients, &amp; noticeably alleviated severity of postoperative complications (nausea, vomiting, retention of urine, intestinal paresis, impaired drainage function of bronchi).</td>
</tr>
<tr>
<td>Felhendler et al., 1996 (278) (after knee arthroscopy)</td>
<td>40</td>
<td>Randomized controlled trial</td>
<td>Acupressure (firm pressure across classical acupoints)</td>
<td>Placebo (light pressure in the same area)</td>
<td>60 min and 24 h after treatment, pain scores on a visual analogue scale were lower in the test group.</td>
</tr>
<tr>
<td>Chen et al., 1998 (71) (after abdominal hysterectomy or myomectomy)</td>
<td>25 per group</td>
<td>Randomized controlled trial</td>
<td>TENS at zusānli (ST36) or dermatomal TENS at the level of the surgical incision</td>
<td>Nonacupoint TENS or sham TENS (no electric current)</td>
<td>Peri-incisional dermatomal TENS and TENS at zusanli were equally effective in decreasing postoperative opioid analgesic requirement and in reducing opioid-related side effects. Both of these treatments were more effective than the nonacupoint or sham TENS.</td>
</tr>
<tr>
<td><strong>Premenstrual syndrome</strong></td>
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<tr>
<td>Li et al., 1992 (155)</td>
<td>108:108</td>
<td>Randomized group comparison</td>
<td>Acupuncture</td>
<td>Herbal medication</td>
<td>Total relief of symptoms with no recurrence in 6 months of follow-up was observed in: • 91.7% of the test group • 63% of the control group.</td>
</tr>
<tr>
<td><strong>Prostatitis, chronic</strong></td>
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<tr>
<td>Luo et al., 1994 (149)</td>
<td>100:81</td>
<td>Randomized controlled trial</td>
<td>Acupuncture at zhiān (BL54) and sānyīnjiāo (SP6)</td>
<td>Medication (oral sulfamethoxazole)</td>
<td>Relief of symptoms and improvement in sexual function were superior in the test group.</td>
</tr>
<tr>
<td><strong>Pruritus, experimentally induced</strong></td>
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<tr>
<td>Lunderberg et al., 1987 (226)</td>
<td>10</td>
<td>Randomized crossover trial</td>
<td>Manual or electric acupuncture</td>
<td>Placebo acupuncture (superficial insertion of needle with no specific sensation)</td>
<td>Acupuncture and electric acupuncture reduced subjective itch intensity more effectively than placebo acupuncture. The difference was significant. The results suggest that the two test procedures could be tried in clinical conditions associated with pruritus.</td>
</tr>
</tbody>
</table>
### Summary table of controlled clinical trials

<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pulmonary heart disease, chronic</strong></td>
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<td></td>
<td></td>
<td>After 1.5–2 months of treatment, improvement was observed in:</td>
</tr>
</tbody>
</table>
| Zou et al., 1998 (279)                      | 30:29| Randomized controlled trial           | Ginger moxibustion plus acupoint injection      | Routine Western treatment (oxygen inhalation, antibiotics and bronchodilators)            | • 27/30 (90%) of the test group; in 1-year follow-up, acute respiratory infection occurred in 7  
• 12/29 (41.4%) of the control group; in 1-year follow-up, acute respiratory infection occurred in 26.                                      |
| **Radicular and pseudoradicular pain syndromes** |      |                                      |                                                 |                                            | Laser acupuncture was more effective than placebo in 20 out of 21 patients.                                                               |
| Kreczi et al., 1986 (57)                    | 21   | Randomized single-blind crossover trial | Laser acupuncture                              | Mock laser acupuncture                     | Mean duration of the capillary flowstop reaction induced by local cooling test decreased from 71 s to 24 s (week 1 compared to week 12, \( P = 0.001 \)) in test group. Changes in control group weren’t significant. Authors concluded that Chinese acupuncture is a reasonable alternative in treating patients with primary Raynaud syndrome. There was a significant decrease in the frequency of attacks by: 63% in the test group and 27% in the control group. |
| **Raynaud syndrome, primary**               |      |                                      |                                                 |                                            | Proportions remaining free of lower urinary-tract infection during 6-month observation period were:                                      |
| Appiah et al., 1997 (244)                   | 17:16| Randomized controlled trial           | Acupuncture                                     | No treatment                               | • 85% in the acupuncture group  
• 58% in the sham acupuncture group  
• 36% in the untreated group.                                                                                                               |
| **Recurrent lower urinary-tract infection** |      |                                      |                                                 |                                            | Acupuncture was beneficial.                                                                                                              |
| Aune et al., 1998 (152)                     | 67   | Randomized controlled trial           | Acupuncture                                     | Sham acupuncture or no treatment          | Proportions remaining free of lower urinary-tract infection during 6-month observation period were:                                      |
| **Reflex sympathetic dystrophy**            |      |                                      |                                                 |                                            | • 85% in the acupuncture group  
• 58% in the sham acupuncture group  
• 36% in the untreated group.                                                                                                               |
| Kho, 1995 (280)                             | 28   | Double-blind placebo-controlled trial | Acupuncture                                     | Sham acupuncture                          | Acupuncture was beneficial.                                                                                                              |
| **Renal colic**                             |      |                                      |                                                 |                                            | Both groups experienced a significant decrease in pain levels, with the acupuncture group improving slightly more. Side-effects occurred in: |
| Lee et al., 1992 (65)                       | 22:16| Randomized controlled trial           | Acupuncture                                     | Medication (injection of a metamizole–camylofin combination)                            | • 0/22 in the test group  
• 7/16 in the control group.                                                                                                               |
<table>
<thead>
<tr>
<th>Condition/Study</th>
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<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
</table>
| Zhang et al., 1992 (7)  | 126:118      | Group comparison           | Acupuncture      | Medication (injection of atropine plus pethidine)   | An analgesic effect was observed in:  
  • 99.2% of the test group  
  • 71.2% of the control group. |
| Li et al., 1993 (66)    | 25:27        | Randomized controlled trial| Acupuncture      | Medication (injection of atropine plus promethazine and bucinnazine) | Relief of pain was observed in:  
  • all patients in the test group in 25 min on average  
  • 90% of the patients in the control group in 50 min. |
| Pan et al., 1996 (146)  | 76:32        | Randomized controlled trial| Acupuncture      | Medication (intramuscular neostigmine bromide)      | The therapeutic effect of acupuncture was markedly superior to that of neostigmine injection.  
| Retinopathy, central serous |             |                            | Acupuncture (manual) | Medication (rutoside, vitamin C, troxerutin)        | Cure rates were:  
  • 46/86 (49.5%) eyes in test group; average duration of treatment required, 50.6 days  
  • 52/146 (35.6%) eyes in control group; average duration of treatment required, 63.6 days. |
| Man et al., 1974 (4)    | 10:10        | Group comparison           | Electric acupuncture | Sham acupuncture                                    | Pain relief was observed in:  
  • 90% of the treatment group  
  • 10% of the control group. |
| Ruchkin et al., 1987 (5)| 10:6         | Double-blind controlled trial| Auricular electric-acupuncture | Sham electric acupuncture (no electrical stimulation) | Subjective improvement was observed in:  
  • all patients in the test group  
  • 1 patient in the control group. |
| Sun et al., 1992 (6)    | 378:56       | Group comparison           | Warming acupuncture | Acupuncture                                         | Marked improvement was observed in:  
  • 65.5% of the test group  
  • 26.8% of the control group. |
| Schizophrenia           |              |                            |                  | Medication (chlorpromazine)                         | After 6 weeks of treatment, marked improvement was observed in:  
  • 78% of the test group  
  • 39% of the control group. |
| Zhang et al., 1994 (282)| 38:31        | Randomized controlled trial| Electric acupuncture plus conventional medication (various) | Conventional medication (various)                       | The therapeutic effect was significantly greater in the test group. |
### Condition/Study

<table>
<thead>
<tr>
<th>Condition/Study</th>
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<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
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</thead>
<tbody>
<tr>
<td><strong>Sciatica</strong></td>
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<tr>
<td>Kinoshita, 1971 (50)</td>
<td>15:15</td>
<td>Randomized controlled trial</td>
<td>Acupuncture with deep insertion of needles (10–30 mm)</td>
<td>Acupuncture with superficial puncture (5 mm)</td>
<td>The therapeutic effect was greater in the test group. The difference was statistically significant.</td>
</tr>
<tr>
<td>Kinoshita, 1981 (51)</td>
<td>15:15</td>
<td>Randomized controlled trial</td>
<td>Acupuncture at dàchāngshū (BL25) with deep puncture (6 cm)</td>
<td>Acupuncture with superficial puncture (2 cm)</td>
<td>The therapeutic effect on tenderness, Lasegue's sign, and subjective symptoms was greater in the test group. The difference was significant.</td>
</tr>
<tr>
<td>Shen, 1987 (53)</td>
<td>50:50</td>
<td>Group comparison</td>
<td>Long-needle acupuncture</td>
<td>Classical acupuncture</td>
<td>Effective rates were:</td>
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<td>• 96% of the test group</td>
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<td>• 72% of the control group.</td>
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<tr>
<td>Li, 1991 (52)</td>
<td>100:70</td>
<td>Group comparison</td>
<td>Acupuncture at xiazhībian</td>
<td>Acupuncture at zhibiān (BL54)</td>
<td>Effective rates were:</td>
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<td></td>
<td>• 98% of test group after 15.8 treatments, on average</td>
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<td>• 81.4% of the control group after 27.7 treatments.</td>
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<tr>
<td><strong>Sexual dysfunction, see Defective ejaculation; Male sexual dysfunction, non-organic</strong></td>
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<td><strong>Sialorrhoea, antipsychotic-induced</strong></td>
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<tr>
<td>Xiong et al., 1993 (242)</td>
<td>60:60</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Anisodamine</td>
<td>After 10 days of treatment, marked reduction in salivation was achieved in:</td>
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<td>• 96.7% of the test group</td>
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<td></td>
<td>• 35.9% of the control group.</td>
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<tr>
<td><strong>Simple obesity in children</strong></td>
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<tr>
<td>Yu et al., 1998 (283)</td>
<td>101:101: 50</td>
<td>Randomized controlled trial</td>
<td>Photo-acupuncture or auricular acupressure</td>
<td>No treatment</td>
<td>The effects of photo-acupuncture and auricular acupressure were satisfactory, with better results for the former. After 3 months of acupuncture treatment, the obesity indices decreased significantly and levels of blood lipids, glucose, hydrocortisone and triiodothyronine were all markedly improved.</td>
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<tr>
<td><strong>Sjögren syndrome</strong></td>
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<tr>
<td>List et al., 1998 (243)</td>
<td>21</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>No treatment</td>
<td>A significant increase in paraffin-stimulated saliva secretion was found in both groups. There were no statistically significant differences in unstimulated salivary secretion between groups. The study showed that acupuncture is of limited value for patients with primary Sjögren syndrome.</td>
</tr>
</tbody>
</table>
### Condition/Study

<table>
<thead>
<tr>
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<th>Design</th>
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<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small airway obstruction</td>
<td>Chen et al., 1997 (284)</td>
<td>21:21:21 Randomized controlled trial</td>
<td>Body acupuncture (40 min)</td>
<td>Body acupuncture (20 min and 60 min)</td>
<td>Small airway function in bronchial asthma and chronic bronchitis improved in all three groups. The best result was obtained in the test group.</td>
</tr>
<tr>
<td>Smoking, see Dependence, tobacco</td>
<td>Gunsberger, 1973 (118)</td>
<td>100 per group Group comparison</td>
<td>Acupuncture at a single point or at 2 points</td>
<td>No treatment (acupuncture refusers) or petroleum jelly placebo</td>
<td>Results in the two treatment groups were significantly better than in the two control groups. At 48 h, 90% of those receiving acupuncture at 2 points were still reporting pain relief compared with only 30% of those receiving no treatment.</td>
</tr>
<tr>
<td>Sore throat (see also Tonsillitis, acute)</td>
<td>Santiesteban, 1984 (285)</td>
<td>5:5 Randomized controlled trial</td>
<td>Electric acupuncture</td>
<td>Selected physical therapy</td>
<td>The test group showed significant increases in range of motion, straight leg raising, &amp; decreased pain immediately after treatment. Control group showed no improvement.</td>
</tr>
<tr>
<td>Spine pain, acute (see also Low back pain; Sciatica)</td>
<td>Jin, 1991 (69) (lumbar)</td>
<td>346:50 Group comparison</td>
<td>Hand acupuncture</td>
<td>Medication (analgesic)</td>
<td>Pain was relieved after 1 session of treatment in:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• 32% of the test group (in 84% after 9 sessions)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• 0% of the control group (in 18% after 9 sessions).</td>
</tr>
<tr>
<td>Sprain</td>
<td>Wu, 1997 (286)</td>
<td>100:32 Group comparison</td>
<td>Acupuncture at laozhen</td>
<td>Medication (ibuprofen 0.3 g, 3 times per day)</td>
<td>Cure was observed in:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• 80/100 (80%) in the test group after the first session, 10 after the second, and 4 after the third; 6 did not respond in 3 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• 12/32 (38%) in the control group on the first day, 6 on the second, and 2 on the third; 12 did not respond in 3 days</td>
</tr>
</tbody>
</table>

**Stiff neck**

<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
</table>
### Summary table of controlled clinical trials

<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke Chen et al., 1990 (89) (ischaemic)</td>
<td>20 per group</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Medication (mannitol, dextrose, citicoline)</td>
<td>A better therapeutic effect (as assessed by EEG-map and somatosensory-evoked potential) was observed in the test group.</td>
</tr>
<tr>
<td>Stroke Zou et al., 1990 (287) (ischaemic)</td>
<td>32:31</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Medication (vinpocetine)</td>
<td>A better therapeutic effect was observed in the test group.</td>
</tr>
<tr>
<td>Stroke Bai et al., 1993 (88) (ischaemic)</td>
<td>40 per group</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Medication Beniol (a Chinese medicine containing linoleic acid, inositol &amp; other vitamins), troxerutin, nimodipine)</td>
<td>A better neurological outcome was observed in the test group.</td>
</tr>
<tr>
<td>Stroke Hu et al., 1993 (94) (ischaemic)</td>
<td>30:30</td>
<td>Randomized controlled trial</td>
<td>Physiotherapy plus acupuncture</td>
<td>Physiotherapy</td>
<td>A better neurological outcome was observed for physiotherapy plus acupuncture than for physiotherapy alone.</td>
</tr>
<tr>
<td>Stroke Jin et al., 1993 (99) (hemiplegia after stroke)</td>
<td>108:100</td>
<td>Randomized group comparison</td>
<td>Temporal acupuncture</td>
<td>Traditional body acupuncture</td>
<td>Significantly better results were obtained in the test group.</td>
</tr>
<tr>
<td>Stroke Liang, 1993 (100) (sequelae of stroke)</td>
<td>50:50</td>
<td>Randomized controlled trial</td>
<td>Temporal acupuncture</td>
<td>Traditional body acupuncture</td>
<td>Significantly better results were obtained in the test group.</td>
</tr>
<tr>
<td>Stroke Johansson et al., 1993 (95) (sequelae of stroke)</td>
<td>38:40</td>
<td>Randomized controlled trial</td>
<td>Acupuncture plus physiotherapy and occupational therapy</td>
<td>Physiotherapy and occupational therapy</td>
<td>A more rapid and more complete recovery was observed in the test group.</td>
</tr>
<tr>
<td>Stroke Zhang et al., 1994 (102) (stroke with aphasia)</td>
<td>22:22</td>
<td>Randomized controlled trial</td>
<td>Scalp electric acupuncture</td>
<td>No treatment</td>
<td>A more rapid and more complete recovery observed in the test group.</td>
</tr>
</tbody>
</table>
| Stroke Liao, 1997 (91) (hemiplegia after stroke) | 108:107 | Group comparison | Acupuncture at shōusānī (LI10) and fūtū (ST32) | Routine medication plus hyperbaric oxygenation | Marked improvement after 20 days of treatment was observed in:  
  • 66.7% of the test group  
  • 29.0% of the control group. |
<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
</table>
| Jiang et al., 1997 (90) (spontaneous limb pain after stroke) | 30:30 | Randomized controlled trial         | Electric acupuncture         | Conventional Western medication (carbamazepine) | After 30 days of treatment, the two groups showed similar amelioration of pain. Effective rates were:  
- 90% in the test group  
- 86.7% in the control group. |
| Liu et al., 1997 (92) (myodynamia after stroke)        | 78:56:30 | Group comparison                    | Scalp or body acupuncture     | Medication                                          | Functional recovery was observed in:  
- 75.6% of the scalp acupuncture group; total effective rate 98.7%  
- 51.8% of the body acupuncture group; total effective rate 92.8%  
- 16.7% control group; total effective rate 80%. |
| Kjendahl et al., 1997 (97) (subacute stroke)            | 21:20 | Randomized controlled trial         | Rehabilitation programme plus acupuncture | Rehabilitation programme | The test group improved significantly more than the control group during the treatment period of 6 weeks, and even more during the following year, according to motor-assessment scale, ADL, Nottingham health profile and social situation. |
| Gosman-Hedstrom et al., 1998 (96) (acute stroke)        | 104  | Randomized controlled trial         | Conventional rehabilitation plus superficial acupuncture | Conventional rehabilitation or conventional rehabilitation alone | There were no differences between the groups in respect of changes in the neurological score and the Barthel and Sunnaas activities of daily living index scores after 3 and 12 months. |
| Si et al., 1998 (93) (acute ischaemic stroke)            | 42   | Randomized controlled trial         | Electric acupuncture plus medication | Medication                                          | Clinical functional recovery was significantly better in the test group. |
| Wong et al., 1999 (98) (hemiplegia after stroke)         | 59:59 | Randomized controlled trial         | Electric acupuncture plus rehabilitation | Rehabilitation | Patients in the test group had a shorter hospital stay for rehabilitation and better neurological and functional outcomes than those in the control group, with a significant difference in scores for self-care and locomotion. |

<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporomandibular joint dysfunction (see also Facial pain, including craniomandibular disorders)</td>
<td>25:25</td>
<td>Randomized controlled trial</td>
<td>Acupuncture</td>
<td>Standard stomatognathic treatment</td>
<td>Both treatments resulted in a significant reduction in symptoms and signs. Acupuncture seems to be useful as a complementary treatment, especially in cases with evidence of physiological or neuromuscular disturbances.</td>
</tr>
</tbody>
</table>
## 4. Summary table of controlled clinical trials

<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tennis elbow</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Brattberg, 1983 (42) | 34:26 | Group comparison | Acupuncture | Steroid injection | Improvement was observed at follow-up in:  
  • 61.8% of the test group  
  • 30.8% of the control group. |
| Haker et al., 1990 (43) | 44:38 | Randomized group comparison | Classical acupuncture | Superficial acupuncture | Short-term improvement was significantly greater in the test group. |
| Molsberger et al., 1994 (44) | 24:24 | Placebo-controlled, single-blind trial with independent evaluation | Acupuncture | Placebo (acupuncture, avoiding penetration of the skin) | Pain relief of at least 50% after 1 treatment was reported by:  
  • 19 of the test group; average duration of analgesia after 1 treatment, 20.2 h  
  • 6 of the control group; average duration of analgesia after 1 treatment, 1.4 h. |
| **Tietze syndrome** |     |        |            |               |         |
| Yang, 1997 (246) | 108:64 | Group comparison | Acupuncture (manual) plus cupping | Routine medication (oral indometacin and local injection of prednisolone or procaine) plus physiotherapy | After 3 weeks of treatment, cure was observed in:  
  • 70/108 (64.8%) in the test group  
  • 24/64 (37.5%) in the control group. |
| **Tinnitus** |     |        |            |               |         |
| Jin et al., 1998 (220) (subjective) | 35:35 | Randomized controlled trial | Body acupuncture | Routine medication, including anisodamine | After 6 weeks of treatment cure was observed in:  
  • 8 (22.9%) in the test group; 10 (28.6%) markedly improved  
  • 2 (5.7%) in the control group; 6 (17.1%) markedly improved. |
| Vilholm et al., 1998 (221) (severe) | 54 | Randomized controlled crossover trial | Body acupuncture | Placebo | There was no statistically significant difference between the two groups. |
| **Tonsillitis, acute** |     |        |            |               |         |
| Chen, 1987 (117) | 220:50 | Group comparison | Acupuncture | Antibiotics (penicillin, etc.) | Earlier relief of fever and sore throat was observed in the test group. |
| **Tourette syndrome** |     |        |            |               |         |
| Tian et al., 1996 (217) | 68:17 | Randomized controlled trial | Body acupuncture plus auricular acupressure | Conventional Western medication (haloperidol) | Cure was observed in:  
  • 30.9% of the test group; effective rate at 6-month follow-up, 46/57 (89.7%)  
  • 11.8% of the control group; effective rate at 6-month follow-up, 5/13 (69.7%) in the control group. |
<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
</table>
| Jin, 1998 (216) | 30:30 | Randomized controlled trial | Body acupuncture plus auricular acupressure | Conventional Western medication (haloperidol) | After 1 month of treatment, clinical cure with no recurrence at 6-month follow-up in:  
  - 30.0% of test group; overall effective rate 93.4%  
  - 6.7% of control group; overall effective rate 76.7%. |
| Ulcerative colitis, chronic | Wu et al., 1995 (134) | 24:11 | Group comparison | Moxibustion with herbal partition | Sulfasalazine | After 3 months of treatment, clinical cure was observed in:  
  - 13/24 (54%) in test group; improvement in 10  
  - 3/11 (27%) in the control group; improvement in 4.  
  The difference was significant. |
| Ma et al., 1997 (289) | 60:30 | Randomized controlled trial | Body acupuncture plus moxibustion. | Sulfasalazine plus metronidazole | After 30 days of treatment, cure (assessed both clinically and endoscopically) was observed in:  
  - 76.7% of the test group  
  - 56.7% of the control group. |
| Urinary tract problems, see Female urethral syndrome; Neuropathic bladder in spinal cord injury; Recurrent lower urinary tract infection; Renal colic; Urolithiasis | Zhang et al., 1992 (7) | 126:118 | Group comparison | Acupuncture | Fluid infusion plus herbal medication | Cure (elimination of symptoms and signs and no residual stones revealed by X-ray or ultrasound examination) was observed in:  
  - 90.48% of the test group  
  - 33.05% of the control group. |
| Vascular dementia | Lai, 1997 (290) | 30:30 | Randomized controlled trial | Manual plus electric acupuncture | Aniracetam | Improvement after 6 weeks of treatment was observed in:  
  - 26 (86.7%) of the test group  
  - 19 (63.3%) of the control group. |
| Liu et al., 1998 (291) | 60:60:30 | Randomized controlled trial | (1) Scalp electric acupuncture  
(2) Nimodipine,  
(3) Electric acupuncture plus medication (nimodipine), or  
(4) No treatment | Assesment by various neuropsychological scales showed that effects of test & control procedures were comparable. After 8 weeks of treatment, assessment (of memory, intelligence and ability to take care of oneself) showed improvement in:  
  - 68.3% of group (1)  
  - 71.6% of group (2)  
  - 73.3% of group (3)  
  - 23.3% of group (4). |
<table>
<thead>
<tr>
<th>Condition/Study</th>
<th>No.</th>
<th>Design</th>
<th>Test group</th>
<th>Control Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jiang et al., 1998 (292)</td>
<td>33:33</td>
<td>Randomized controlled trial</td>
<td>Electric acupuncture</td>
<td>Dihydroergotoxine</td>
<td>Results were superior in the test group, as assessed by the Hasegawa dementia scale and functional activities questionnaire, increase in superoxide dismutase and decreases in lipid peroxide and nitric oxide.</td>
</tr>
<tr>
<td>Viral encephalitis in children, late stage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Wang, 1998 (293)                        | 72:42     | Group comparison                | Scalp electric and manual acupuncture plus routine medication as for control group | Routine medication (including antiviral and anti-inflammatory agents, and nutrients for brain tissue) | Effective rates were:  
  - 59/72 (81.9%) in the test group  
  - 19/42 (45.2%) in the control group. |
| Whooping cough (pertussis)              |           |                                 |                         |                        |                                                                                                                                 |
| Yao et al., 1996 (87)                   | 145:50    | Randomized controlled trial     | Acupuncture at bāxié (EX-UE9) | Chloramphenicol intravenous drip | After 7 days of treatment, cure was observed in:  
  - 98.6% of the test group  
  - 10% of the control group. |
References


Acupuncture: review and analysis of controlled clinical trials


165. Li GR et al. [Correction of abnormal foetal position by moxibustion in 74 cases.] *Journal of Acupuncture-Moxibustion*, 1990, 30(3):11 [in Chinese].


228. Li HQ et al. [Acupuncture treatment in 42 cases of acne vulgaris.]
229. Wang J et al. [Auriculo-acupuncture treatment of 32 cases of facial acne vulgaris.]
230. Dang W et al. [Clinical study on acupuncture treatment of pain caused by stomach cancer.]
231. Dan Y et al. [Clinical study on analgesic effect of acupuncture on carcinomatous pain.]
232. Chen GP et al. [Observation of therapeutic effects of acupuncture in 44 cases with gastrointestinal reaction induced by radiotherapy and chemotherapy.]


Cost effectiveness analysis of a randomised trial of acupuncture for chronic headache in primary care

David Wonderling, Andrew J Vickers, Richard Grieve, Rob McCarney

Abstract

Objectives To evaluate the cost effectiveness of acupuncture in the management of chronic headache.

Design Cost effectiveness analysis of a randomised controlled trial.

Setting General practices in England and Wales.

Participants 401 patients with chronic headache, predominantly migraine.

Interventions Patients were randomly allocated to receive up to 12 acupuncture treatments over three months from appropriately trained physiotherapists, or to usual care alone.

Main outcome measure Incremental cost per quality adjusted life year (QALY) gained.

Results Total costs during the one year period of the study were on average higher for the acupuncture group (£409; $768; £508) than for controls (£217) because of the acupuncture practitioners’ costs. The mean health gain from acupuncture during the one year of the trial was 0.021 quality adjusted life years (QALYs), leading to a base case estimate of £9180 per QALY gained. This result was robust to sensitivity analysis. Cost per QALY dropped substantially when the analysis incorporated likely QALY differences for the years after the trial.

Conclusions Acupuncture for chronic headache improves health related quality of life at a small additional cost; it is relatively cost effective compared with a number of other interventions provided by the NHS.

Introduction

Migraine and chronic tension headache represent a considerable societal burden in terms of both costs to the health service—for example, for prescription drugs and visits to general practitioners—and also the costs of lost productivity because of reduced effectiveness and time off work.1,2 We have not found recent estimates of the total economic burden of migraine for the United Kingdom. A decade ago the annual costs to the health service were estimated to be between £25m and £30m.3 Since these studies were published health service costs have probably increased, given the prescription of more expensive drugs (such as the triptans). The relatively modest observed costs to the health service are often attributed to low consultation rates, poor recognition of disease, and underprescribing.4 A much greater burden is the cost to the economy of lost productivity: in the early 1990s this was estimated to be between £250m and £611m annually.

Public and scientific interest is increasing in acupuncture as an approach for chronic headache disorders. Although several randomised studies have been conducted,1 few reliable data are available on the cost effectiveness of this intervention. We present a cost effectiveness analysis carried out alongside a randomised trial that seeks to assess the value for money of acupuncture for chronic headache (ISRCTN96537534).

Methods

In the trial 401 patients aged 18-65 who reported an average of at least two headaches per month were recruited from general practices in England and Wales and randomly allocated to receive either up to 12 acupuncture treatments over three months from appropriately trained physiotherapists or usual care alone.5

For the purposes of this evaluation we assume that the acupuncture intervention to be provided in the community by the NHS; hence we measure costs from both an NHS perspective and a societal perspective. We measured effectiveness in terms of the quality adjusted life years (QALYs) gained. For our base case, we have taken a conservative approach by excluding savings in productivity costs and by adopting a time horizon of 12 months, the length of the trial follow up. Given the time horizon, no need arose to discount costs or effects. We measured costs in UK prices (£) for 2002-3. We used the algorithm devised by Brazier et al,7 a single index measure of health related quality of life (HRQoL)—the SF-6D—to calculate for each patient at baseline, three months, and 12 months from patients’ responses to the SF-36 at each of these time points.

The patients themselves reported unit costs associated with non-prescription drugs and private healthcare visits. We used the health component of the harmonised index of consumer prices (HICP) to inflate these costs to 2003 levels.8 Table 1 details other unit costs. We used standard NHS costs for a specific service if these had been published.9 For NHS visits to practitioners of complementary or alternative medicine we used the mean cost of a private visit, as recorded in the trial. We recorded drug prescriptions for a subgroup of patients (n = 71) from the database of their general practitioner.

To estimate the cost of the study intervention we took the standard cost (including overheads, capital, and training) for an NHS community physiotherapist and multiplied it by the contact time for each individual patient with the physiotherapist trained in acupuncture. We did not include the cost of needles and other consumables as these are negligible compared with staff time.10 We assumed that acupuncture sessions on the NHS, but not by a study acupuncturist, had a duration equal to the mean duration of a study session, 31 minutes.

We used linear regression (analysis of covariance, ANCOVA) with age, sex, diagnosis (migraine or non-migraine...
A BMJ paper discussing cost effectiveness analysis in healthcare, specifically mentioning the use of QALYs (Quality Adjusted Life Years) in evaluating the cost-effectiveness of interventions. The text includes details on how costs were estimated and how the data was analyzed to determine the probability that the incremental cost effectiveness is below a threshold of cost effectiveness consistent with decisions that have been taken by the National Institute for Clinical Excellence (NICE).

The paper also discusses the use of regression models to estimate parametric cost effectiveness acceptability curves. It mentions the importance of using regression analysis to estimate cost effectiveness ratios and how these estimates can be used to make decisions about the cost-effectiveness of different interventions.

In Table 1, the unit costs for different healthcare services are listed, including acupuncture, physiotherapy, and various private health care costs. The table also includes details on the unit cost and source of unit cost for each service.

In Table 2, the characteristics of patients for whom QALYs could be calculated are shown. The table includes information on age, gender, migraine status, and other relevant characteristics.

Results section mentions the use of statistical methods such as linear regression and SPSS for Windows to perform the analysis. It also highlights the importance of sensitivity analysis in determining the robustness of the results.
from the cost effectiveness analyses. As differences between groups were small (< £50 per patient) and tended to favour the acupuncture group, exclusion of the costs of prescription drugs is a conservative measure that is unlikely to have an important influence on cost effectiveness estimates.

Table 3 reports HRQoL as measured by the SF-6D. We noted an improvement in QALYs over the 12 months in the acupuncture group but not in controls, with the difference between groups reaching significance (P = 0.02). We estimated the mean health gain to be 0.021 QALYs, equivalent to eight quality adjusted days (table 5).

We estimated the mean incremental cost of the acupuncture intervention to the NHS to be £205 per patient, excluding the impact on prescription drugs (table 5). This was offset slightly by a small reduction in direct patient costs (over the counter medication and visits to practitioners of complementary and alternative medicine). Overall this equates to an additional cost of £9180 per QALY gained, including patient costs.

Table 4 Costs in £

<table>
<thead>
<tr>
<th>Cost</th>
<th>Acupuncture arm</th>
<th>Control arm</th>
<th>Difference* Mean (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acupuncture</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acupuncture, study</td>
<td>201.49 (89.62)</td>
<td>3.02 (28.60)</td>
<td>198.97 (185.72 to 212.22)</td>
</tr>
<tr>
<td>Acupuncture, other NHS</td>
<td>17.54 (51.55)</td>
<td>0.14 (1.78)</td>
<td>17.76 (9.65 to 25.86)</td>
</tr>
<tr>
<td>Acupuncture, private</td>
<td>10.68 (46.27)</td>
<td>0.38 (4.79)</td>
<td>10.48 (3.08 to 17.89)</td>
</tr>
<tr>
<td>Other healthcare visits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General practitioner</td>
<td>46.40 (68.48)</td>
<td>71.61 (102.34)</td>
<td>-21.38 (-39.89 to -2.87)</td>
</tr>
<tr>
<td>Outpatient</td>
<td>21.68 (76.49)</td>
<td>12.10 (53.32)</td>
<td>10.24 (-4.15 to 28.63)</td>
</tr>
<tr>
<td>Other, NHS</td>
<td>2.59 (18.80)</td>
<td>6.63 (39.61)</td>
<td>-3.94 (-9.59 to 2.63)</td>
</tr>
<tr>
<td>Other, private</td>
<td>73.15 (262.04)</td>
<td>68.38 (389.97)</td>
<td>-5.00 (-62.61 to 52.61)</td>
</tr>
<tr>
<td>Medication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over the counter drugs</td>
<td>39.07 (60.97)</td>
<td>39.42 (50.67)</td>
<td>0.00 (-11.87 to 11.87)</td>
</tr>
<tr>
<td>Complementary or alternative medication</td>
<td>1.72 (10.00)</td>
<td>5.68 (17.82)</td>
<td>-4.01 (-7.13 to -0.88)</td>
</tr>
<tr>
<td>Prescription drugs†</td>
<td>160.98 (365.77)</td>
<td>211.51 (484.15)</td>
<td>-52.43 (-231.27 to 126.18)</td>
</tr>
</tbody>
</table>

n=sample size; SD=standard deviation; CI=confidence interval.

*Adjusted for baseline variables.
†Subsample only.

Table 5 Cost effectiveness. Values are means (standard deviations) unless otherwise indicated

<table>
<thead>
<tr>
<th></th>
<th>Acupuncture arm</th>
<th>Control arm</th>
<th>Mean difference‡ (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS cost (£)*</td>
<td>289.65 (165.86)</td>
<td>88.65 (136.28)</td>
<td>205.34 (169.33 to 241.35)</td>
</tr>
<tr>
<td>Patient cost (£)</td>
<td>113.75 (258.24)</td>
<td>128.56 (426.56)</td>
<td>-15.01 (-86.24 to 54.42)</td>
</tr>
<tr>
<td>Total cost (£)</td>
<td>403.40 (356.69)</td>
<td>211.21 (486.05)</td>
<td>192.19 (102.34 to 276.51)</td>
</tr>
<tr>
<td>Quality adjusted life years (QALYs)</td>
<td>0.727 (0.119)</td>
<td>0.708 (0.112)</td>
<td>0.021 (0.001 to 0.040)</td>
</tr>
</tbody>
</table>

n=sample size; SD=standard deviation; CI=confidence interval.

*Excluding prescription drug costs.
‡Total cost (£)=NHS cost+patient cost.*Adjusted for baseline variables.

We estimated the mean incremental cost of the acupuncture intervention to the NHS to be £205 per patient, excluding the impact on prescription drugs (table 5). This was offset slightly by a small reduction in direct patient costs (over the counter medication and visits to practitioners of complementary and alternative medicine). Overall this equates to an additional cost of £9180 per QALY gained, including patient costs.

Figures 1 and 2 show the probability that the intervention is cost effective (under our base case assumptions) for a range of cost effectiveness ceilings. At a ceiling of £30 000 per QALY gained (a threshold of cost effectiveness consistent with decisions that have been taken by NICE[16]). the probability that acupuncture is cost effective is 92%. The figures also show how cost effectiveness changes for several different scenarios (details and further scenarios in table 6). Given the relative value of a general practitioner’s time, acupuncture by physiotherapists represents better value for money. Even if a general practitioner can manage to treat four patients in an hour this is still less cost effective than a physiotherapist treating two per hour (the base case scenario).

We saw a marked improvement in cost effectiveness associated with the inclusion of productivity costs. However, this represents an underestimate of the cost per QALY since the quality of life measure will in part reflect this improved productivity, especially with respect to increased leisure time. Estimated
Cost effectiveness was also improved by the projection of effects beyond one year and the assumption that acupuncturists could improve their throughput by dealing with patients simultaneously. Cost effectiveness was not markedly different when we used private acupuncture costs. Similarly, imputing values for cases with missing data did not greatly influence the results, although the explanatory power of the imputation regressions was weak. Under none of the scenarios did the central estimate of cost indicate overall cost savings.

**Discussion**

Acupuncture lead to increases in both QALYs and health service costs. We estimated the incremental cost effectiveness to be £9180 per QALY gained. The estimated improvement in quality of life correlates with the observed reductions in headache severity and frequency.

We consider that the base case is likely to be conservative as it excludes cost savings associated with prescription drugs and productivity gains. More importantly, our base case analysis considers only the 12 months of the trial. The effects of acupuncture appear to be persistent as differences between groups were slightly larger at one year than immediately post-treatment. If we include likely QALY differences for subsequent years, then acupuncture appears even better value for money.

Acupuncture by medical general practitioners (as well as by specialist physiotherapists) appears to be reasonably cost effective compared with usual care, however, given the relative value of a general practitioner's time, acupuncture by physiotherapists represents better value for money, unless general practitioners can achieve substantially better outcomes and or much shorter contact times.

The probability that the programme is cost effective at a ceiling of £30 000 was estimated to be 92% for the base case. This does not take into account the uncertainty owing to imputing missing values, which means that this probability is a slight overestimate. When only complete responders are included in the analysis the probability falls to 84%, but this estimate is biased conservatively. This study, like most economic evaluations, was not powered to detect a difference in cost effectiveness and therefore the lack of statistical significance at the 5% level should not be interpreted as evidence of non-cost effectiveness—few if any economic evaluations attain such levels of significance.

**Table 6** Sensitivity analyses

<table>
<thead>
<tr>
<th>Sample size</th>
<th>Incremental cost (£)</th>
<th>QALYs gained</th>
<th>Incremental cost per QALY gained (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base case (see table 5)</td>
<td>255</td>
<td>189.42</td>
<td>0.021</td>
</tr>
<tr>
<td>Alternative unit costs associated with acupuncture*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using average cost of a private acupuncture session</td>
<td>255</td>
<td>234.72</td>
<td>0.021</td>
</tr>
<tr>
<td>Physiotherapist can treat three patients per hour</td>
<td>255</td>
<td>117.64</td>
<td>0.021</td>
</tr>
<tr>
<td>General practitioner instead of physiotherapist (treatment four patients per hour)</td>
<td>255</td>
<td>254.50</td>
<td>0.021</td>
</tr>
<tr>
<td>Strategy for handling of missing values</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Include only patients completing all questionnaires</td>
<td>220</td>
<td>201.52</td>
<td>0.018</td>
</tr>
<tr>
<td>Imputation of QALYs and costs</td>
<td>401</td>
<td>164.59</td>
<td>0.015</td>
</tr>
<tr>
<td>Inclusion of additional cost component</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Productivity costs (days off sick)</td>
<td>255</td>
<td>67.34</td>
<td>0.021</td>
</tr>
<tr>
<td>Projection of results into the future</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial arms converge by 2 years</td>
<td>255</td>
<td>142.10</td>
<td>0.177</td>
</tr>
<tr>
<td>Trial arms converge by 5 years</td>
<td>255</td>
<td>166.39</td>
<td>0.092</td>
</tr>
<tr>
<td>Trial arms converge by 10 years</td>
<td>255</td>
<td>183.33</td>
<td>0.039</td>
</tr>
</tbody>
</table>

All analyses adjust for baseline variables.

*Assumes same health outcome as the base case.
†Using linear regression to predict missing values from baseline parameters.
Acupuncture is widely used for chronic pain
A number of small trials, and recently a larger more rigorous trial, indicate that acupuncture is of benefit for chronic headache disorders
No rigorous cost effectiveness assessments of acupuncture have been previously undertaken

**What is already known on this topic**

Acupuncture improves health related quality of life (HRQoL), but increases costs to the health service
Cost effectiveness was estimated to be £9180 per QALY gained, or less if analysis incorporated likely QALY differences for the years after the trial
If decision makers are willing to pay up to £30 000 to gain one QALY then acupuncture in the treatment of chronic headache is highly likely to be cost effective

**What this study adds**

To our knowledge, this is the first rigorous economic evaluation of acupuncture. Prior economic studies on acupuncture for pain have typically been conducted by acupuncture advocates and have used questionable methods. For example, studies have claimed cost savings on the basis of hypothetical interventions that would have been necessary had acupuncture not been administered. Other studies have used before-after comparisons or non-randomised controls. Cost savings have been claimed by retrospective studies of acupuncture for other conditions, similar methodological problems have been described.

Our study, with a relatively large sample size, a randomised comparison arm, and prospective evaluation of costs, has not found such overall cost savings for headache patients; we can be fairly certain from our results that acupuncture adds to health service costs for these patients. Therefore the pertinent question is whether this additional cost is justified by the associated health gains. Even when we use our conservative base case estimate of £9180 per QALY gained, acupuncture for migraine seems to be better value for money than several interventions that have been recommended by NICE. To our knowledge, a cost per QALY analysis has only been performed for one other antimigraine intervention—sumatriptan compared with oral caffeine and ergotamine—which had a cost per QALY of £16 000.

Clinicians, commissioners, and patients should consider acupuncture for migraine and chronic headache as it seems to reduce the severity of headache and improves HRQoL at a small additional cost. It is an intervention that is relatively cost effective compared with a number of interventions provided by the NHS.

Contributors: DW undertook the economic analyses and is the study guarantor; AJV conceived and designed the randomised trial and advised on statistical aspects of the economic analyses; RG advised on the analyses; RM contributed to design of resource outcome assessment.
Funding: NHS R&D National Coordinating Centre for Health Technology Assessment (NCCHTA) Grant: 96/40/15.

Competing interests: None declared.

Ethical approval was received from South West Multi-centre Research Ethics Committee and appropriate local ethics committees.

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Comparison of pharmacological treatment versus acupuncture treatment for migraine without aura--analysis of socio-medical parameters.


Source

Istituto Paracelso, Italian Center for Non Conventional Medicines, Rome, Italy.

Abstract

This study was carried out in 120 patients affected by migraine without aura, treated in 4 public health centers and randomly divided into acupuncture group (AG) and conventional drug therapy group (CDTG). The evaluation of clinical results was made 6 and 12 months after the beginning of treatment and was worked out as well according to socio-medical parameters. Acupuncture was applied to the following points: Touwei (ST 8), Xuanlu (GB 5), Fengchi (GB 20), Dazhui (GV 14), Lieque (LU 7), treated with the reducing method. In AG, the figure scoring the entity and frequency of migraine attacks drops from 9,823 before treatment to 1,990 6 months after and 1,590 12 months after; while in CDTG, it drops from 8,405 before treatment to 3,927 6 months after and 3,084 12 months after. In AG, the total absence from work amounted to 1,120 working days/year, with a total cost (private + social costs) of 186,677,000 Italian liras. In CDTG, the absence from work amounted to 1,404 working days/year, with a total cost of 266,614,000 Italian liras. If we consider that in Italy the patients affected by migraine without aura are around 800,000, and that acupuncture therapy is able to save 1,332,000 Italian liras on the total average cost supported for every single patient, the application of acupuncture in the treatment of migraine without aura would allow a saving of the health expenses in Italy of over 1,000 billion liras.
Cost-Effectiveness Analysis of Acupuncture, Counselling and Usual Care in Treating Patients with Depression: The Results of the ACUDep Trial

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Abstract

Background: New evidence on the clinical effectiveness of acupuncture plus usual care (acupuncture) and counselling plus usual care (counselling) for patients with depression suggests the need to investigate the health-related quality of life and costs of these treatments to understand whether they should be considered a good use of limited health resources.

Methods and Findings: The cost-effectiveness analyses are based on the Acupuncture, Counselling or Usual care for Depression (ACUDep) trial results. Statistical analyses demonstrate a difference in mean quality adjusted life years (QALYs) and suggest differences in mean costs which are mainly due to the price of the interventions. Probabilistic sensitivity analysis is used to express decision uncertainty. Acupuncture and counselling are found to have higher mean QALYs and costs than usual care. In the base case analysis acupuncture has an incremental cost-effectiveness ratio (ICER) of £4,560 per additional QALY and is cost-effective with a probability of 0.62 at a cost-effectiveness threshold of £20,000 per QALY. Counselling compared with acupuncture is more effective and more costly with an ICER of £71,757 and a probability of being cost-effective of 0.36. A scenario analysis of counselling versus usual care, excluding acupuncture as a comparator, results in an ICER of £7,935 and a probability of 0.91.

Conclusions: Acupuncture is cost-effective compared with counselling or usual care alone, although the ranking of counselling and acupuncture depends on the relative cost of delivering these interventions. For patients in whom acupuncture is unavailable or perhaps inappropriate, counselling has an ICER less than most cost-
effectiveness thresholds. However, further research is needed to determine the most cost-effective treatment pathways for depressed patients when the full range of available interventions is considered.

Introduction

Depression has the fourth highest burden of disease, and is expected to have the highest in high-income countries by 2030 [1]. In England an estimated 2.6 million cases of depression are reported with an economic burden estimated to exceed £9 billion per annum, with approximately £370 million covering direct costs of treatment [2]. However, up to 33% of patients do not show an adequate response to pharmacological antidepressant treatment, [3] and 30% do not adhere to their medication regime [4].

A number of non-pharmacological high-intensity psychological interventions are available for the treatment of moderate to severe depression, or mild depression with inadequate response. The United Kingdom’s (UK) National Institute for Health and Care Excellence (NICE) clinical guidelines recommend cognitive behavioural therapies (CBT), interpersonal therapy (IPT), behavioural activation (ACT) and behavioural couples therapy [5]. Overall, NICE found the evidence for counselling to be limited, however, counselling is recommended by NICE for patients who have declined antidepressants, CBT, IPT, ACT and behavioural couples therapy. For a person whose depression has not responded to either pharmacological or psychological interventions, the clinical guidelines recommend combining antidepressant medication with CBT, for which evidence suggests that combined CBT/medication is more effective and cost-effective than either treatment alone [5–7]. However, a more recent meta-analysis found that all seven psychotherapeutic interventions examined were more effective than usual care. The only significant difference between interventions was that IPT achieved an improved effect compared with supportive counselling. [8] Counselling is widely used for patients with depression, with 9000 primary care practices in England offering referrals [9] despite its limited recommendation [5].

Acupuncture is provided as a treatment most commonly for chronic pain [10], for which there is evidence of a beneficial effect [11]. Until recently the evidence on the effectiveness of acupuncture for depression has been found to be inconclusive [12], although new evidence of clinical benefits have been recently reported in the ACUDep trial, in which acupuncture and counselling were compared with usual care for patients with on-going depression. [13] Acupuncture is rarely provided within the UK’s mental health service or primary care, but private provision of acupuncture for depression is not uncommon [10].

This study explored the cost-effectiveness of acupuncture plus usual care (acupuncture), counselling plus usual care (counselling) and usual care alone using the health economic findings of the trial: Acupuncture, Counselling or
Usual care for Depression (ACUDep) (ISRCTN63787732). The clinical findings have been reported previously [13]. In the clinical report of the ACUDep trial, patients in both the acupuncture and counselling arms showed improved depression scores on the primary outcome, the Patient Health Questionnaire (PHQ-9) scale[14], compared with usual care alone at 3 and 6 months as well as in an area-under-curve analysis over 12 months. There were no statistically significant differences between the counselling and acupuncture arms.

Given the positive clinical results in the ACUDep trial, the primary aim of this study was to assess the health-related quality of life and resource use reported in the trial to determine the cost-effectiveness of short courses of acupuncture or counselling compared with usual care alone for patients with moderate to severe depression.

Methods

Trial

ACUDep was an open parallel-arm randomised controlled trial with patients randomised to one of three arms using the allocation ratio of 2:2:1, respectively: 12 weekly sessions of acupuncture; 12 weekly sessions of counselling; and usual care alone. The pragmatic design meant patients were not restricted from receiving interventions associated with the trial groups in which they were not randomised or other types of psychological interventions. Patients were eligible if they were 18 or over, had consulted with depression in primary care within the past 5 years and who were continuing to experience moderate to severe depression based on a score of at least 20 on the Beck Depression Inventory (BDI-II) [15].

Further eligibility criteria have been described elsewhere [13, 16].

Health Outcomes

The measure of health benefit used in the economic analysis was the quality adjusted life year (QALY), which takes into account the treatment differences in health-related quality of life (HRQoL) and mortality. HRQoL was measured using the EuroQol (EQ-5D) instrument, at baseline, and at months 3, 6, 9 and 12 in ACUDep. The EQ-5D measures health-related quality of life on five dimensions (mobility, self-care, usual activities, pain/discomfort and anxiety and depression). Each dimension is subdivided into three levels which corresponded to whether a respondent has no problems, moderate problems or extreme problems (Table S1: EQ-5D Level Descriptions). The value of each of the 243 unique health states is preference weighted using valuations from a UK population [17]. The EQ-5D is preferred by NICE for assessing cost-effectiveness [18].

Costs

A National Health Service (NHS) cost perspective was used, although out-of-pocket expenses were also reported.
Resource use data were collected at 3, 6, 9 and 12 months using patient questionnaires in the trial. Patients were asked how many times they visited different health care providers over the last 3 months for “any reason” (i.e. the total number of visits to a provider) and “about your depression only” (i.e. depression related visits). Total annual resource use was calculated as the sum of the resource use collected at each 3-month period. The total annual cost was calculated by multiplying the total annual resource use by publicly available 2012 national unit costs (Table S2: Unit Costs). As the cost of acupuncture is not currently financed by the NHS, we used the costs of acupuncture as estimated previously and the average of the ranges reported by NHS Choices, £47.50, for an initial session and £37.50 for subsequent sessions [19, 20]. The costs of counselling are those currently used in the NHS, £65 per hour of client contact [21]. Total annual costs were missing for many patients, due to missing resource use data at one or more follow-up periods.

**Statistical Analysis**

Multiple imputation methods were used to manage the uncertainty caused by the missing data. Chained imputation using predictive mean matching was undertaken using resource use data, PHQ-9 and BDI scores, QALYs, and patient characteristics such as age, sex and education.

EQ-5D data were analysed using ordered logit models on each of the five dimensions of the instrument. Analysis at 3 months controlled for the baseline response and analysis over 12 months used random effects models and controlled for the baseline response and the timing of each response (i.e. the day from randomization).

HRQoL weights were calculated using an independent predefined algorithm obtained by the elicitation of societal preferences for EQ-5D health states in a random population sample through a time trade-off technique. The UK valuation of the EQ-5D results in a scale from −0.594 to 1, where negative numbers represent states worse than death, 0 represents death and 1 represents perfect health [17]. QALYs were calculated by applying an individual’s HRQoL weights and the time between EQ-5D measures using the area under the curve approach [22, 23]. For all cost-effectiveness analyses seemingly unrelated regressions were used to account for the correlation between costs and QALYs [24]. QALYs were regressed on the base line HRQoL and treatment arm, and costs were regressed on the treatment arm only.

Incremental cost-effectiveness ratios (ICERs) were estimated using fully incremental analysis. We did not consider pairwise comparisons appropriate given the economic requirement to include all relevant comparators and because pairwise comparisons may lead to misleading conclusions, for example, if ICERs are calculated between treatments when one of the treatments is dominated by a third treatment not included in the calculation.
Sensitivity Analysis

Base case results were calculated using total costs and taking into account the uncertainty from the multiple imputation and the seemingly unrelated regression. Probabilistic sensitivity analysis was used to reflect uncertainty in mean total costs and QALYs and we estimated the probability of cost-effectiveness conditional on alternative cost-effectiveness thresholds. Further exploratory scenario analyses were undertaken to understand the influence on cost-effectiveness of (i) the differential cost of the acupuncture and counselling interventions, (ii) depression related resource use (i.e. those visits determined by the patient to be related only to depression), (iii) complete case and (iv) a population for which acupuncture is not appropriate or unavailable (e.g. those with needle phobia).

Cost-effectiveness thresholds

All analyses considered the published NICE cost-effectiveness thresholds of £20,000 and £30,000 per QALY gained [18]. Additionally, we considered a recent empirically estimated NICE threshold of £13,000 per QALY [25]. These thresholds are meant to represent the opportunity costs of the NHS. Thus, ICERs below the threshold suggest that the intervention is a good use of NHS resources, while ICERs above the threshold provide less health than they displace.

Results

Health Outcomes

At 3 months patients treated with acupuncture or counselling were less likely than patients treated with usual care to report that they were moderately or extremely anxious or depressed rather than not anxious or depressed (Table 1). The 3-month improvement in anxiety and depression was sustained over the trial period to 12 months (Figure S1: Responses to the anxiety and depression dimension of the EQ-5D over 12 months and by treatment). At 3 months the direction of effect for the other EQ-5D dimensions is mixed; however, over the 12 months, the odds of being in the worse health states for all dimensions was lower for the acupuncture and counselling arms compared with usual care (Table 1).

Combining the EQ-5D dimension results with the UK population health state preferences resulted in the HRQoL scores over time and by treatment presented in Figure 1. For all treatment arms the HRQoL increased between baseline and 3 months with acupuncture and counselling arms being higher than usual care and remaining higher at 12 months.

QALYs for usual care, acupuncture and counselling were estimated to be 0.604, 0.663 and 0.666, respectively, using imputed data and seemingly unrelated regression controlling for the baseline HRQoL.
Costs

Mean NHS resource use was highest for patients in the usual care group (Table 2). The sample of patients reporting resource use was small, but complete case results were similar to the imputed results. Total costs and depression related costs were reported in Table 3. As expected depression related costs were lower than the total costs. The higher resource use in the usual care group was offset by the additional costs of acupuncture and counselling sessions. Costs were lowest for patients in

*Levels 1–3 represent low, moderate and high disability respectively. For more detailed information on EQ-5D levels see Table S1.

The odds ratios below 1 indicate that the treatment was correlated with fewer patients reporting being in the more severe health states than patients in the usual care arm, i.e. the OR 0.63 in column 2 suggests that patients in the acupuncture arm were less likely to report being moderately or extremely anxious or depressed than patients in the usual care arm at 3 months. The odds ratios above 1 suggest that the treatment is correlated with more patients reporting being in the more severe health states than patients in the usual care arm.

Cost-Effectiveness Results from the ACUDep Trial

**Table 1.** The proportional odds of being at level 2 or 3 compared with level 1* compared with usual care.

<table>
<thead>
<tr>
<th>EQ-5D Dimension</th>
<th>At 3 Months</th>
<th>Over 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acupuncture OR (95%CI)</td>
<td>Counselling OR (95%CI)</td>
</tr>
<tr>
<td>Anxiety and Depression</td>
<td>0.63 (0.40 to 0.98)</td>
<td>0.66 (0.42 to 1.02)</td>
</tr>
<tr>
<td>Pain</td>
<td>0.77 (0.48 to 1.23)</td>
<td>0.96 (0.60 to 1.53)</td>
</tr>
<tr>
<td>Usual Activities</td>
<td>1.14 (0.48 to 2.71)</td>
<td>1.05 (0.44 to 2.54)</td>
</tr>
<tr>
<td>Self-care</td>
<td>0.81 (0.52 to 1.27)</td>
<td>0.85 (0.54 to 1.33)</td>
</tr>
<tr>
<td>Mobility</td>
<td>1.29 (0.64 to 2.61)</td>
<td>1.19 (0.59 to 2.41)</td>
</tr>
</tbody>
</table>

The proportional odds of being at level 2 or 3 compared with level 1* compared with usual care.

**Figure 1.** Health-related quality-of-life scores over time and by treatment.

**Figure 1.** Health-related quality-of-life scores over time and by treatment.

**Figure 1.** Health-related quality-of-life scores over time and by treatment.
the usual care group and highest for patients in the counselling group. Differences between treatment arms were similar whether total or depression costs were used.

Patients reported the amount spent on out-of-pocket acupuncture, counselling or therapy. Table 4 displays the means and standard deviations (SD) of out-of-pocket expenditures and days off work. Patients in the acupuncture arm reported spending the most on acupuncture while patients in the counselling arm reported spending the most on counselling and psychotherapy. The reported means for the number of days off work were similar across arms.
Cost-effectiveness

When comparing acupuncture, counselling and usual care, acupuncture was found to be the cost-effective alternative with an incremental cost-effectiveness ratio of £4,560 per additional QALY compared with usual care alone with probabilities of being cost-effective of 0.68, 0.62 and 0.56 at thresholds of £13,000, £20,000 and £30,000 per QALY, respectively (Table 5). Counselling results in higher costs and benefits than acupuncture with an ICER of £71,757 per additional QALY compared with acupuncture.

A scenario analysis assuming each session of acupuncture is the same price as counselling (£65) resulted in counselling having higher QALYs and lower costs than acupuncture i.e. acupuncture was dominated (Table 6). Cost-effectiveness results were similar between the base case result using total costs and the scenario analysis using depression related costs only. Restricting the analysis to the complete case data resulted in an ICER for acupuncture of £10,979 per QALY and counselling having higher costs and lower QALYs than acupuncture. For patients in whom acupuncture is inappropriate or unavailable the incremental cost-effectiveness of counselling versus usual care was £7,935 per additional QALY.

Discussion

The clinical results of the ACUDep trial demonstrated that acupuncture and counselling significantly reduced depression measures at 3 and 6 months when

### Table 3. Complete case and imputed costs over 12 months.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Usual Care</th>
<th>Acupuncture</th>
<th>Counselling</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>22</td>
<td>69</td>
<td>59</td>
</tr>
<tr>
<td>Complete case mean (95%CI)</td>
<td>958 (365 to 877)</td>
<td>1,110 (930 to 1291)</td>
<td>769 (1082 to 1627)</td>
</tr>
<tr>
<td>Imputed mean (95%CI)</td>
<td>69 (739 to 1180)</td>
<td>1,227 (1103 to 1350)</td>
<td>913 (1305 to 1592)</td>
</tr>
<tr>
<td>Depression related costs</td>
<td>18</td>
<td>54</td>
<td>48</td>
</tr>
<tr>
<td>Total costs (£)</td>
<td>621 (92 to 360)</td>
<td>1,110 (644 to 949)</td>
<td>769 (759 to 1166)</td>
</tr>
<tr>
<td>(95%CI)</td>
<td>958 (288 to 704)</td>
<td>1,227 (764 to 1061)</td>
<td>913 (761 to 1251)</td>
</tr>
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</tbody>
</table>

**Cost-effectiveness**

When comparing acupuncture, counselling and usual care, acupuncture was found to be the cost-effective alternative with an incremental cost-effectiveness ratio of £4,560 per additional QALY compared with usual care alone with probabilities of being cost-effective of 0.68, 0.62 and 0.56 at thresholds of £13,000, £20,000 and £30,000 per QALY, respectively (Table 5). Counselling results in higher costs and benefits than acupuncture with an ICER of £71,757 per additional QALY compared with acupuncture.

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**Discussion**

The clinical results of the ACUDep trial demonstrated that acupuncture and counselling significantly reduced depression measures at 3 and 6 months when

**Table 4. Out-of-pocket costs and days of work for complete cases.**

<table>
<thead>
<tr>
<th>Resource</th>
<th>Out-of-pocket acupuncture costs (SD)</th>
<th>Out-of-pocket counselling costs (SD)</th>
<th>Out-of pocket psychotherapy costs (SD)</th>
<th>Days off work (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usual Care</td>
<td>£6 (57)</td>
<td>£5 (32)</td>
<td>£3 (23)</td>
<td>231 (113)</td>
</tr>
<tr>
<td>n=98</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acupuncture</td>
<td>£32 (93)</td>
<td>£6 (42)</td>
<td>£2 (33)</td>
<td>238 (115)</td>
</tr>
<tr>
<td>n=194</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counselling</td>
<td>£7 (41)</td>
<td>£42 (173)</td>
<td>£15 (87)</td>
<td>240 (112)</td>
</tr>
<tr>
<td>n=169</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
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**Table 3. Complete case and imputed costs over 12 months.**

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<td>Depression related costs (£)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 4. Out-of-pocket costs and days of work for complete cases.**

<table>
<thead>
<tr>
<th>Resource</th>
<th>Out-of-pocket acupuncture costs (SD)</th>
<th>Out-of-pocket counselling costs (SD)</th>
<th>Out-of pocket psychotherapy costs (SD)</th>
<th>Days off work (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usual Care</td>
<td>£6 (57)</td>
<td>£5 (32)</td>
<td>£3 (23)</td>
<td>231 (113)</td>
</tr>
<tr>
<td>n=98</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acupuncture</td>
<td>£32 (93)</td>
<td>£6 (42)</td>
<td>£2 (33)</td>
<td>238 (115)</td>
</tr>
<tr>
<td>n=194</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counselling</td>
<td>£7 (41)</td>
<td>£42 (173)</td>
<td>£15 (87)</td>
<td>240 (112)</td>
</tr>
<tr>
<td>n=169</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
compared with usual care, as well as in an area-under-curve analysis over the 12-month period [13]. No statistically significant differences in clinical outcome between acupuncture and counselling were detected. This economic analysis demonstrated that the HRQoL results are consistent with the previously reported clinical results. NHS resource use was highest in the usual care group, but costs were highest in the counselling group followed by the acupuncture group because of the cost of the interventions.

The trial was powered based on the primary outcome of PHQ-9 and not the outcomes used in this analysis, EQ-5D and resource use. It is not surprising that the differences were not statistically significant at the standard p-values. Furthermore, inferential statistics are not helpful in making decisions about allocation of resources [26]. This study used probabilistic sensitivity analysis to

### Table 5. Incremental cost-effectiveness of Usual Care, Acupuncture and Counselling.

<table>
<thead>
<tr>
<th></th>
<th>QALY</th>
<th>Total costs (£)</th>
<th>ICER (£ per QALY)</th>
<th>Probability of Cost-Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Threshold = £13,000 per QALY</td>
</tr>
<tr>
<td>Usual Care</td>
<td>0.604</td>
<td>958</td>
<td>–</td>
<td>0.07</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>0.663</td>
<td>1,227</td>
<td>4,560</td>
<td>0.68</td>
</tr>
<tr>
<td>Counselling</td>
<td>0.666</td>
<td>1,450</td>
<td>71,757</td>
<td>0.26</td>
</tr>
</tbody>
</table>

doi:10.1371/journal.pone.0113726.t005

### Table 6. Incremental cost-effectiveness scenario analyses.

i) Assuming acupuncture has the same cost as counselling (£65)

<table>
<thead>
<tr>
<th></th>
<th>QALY</th>
<th>Total costs (£)</th>
<th>ICER (£ per QALY)</th>
<th>Probability of Cost-Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Threshold = £13,000 per QALY</td>
</tr>
<tr>
<td>Usual Care</td>
<td>0.558</td>
<td>524</td>
<td>–</td>
<td>0.15</td>
</tr>
<tr>
<td>Counselling</td>
<td>0.620</td>
<td>1,050</td>
<td>8,497</td>
<td>0.50</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>0.617</td>
<td>1,073</td>
<td>Dominated</td>
<td>0.35</td>
</tr>
</tbody>
</table>

ii) Using depression related costs

<table>
<thead>
<tr>
<th></th>
<th>QALY</th>
<th>Total costs (£)</th>
<th>ICER (£ per QALY)</th>
<th>Probability of Cost-Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Threshold = £13,000 per QALY</td>
</tr>
<tr>
<td>Usual Care</td>
<td>0.601</td>
<td>513</td>
<td>–</td>
<td>0.08</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>0.659</td>
<td>853</td>
<td>5,819</td>
<td>0.61</td>
</tr>
<tr>
<td>Counselling</td>
<td>0.663</td>
<td>1025</td>
<td>50,612</td>
<td>0.32</td>
</tr>
</tbody>
</table>

iii) Complete case analysis

<table>
<thead>
<tr>
<th></th>
<th>QALY</th>
<th>Total costs (£)</th>
<th>ICER (£ per QALY)</th>
<th>Probability of Cost-Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Threshold = £13,000 per QALY</td>
</tr>
<tr>
<td>Usual Care</td>
<td>0.638</td>
<td>648</td>
<td>–</td>
<td>0.43</td>
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<tr>
<td>Acupuncture</td>
<td>0.682</td>
<td>1,121</td>
<td>10,979</td>
<td>0.57</td>
</tr>
<tr>
<td>Counselling</td>
<td>0.643</td>
<td>1,378</td>
<td>Dominated</td>
<td>0.01</td>
</tr>
</tbody>
</table>

iv) Population for which acupuncture is not appropriate

<table>
<thead>
<tr>
<th></th>
<th>QALY</th>
<th>Total costs (£)</th>
<th>ICER (£ per QALY)</th>
<th>Probability of Cost-Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Threshold = £13,000 per QALY</td>
</tr>
<tr>
<td>Usual Care</td>
<td>0.604</td>
<td>958</td>
<td>–</td>
<td>0.21</td>
</tr>
<tr>
<td>Counselling</td>
<td>0.666</td>
<td>1,450</td>
<td>7,935</td>
<td>0.79</td>
</tr>
</tbody>
</table>

*Some of the differences with the base case results (Table 4) are because of the probabilistic nature of the calculations.

doi:10.1371/journal.pone.0113726.t006
incorporate the consequences of the variation in the trial results rather than using an arbitrary cut-off.

The cost-effectiveness results, taking into account the uncertainty in the estimates, suggest that acupuncture is the cost-effective option. Currently acupuncture for depression is not provided by the NHS. It is possible that the regulation of acupuncture may increase the per session costs. A sensitivity analysis was undertaken assuming that each acupuncture session costs £65, the same as counselling. In this scenario counselling is preferred to acupuncture because not only are the expected benefits higher but the expected costs are lower. This demonstrates that the cost-effectiveness of acupuncture in this study is reliant on having a lower price than counselling.

An analysis was undertaken comparing counselling to usual care alone to estimate the cost-effectiveness in patients for whom acupuncture is inappropriate. The trial was undertaken in a patient population able to undertake acupuncture thus this analysis assumes that costs and outcomes for counselling and the usual care alone arms in the trial will be the same for patients for whom acupuncture is not appropriate.

A cost-effectiveness analysis should consider the life-time horizon. In this trial patients were treated for up to 12 weekly sessions, although one patient in the counselling arm received 15 sessions, and patients outcomes were followed up for 12 months. The cost-effectiveness analysis considered a 12-month timeframe. This assumes that there are no differences in treatment arms past 12 months. This is expected to be a conservative assumption as there are expected to be no further intervention costs, but trial results suggest continued treatment differences at 12 months, although these treatment differences seem to be converging (Figure 1). Extrapolating these differences beyond 12 months would result in a lower ICER of acupuncture and no change to the conclusion.

When considering the possibility of incorporating further evidence into the analyses, only one previous trial of 59 patients with depression has been undertaken in the UK [27]. Patients received 12 sessions of acupuncture or sham acupuncture and outcomes were measured on the Beck Depression Index (BDI). The results of this trial were not included in this analysis due to the difference in the outcome used, the difference in comparator, the absence of health economic related data and the small number of patients included. Regarding counselling we found no trial based in primary care that evaluated counselling for moderate to severe depression.

Not all possible treatments for moderate to severe depression have been included in this analysis. Recent cost-effectiveness analyses on online cognitive behavioural therapy (CBT) report its cost-effectiveness versus usual care [5–7]. These analyses were based on the BDI rather than EQ-5D or PHQ-9, making comparisons with the current analysis difficult. It is also expected that some patients in the ACUDep trial may have received CBT as a part of usual care making the control group in this analysis different from previous trials. This study demonstrates that acupuncture is cost-effective compared with usual care alone given current levels and mixes of usual care but does not consider the alternative
of improving usual care. Further analyses are needed to determine the cost-effectiveness of acupuncture and counselling when compared with other physical and psychological interventions as well as changing levels of usual care to understand how to best allocate scarce health care resources.

**Conclusion**

The results of this analysis suggest acupuncture is cost-effective compared with counselling or usual care alone. This result is strongly influenced by the cost of acupuncture which only remains cost-effective when the cost of providing the intervention is lower than that of counselling. For patients in whom acupuncture is unavailable and perhaps inappropriate, counselling has an ICER less than a range of estimates of NICE’s cost-effective threshold. However, further research is needed to determine the most cost-effective treatment pathways for depressed patients when the full range of available interventions is considered.

**Supporting Information**

Figure S1. Responses to the anxiety and depression dimension of the EQ-5D over 12 months and by treatment.
doi:10.1371/journal.pone.0113726.s001 (TIF)

Table S1. EQ-5d Level Descriptions.
doi:10.1371/journal.pone.0113726.s002 (DOCX)

Table S2. Unit Costs.
doi:10.1371/journal.pone.0113726.s003 (DOCX)

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**Author Contributions**

Conceived and designed the experiments: HM SR MB MS DT IW. Analyzed the data: ES MB RG AK. Wrote the paper: ES SR MS MB SB RG AH AK HL SP DT IW HM.

**References**
