



Title	Acupuncture transmitted infections.
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smoking, poor nutrition, and excessive alcohol use—are at least quantifiable, so it is easier to study the effects of specific interventions.⁵

Physical inactivity can be measured using a pedometer, which can be provided to each employee with encouragement to walk for 30 minutes every day. Smoking can be measured by cotinine concentrations and banned on premises, and there could be a ban on hiring smokers (allowable in 39 US states). Unhealthy eating and obesity can be monitored through body mass index, waist size, and portion sizes. People can be advised to eat five servings of fruits and vegetables a day, and the organisation can help them do this by making healthy food available and unhealthy food less so. Alcohol intake can be quantified.

Evidence shows that programmes to manage stress in the workplace have beneficial effects. Much of the best work in this field comes from Japan, where workplace stress is high—more than 60% of Japanese workers report high levels of anxiety and stress.⁶ Two recent randomised controlled trials showed that single session educational programmes for supervisors, compared with no programme, can significantly improve knowledge,⁷ reduce psychological distress in workers, and improve job performance.^{6,8} One programme that taught stress management in hospitals decreased the frequency of malpractice claims (arguably a proxy in the United States for preventable medical errors) in 22 hospitals by 71% compared with a 3% decrease in hospitals without a stress management programme.⁹ Such a programme also decreased physician (and nurse) burnout and improved physician (and nurse) satisfaction with work.^{10,11}

The NICE guidance implies that the difficulty in measuring stress should not deter organisations from trying to reduce it. Organisations will be more successful if employees help their workers to manage stress.⁹

The science of reducing stress in the workplace is in its infancy, and completing the circle from business policies to improved clinical outcomes is far away. In the meantime, the NICE guidelines can provide some basic advice for businesses wishing to make an impact on productivity and their employees' health.

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Acupuncture transmitted infections

Are underdiagnosed, so clinicians should have a high index of suspicion

Acupuncture, which is based on the theory that inserting and manipulating fine needles at specific acupuncture points located in a network of meridians will promote the harmonious flow of “Qi,” is one of the most widely practised modalities of alternative medicine. Because needles are inserted up to several centimetres beneath the skin, acupuncture may pose risks to patients. One of the most important complications is transmission of pathogenic micro-organisms, from environment to patient or from one patient to another.

In the 1970s and 1980s most infections associated with acupuncture were sporadic cases involving pyogenic bacteria.¹ So far, more than 50 cases have been described globally. In most cases, pyogenic bacteria were transmitted

from the patient's skin flora or the environment because of inadequate skin disinfection before acupuncture. In localised infections, meridian specific and acupuncture point specific lesions were typical. About 70% of patients had musculoskeletal or skin infections, usually in the form of abscesses or septic arthritis, corresponding to the site of insertion of the acupuncture needles.^{1,2} A minority had infective endocarditis, meningitis, endophthalmitis, cervical spondylitis, retroperitoneal abscess, intra-abdominal abscess, or thoracic empyema.^{3,4}

As in other musculoskeletal or skin infections, *Staphylococcus aureus* was the most common bacterium responsible, accounting for more than half of the reported cases.^{1,2} Although most patients recovered, 5-10% died

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Response on bmj.com “This kind of article could easily create an unhealthy scare in the public against acupuncture when there is minimal evidence here that current practices are actually problematic. The authors mostly talk about spread of infection in a setting that no longer exists. Every acupuncturist in the United States is bound by clean needle standards to single use, sterile needles.” Steven Mavros, president, Association for Professional Acupuncture, PA, USA
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of the infections and at least another 10% had serious consequences such as joint destruction, paraplegia, necrotising fasciitis, and multiorgan failure.^{1,2}

Apart from pyogenic bacterial infections, five outbreaks of hepatitis B virus infection associated with acupuncture, which affected more than 80 patients, have been described globally since the 1970s.^{5,6} In most outbreaks the sources were infected patients, and the virus was transmitted from one patient to another through improperly sterilised or unsterilised reusable acupuncture needles, but in one outbreak an acupuncturist who was positive for hepatitis B surface antigen and hepatitis B e antigen was thought to be the source.^{5,6}

The other two major bloodborne viruses, hepatitis C virus and HIV, could hypothetically be transmitted by acupuncture. Most evidence for the association of hepatitis C virus infection with acupuncture came from epidemiological and case-control studies, where acupuncture was found to be an independent risk factor for hepatitis C virus infections.⁷ Although no clear evidence exists to support a link between acupuncture and HIV infection, there are reports of patients with HIV who had no risk factors other than acupuncture.⁸

A new clinical syndrome has emerged in the 21st century—acupuncture mycobacteriosis—which is mainly caused by rapidly growing mycobacteria.⁹ These mycobacteria are thought to be transmitted from the environment to patients via contaminated equipment used in acupuncture, such as cottonwool swabs, towels, hot pack covers, and boiling tanks. All mycobacterial infections associated with acupuncture so far have been characterised by localised meridian specific and acupuncture point specific lesions without dissemination.^{9,10} The lesions usually first appear as erythematous papules and nodules

that subsequently develop into large pustules, abscesses, and ulcerative lesions after several weeks to months. Patients tended to delay seeking medical advice because of the slowly developing and relatively mild symptoms. Owing to the relatively hardy nature of mycobacteria,¹⁰ the long incubation period of the infection, and the difficulty in making a diagnosis, mycobacteria have caused two large outbreaks associated with acupuncture, which affected more than 70 patients.^{11,12}

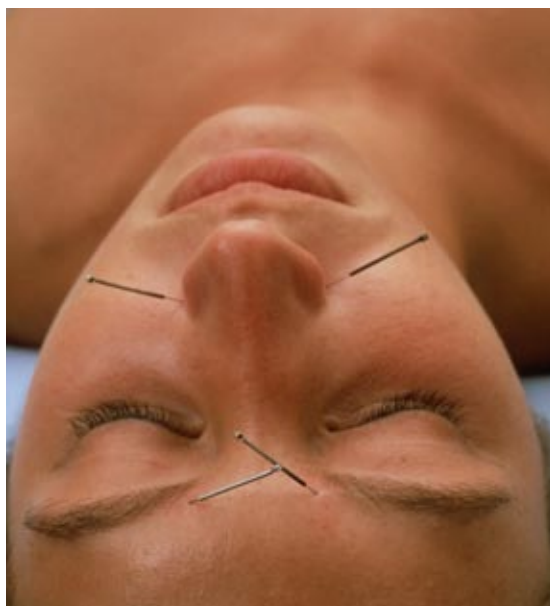
The case reports and outbreaks of acupuncture transmitted infections may be the tip of the iceberg. The first reports of methicillin resistant *S aureus* (MRSA) transmitted by acupuncture appeared in 2009.³ The emergence of community associated MRSA infections may aggravate the problem. To prevent infections transmitted by acupuncture, infection control measures should be implemented, such as use of disposable needles, skin disinfection procedures, and aseptic techniques. Stricter regulation and accreditation requirements are also needed.

Clinicians should also have a high index of suspicion, particularly for viral and mycobacterial infections transmitted by acupuncture because of their prolonged incubation periods, and they should alert health authorities about clusters of cases.

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