

# Acupuncture Side Effects: Risks and Adverse Events

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## Introduction to Adverse Events in Acupuncture

Acupuncture, originating in traditional Chinese medicine, is widely utilized globally as a complementary and alternative therapy for managing various conditions, including chronic pain, nausea, and psychological disorders. Despite its perception as a minimally invasive and generally safe procedure, it is crucial for both practitioners and patients to maintain a comprehensive understanding of the potential adverse events (AEs) associated with its application. While the vast majority of treatments proceed without complication, the systematic documentation and analysis of adverse reactions are essential components of maintaining clinical safety standards and ensuring ethical practice. This entry examines the spectrum of reported AEs, ranging from benign, transient discomfort to extremely rare but potentially life-threatening complications, emphasizing the need for rigorous adherence to sterilization protocols and proper needling techniques to minimize risk. Furthermore, the definition of an AE in this context often extends beyond direct physical injury, encompassing unexpected exacerbation of symptoms or psychological distress related to the treatment experience itself, requiring a holistic view of patient safety.

The global increase in acupuncture utilization necessitates a formalized approach to tracking and reporting safety data, often relying on passive surveillance systems, clinical trials, and mandatory reporting databases. Defining an adverse event in the context of acupuncture presents unique challenges, as minor side effects, such as temporary localized bleeding or bruising, are frequently anticipated and generally accepted by patients. However, an adverse event is typically defined as any undesirable experience associated with the use of a medical product or procedure in a patient, regardless of causality. Differentiating between expected minor reactions and true adverse events is paramount for accurate epidemiological assessment. The literature consistently suggests that when performed by trained professionals using sterile, single-use needles, the overall incidence of serious adverse events remains exceptionally low, positioning acupuncture favorably against many pharmacological interventions in terms of safety profile, yet the absolute risks, however small, cannot be ignored in clinical practice.

Understanding the mechanisms underlying adverse events is critical for prevention. Many complications arise not from the inherent nature of stimulating specific acupoints but rather from procedural errors, including improper depth or angle of insertion, failure to maintain asepsis, or pre-existing patient vulnerabilities. For instance, in patients with known clotting disorders or those taking anticoagulant medications, the risk of hematoma formation is significantly elevated. Therefore, a thorough initial patient assessment, including a detailed medical history and identification of contraindications, forms the foundational layer of risk mitigation. The discussion that follows will systematically categorize these events based on their severity and underlying etiology, providing a framework for understanding the necessary precautions required to maintain the high safety standards expected in modern complementary medicine environments.

## Classification and Incidence of Adverse Events

Adverse events related to acupuncture are typically classified based on their severity, ranging from minor, self-limiting reactions to major, serious events requiring immediate medical intervention or hospitalization. Minor AEs, sometimes referred to as mild side effects, include pain upon needle insertion, localized erythema, slight bleeding, minor bruising (hematoma), or temporary dizziness (vasovagal reactions). These events are extremely common, with incidence rates reported in large-scale studies often exceeding 10% of treatments, though they rarely result in treatment cessation or require follow-up care. Conversely, serious adverse events (SAEs) are defined as outcomes that lead to death, are life-threatening, require inpatient hospitalization, result in persistent or significant disability/incapacity, or are considered medically significant by the treating physician. Accurate determination of the overall incidence of SAEs is challenging due to underreporting, but estimates from meta-analyses suggest that the rate is exceedingly low, often cited as fewer than one per 10,000 to 20,000 treatment sessions, highlighting the overall safety of the procedure when standardized protocols are followed.

Epidemiological studies often employ different methodologies--ranging from prospective observational studies to retrospective reviews of malpractice claims--which contributes to variability in reported incidence rates. Prospective studies, which actively monitor patients for AEs, generally report higher rates of minor events because patients are prompted to report even the slightest discomfort. Conversely, retrospective analyses of hospital records or insurance data tend to capture only the most severe outcomes, leading to lower SAE rates. It is important to note that the training and regulatory environment of the practitioner significantly influence the reported safety profile; studies conducted in settings where acupuncture is performed by licensed physicians or highly regulated practitioners consistently demonstrate lower rates of serious complications compared to those performed by less regulated or minimally trained individuals. The distinction between events directly caused by the needle insertion (e.g., pneumothorax) and those indirectly related (e.g., allergic reaction to the needle material or preparation swab) is also crucial for accurate classification and effective preventive measures.

Furthermore, the concept of "needling shock" or vasovagal syncope represents a relatively common, though usually transient, adverse reaction that often bridges the gap between minor and moderate severity. This reaction is characterized by sudden dizziness, nausea, cold sweats, and sometimes loss of consciousness, typically triggered by anxiety, hunger, or pain, rather than direct tissue damage. While generally not dangerous if the patient is quickly laid down, the potential for secondary injury (e.g., head trauma from falling) means it must be treated seriously. Practitioners are advised to take preventative steps, such as ensuring the patient is well-fed, comfortable, and lying down, especially during the first treatment session or when needling sensitive areas. Understanding these classifications allows researchers and regulatory bodies to prioritize interventions aimed at reducing the most significant risks while acknowledging the inevitability of

minor, temporary reactions inherent to the procedure.

## Common and Minor Adverse Reactions

The most frequently encountered adverse events in acupuncture practice are localized, self-limiting, and generally resolve within hours or days without intervention. These minor reactions are often procedural in nature and directly related to the physical insertion and manipulation of the filiform needle. **Localized pain** at the insertion site is the most common complaint, though the intensity varies greatly depending on the point location, the depth of insertion, and the sensitivity of the patient. This pain is usually described as a brief, sharp sensation upon skin penetration, followed by the characteristic dull, aching, or distending feeling known as *de qi*, which is often sought for therapeutic efficacy but can occasionally be perceived as uncomfortable or painful by the patient.

Another highly frequent minor event is the occurrence of **subcutaneous hemorrhage**, manifesting as minor bleeding immediately upon needle withdrawal or the subsequent development of a small hematoma (bruise). These events are more likely in areas with high vascularity or in patients with compromised clotting ability. Although generally considered harmless, large or deep hematomas can cause prolonged discomfort and temporary discoloration, requiring patient education regarding expected recovery time. Practitioners minimize this risk by using finer gauge needles, avoiding visible superficial veins, and applying firm pressure immediately after needle removal. Furthermore, localized redness (erythema) or temporary minor swelling around the needle site may occur due to histamine release or localized microtrauma, representing a benign inflammatory response that quickly subsides.

Systemic minor reactions, while less common than localized ones, predominantly involve transient neurological or autonomic symptoms. **Dizziness**, lightheadedness, or mild nausea are frequently reported, particularly in patients who are anxious, fatigued, or treated in an upright position. These symptoms are hallmarks of a mild vasovagal response, a reflex characterized by a drop in heart rate and blood pressure. Proper patient positioning, particularly the supine position, and reassuring communication are highly effective preventative strategies. In rare instances, patients may report temporary muscle twitching or slight cramping near the insertion site, which is usually related to direct stimulation of a motor point or nerve fascicle, and typically resolves immediately upon slight withdrawal or manipulation of the needle.

## Serious and Systemic Adverse Events

While rare, serious adverse events (SAEs) represent the most significant safety concern in acupuncture and necessitate meticulous preventative techniques and immediate access to emergency protocols. The most critical and frequently cited SAE is **pneumothorax**, the collapse of

a lung due to air leakage into the space between the lung and chest wall. This occurs when a needle is inserted too deeply or at an incorrect angle into the thoracic cavity, puncturing the parietal or visceral pleura. Points located near the apex of the lung, such as those on the upper back (e.g., Bladder 12, 13) or supraclavicular regions, carry the highest risk. The severity of a pneumothorax depends on the volume of air leaked; small punctures may be asymptomatic and resolve spontaneously, while large or tension pneumothoraces are life-threatening medical emergencies requiring immediate chest decompression and hospitalization. Prevention relies entirely on the practitioner's detailed anatomical knowledge and the strict adherence to safe needling depths and angles, particularly avoiding perpendicular insertion in the thoracic and upper back regions.

Another category of serious events involves injury to major organs or structures in the abdominal or pelvic cavities. While less common than pneumothorax, needling deep abdominal points carries a theoretical risk of puncturing the liver, spleen, or intestines, especially in patients with organomegaly (enlarged organs) or severe obesity where anatomical landmarks may be obscured. **Solid organ injury**, particularly hepatic or splenic rupture, can lead to severe internal bleeding and shock. Similarly, needling points in the lumbar region, if excessively deep, may risk retroperitoneal hemorrhage or damage to the kidneys. The risk is significantly amplified if the patient moves suddenly or if the practitioner utilizes extreme manipulation techniques. Therefore, careful palpation, determination of individual safe depths, and caution when treating patients with acute abdominal conditions or pregnancy are mandatory risk reduction strategies.

Furthermore, serious cardiovascular events, though rarely directly caused by acupuncture, can occasionally be triggered in susceptible individuals. Severe vasovagal syncope leading to prolonged hypotension or bradycardia, while usually manageable, can be problematic in patients with pre-existing heart conditions. There are also extremely rare reports of cardiac tamponade resulting from needling points directly over the heart muscle, though these are typically associated with profound procedural error or highly unusual patient anatomy. The overall safety analysis must also consider the potential for delayed diagnosis of serious underlying conditions. If a patient presents with new or worsening severe symptoms (e.g., crushing chest pain or severe headache) during or after an acupuncture session, the practitioner must immediately recognize the limits of their scope of practice and ensure prompt referral to emergency medical services, rather than attempting to treat the potentially life-threatening event with acupuncture itself.

## Infectious Risks Associated with Acupuncture

Infectious complications represent a preventable yet serious category of adverse events, directly linked to inadequate sterilization practices or failure to maintain aseptic technique. Historically, before the mandated use of disposable needles, transmission of blood-borne pathogens such as Hepatitis B (HBV) and Hepatitis C (HCV) was a significant concern. Today, the global standard

requires the use of **sterile, single-use, disposable needles**, which has dramatically reduced the risk of direct cross-contamination of these viruses. However, the risk of infection remains if practitioners reuse disposable needles, fail to adequately clean and prepare the skin prior to insertion, or contaminate the needles during handling.

The most common infectious adverse event observed today is localized bacterial infection, manifesting as cellulitis, abscess formation, or local pustules at the needle site. These infections are typically caused by common skin flora, such as *Staphylococcus aureus*, which are introduced subcutaneously due to insufficient skin preparation (e.g., failure to use an alcohol swab or other antiseptic) or contaminated hands. While usually treatable with antibiotics, severe or deep-seated abscesses can require surgical drainage and may lead to prolonged recovery or scarring. Preventing these infections requires rigorous adherence to the principles of clean technique, including thorough hand hygiene, use of gloves when appropriate, and meticulous disinfection of the insertion site before every needling procedure, regardless of the patient's perceived risk profile.

In extremely rare cases, systemic infections, such as septic arthritis, osteomyelitis (bone infection), or even bacterial endocarditis, have been reported following acupuncture, usually stemming from deep needling near joints or in immunocompromised patients. These serious systemic events often require aggressive intravenous antibiotic therapy and prolonged hospitalization. Furthermore, when adjunct techniques are utilized, such as cupping or moxibustion, specific infectious risks related to those modalities must also be considered. For example, improper cleaning of reusable cupping equipment can transmit skin infections. Therefore, infection control protocols must encompass all aspects of the clinical environment, including the sterilization of non-disposable equipment (like guiding tubes if reused), cleanliness of linens, and proper disposal of biohazardous waste, ensuring that the entire treatment area meets high hygienic standards.

## Neurological and Musculoskeletal Complications

Acupuncture involves the precise manipulation of tissues, and consequently, neurological and musculoskeletal adverse events, though often transient, form an important subset of complications. Direct injury to a peripheral nerve is a recognized, albeit uncommon, risk. If a needle directly contacts or impinges upon a major nerve trunk, the patient may experience sudden, sharp, radiating pain (often described as an electric shock), followed potentially by temporary or, rarely, persistent numbness, tingling (paresthesia), or motor weakness in the distribution of that nerve. Common sites for potential nerve injury include the median nerve at the wrist, the ulnar nerve at the elbow, and the common peroneal nerve near the knee. Immediate withdrawal of the needle upon the patient reporting an electrical sensation is critical to prevent sustained damage. While most nerve injuries related to needling are transient neurapraxias that resolve completely within weeks, severe cases involving axonotmesis (damage to the axon) can result in prolonged functional impairment, necessitating specialist neurological intervention and rehabilitation.

Musculoskeletal injuries primarily involve the potential for muscle soreness, spasms, or deep tissue trauma. Needling into highly tense or sensitive muscle tissue can sometimes trigger a localized muscle twitch (fasciculation) or a temporary painful spasm, which usually subsides quickly if the needle is adjusted or removed. More significant musculoskeletal complications include tendon or ligament damage, particularly if needles are manipulated vigorously near joints or if the patient resists the insertion. While rare, documented cases of tendonitis or localized tissue inflammation resulting from mechanical trauma emphasize the need for gentle insertion and careful manipulation, particularly in patients with pre-existing orthopedic conditions. Practitioners must also be highly cognizant of the risk of causing a localized hematoma that tracks along fascial planes, leading to deep, persistent pain.

Beyond direct physical trauma, neurological symptoms related to the treatment session itself, such as post-acupuncture headache, are also reported. While often mild and self-limiting, these headaches may sometimes be related to retained tension, systemic reactions (like dehydration following a vasovagal episode), or, in extremely rare instances, a sign of a more serious underlying issue exacerbated by the treatment. Practitioners must differentiate between a simple tension headache and symptoms suggestive of intracranial hemorrhage or other severe neurological events. Furthermore, psychological adverse reactions, such as increased anxiety, panic attacks, or transient emotional distress during the session, especially when intense *de qi* sensations are evoked, should be managed appropriately with reassurance and adjustment of the treatment approach, recognizing the strong mind-body interaction inherent in this therapy.

## Contributing Factors and Practitioner Responsibility

The occurrence and severity of adverse events are not solely dependent on the procedure itself but are significantly modulated by various contributing factors related to the patient, the practitioner, and the environment. Patient-related factors include underlying medical conditions such as bleeding disorders (e.g., hemophilia), use of anticoagulant medications (e.g., warfarin, aspirin), severe immunosuppression, or anatomical variations (e.g., scoliosis affecting lung placement). Patients who are highly anxious, fatigued, or fasting are more susceptible to vasovagal reactions. Therefore, the practitioner's primary responsibility is to conduct a thorough and meticulous intake history, identifying all relevant contraindications and modifying the treatment plan accordingly, such as employing superficial needling or avoiding high-risk points entirely when necessary.

Practitioner competence is arguably the most critical determinant of safety. A lack of adequate training in human anatomy, particularly surface anatomy and the precise location of underlying vascular and neurological structures, is a direct pathway to serious adverse events like pneumothorax or nerve damage. Furthermore, poor clinical judgment, such as needling a patient who is clearly unstable or failing to follow standardized sterilization protocols, drastically increases

risk. **Professional accountability** requires not only technical skill but also the ability to recognize and manage potential complications immediately. This includes having protocols in place for managing syncope, knowing when to stop treatment, and understanding the legal and ethical obligation to refer patients to emergency care when a serious event is suspected.

Environmental and equipment factors also play a role. The use of non-sterile or damaged needles, or working in a non-hygienic clinical setting, directly contributes to infectious risks. Furthermore, distractions in the treatment room or poor lighting can lead to procedural errors. To mitigate these risks, regulatory bodies emphasize continuous professional development, mandatory training in clean needling techniques, and periodic audits of clinical environments. Ultimately, the burden of responsibility rests on the licensed practitioner to ensure that every aspect of the treatment--from the initial patient assessment and informed consent process to the final disposal of the needle--adheres to the highest possible standards of care, thereby transforming theoretical risks into statistically negligible occurrences.

## Regulatory Framework and Risk Mitigation Strategies

Effective risk mitigation in acupuncture practice relies heavily on robust regulatory oversight, standardized training, and mandatory reporting systems. Licensing bodies and professional associations worldwide establish minimum standards for training duration, curriculum content (with a strong emphasis on anatomy and sterilization), and clinical competency exams. These regulatory frameworks ensure that only individuals who have demonstrated proficiency in safe needling techniques are permitted to practice. Central to these regulations is the requirement for **informed consent**, where the patient is educated about the procedure, the expected therapeutic effects, and the potential risks--including the rare possibility of serious adverse events--before treatment commences. This process ensures patient autonomy and shared decision-making regarding potential risks.

Key risk mitigation strategies employed by practitioners include specific technical adjustments tailored to high-risk anatomical areas. For example, when needling points on the chest or upper back, oblique or transverse insertion techniques are mandated to keep the needle superficial and parallel to the rib cage, minimizing the chance of pleural puncture. For points near major arteries or nerves, careful palpation is used to locate and avoid these structures. Furthermore, the selection of needle size (gauge and length) must be appropriate for the patient's body mass index and the depth required, avoiding the use of excessively long needles that increase the temptation for deep, potentially unsafe insertion.

Finally, the development of centralized, mandatory reporting systems for adverse events is crucial for improving safety across the profession. While voluntary reporting systems often suffer from underreporting, mandatory systems allow regulatory bodies to collect comprehensive data on the

incidence, nature, and contributing factors of serious complications. Analysis of this data informs the revision of educational curricula, the development of best practice guidelines, and the issuance of safety alerts regarding specific techniques or equipment. By embracing transparency and prioritizing continuous safety improvements based on robust data, the acupuncture profession can maintain its positive safety profile while systematically reducing the incidence of all adverse events.

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