

**The efficacy of acupuncture in animals – Part 1  
Veterinary medicine use, historical background, theoretical foundations,  
techniques and tools, points and meridians and physiological mechanisms of  
acupuncture in animals**

**Eficácia da acupuntura em animais – Parte 1  
Uso na veterinária, histórico, fundamentos teóricos, técnicas, pontos,  
meridianos e mecanismos fisiológicos da acupuntura AP em animais**

**Efectividad de la acupuntura en animales – Parte 1  
Uso veterinario, historia, fundamentos teóricos, técnicas, puntos, meridianos y  
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## ABSTRACT

Holistic approach in veterinary has gained popularity in recent years. However, more research is needed to fully understand the effects of acupuncture (AP) in animals and to determine its safety and efficacy. This review work aimed to describe AP in animals, regarding the use in Veterinary Medicine, historical background, theoretical foundations, techniques and tools for animals, AP points and meridians and physiological mechanisms of AP in animals. Although AP use in animals has been practiced for thousands of years, scientifically efficacy based studies are still lacking in the research community. This ancient traditional Chinese method involves inserting thin needles in specific acupoints to induce vital energy balance across skin meridians to produce biological responses from the nervous system. Understand the impact and potential healing powers that exist within these vital points is crucial, because AP can positively influence in health and well-being of animals. Musculoskeletal pain, respiratory issues, reproductive and metabolic disorders are the most frequent described AP treatments in veterinary practice. With proper application, AP can be a valuable tool in treating various health conditions and promoting well-being. It is important to consider potential risks, as well other treatment protocols and consult with a qualified veterinary before undergoing AP treatment.

**Keywords:** alternative medicine, complementary medicine, tradicional Chinese medicine.

## RESUMO

Os métodos holísticos na veterinária tornaram-se populares na atualidade. Dessa forma, mais estudos são necessários para compreender os efeitos da acupuntura (AP) nos animais e para determinar a segurança e eficácia desse tratamento. Nesse trabalho de revisão objetivou-se descrever a AP em animais considerando o uso na medicina veterinária, o histórico, fundamentos teóricos, técnicas e ferramentas para uso em animais, definições de pontos de acupuntura e mecanismos fisiológicos da AP em animais. Embora a prática da AP em animais seja realizada por milhares de anos, estudos científicos de eficácia são escassos na comunidade científica. Esse método tradicional chinês é milenar e envolve a inserção de agulhas finas em acupontos específicos para induzir o equilíbrio da energia vital através do estímulo aos meridianos para produzir respostas biológicas do sistema nervoso. Entender o impacto e o potencial poder de cura que existe nesses pontos vitais é essencial porque AP pode influenciar positivamente a saúde e o bem estar de animais. Dores musculoesqueléticas, problemas respiratórios e reprodutivos, além de desordens metabólicas são as descrições mais frequentes de tratamento com AP na veterinária. Com aplicação adequada, AP pode ser recurso terapêutico valioso para tratar diversas condições de saúde e promover bem-estar. É importante ponderar os riscos potenciais da metodologia, assim como qualquer outro protocolo de tratamento e consultar veterinário capacitado antes de optar por tratamento com AP.

**Palavras-chave:** medicina alternativa, medicina complementar, medicina tradicional chinesa.

## RESUMEN

Los métodos holísticos en medicina veterinaria se han vuelto populares hoy en día. Por tanto, se necesitan más estudios para comprender los efectos de la acupuntura (AP) en animales y determinar la seguridad y eficacia de este tratamiento. Este trabajo de revisión tuvo como objetivo describir la AP en animales considerando su uso en medicina veterinaria, la historia, fundamentos teóricos, técnicas y herramientas para su uso en animales, definiciones de puntos de acupuntura y mecanismos fisiológicos de la AP en animales. Aunque la práctica de AP en animales se lleva realizando desde hace miles de años, los estudios científicos sobre su efectividad son escasos en la comunidad científica. Este método tradicional chino es antiguo e implica la inserción de finas agujas en puntos de acupuntura específicos para inducir el equilibrio de la energía vital estimulando los meridianos para producir respuestas biológicas del sistema nervioso. Comprender el impacto y el potencial poder curativo que existe en estos puntos vitales es fundamental porque la AP puede influir

positivamente en la salud y el bienestar de los animales. Dolor musculoesquelético, problemas respiratorios y reproductivos, así como trastornos metabólicos son las descripciones más frecuentes del tratamiento AP en medicina veterinaria. Con una aplicación adecuada, la AP puede ser un recurso terapéutico valioso para tratar diversas afecciones de salud y promover el bienestar. Es importante considerar los riesgos potenciales de la metodología, así como cualquier otro protocolo de tratamiento, y consultar a un veterinario cualificado antes de optar por el tratamiento con AP.

**Palabras clave:** medicina alternativa, medicina complementaria, medicina tradicional china.

## 1 INTRODUCTION

Acupuncture (AP) involves the insertion of thin needles into specific points on the body, stimulating natural healing responses. Theory and terminology of AP and treatment principles in animals are quite similar to those used in humans. Some variations are the anatomy that differs from human, consequently, meridians and associated acupoints are diverse, as well animal handling and acceptability level during needles insertion (Cui *et al.*, 2021; Han *et al.*, 2021; Hobbs, 2020; Matos *et al.*, 2021; Mi *et al.*, 2021; Pu *et al.*, 2022; Swathy and Devi, 2020).

The main objectives of AP therapy in animals are to balance internal energy in order to relieve pain, carry out sedation, treat trauma, stimulate appetite, control urinary and reproductive disorders, relax the muscles, prevent infectious diseases and alleviate discomfort. In veterinary medicine (VM), AP is an effective curative and preventive treatment for a wide variety of clinical conditions, including chronic pain, musculoskeletal and neurological conditions. Horses, dogs, cats, rabbits, guinea pigs and other animals were treated with AP, which was recognized officially as an important therapy by American Veterinary Medical Association and World Health Organization (De Lucena and Lima, 2021; Ferreira and Silva, 2021; Matos *et al.*, 2021; Pu *et al.*, 2022; Rego *et al.*, 2021; Souza *et al.*, 2022; Swathy and Devi, 2020).

This holistic approach to veterinary care has gained popularity in recent years due to its non-invasive nature and ability to deliver noticeable results (Ijiri *et al.*, 2023; Lin *et al.*, 2021; Yu *et al.*, 2020; Zhang *et al.*, 2022a; Zheng and Zhou, 2022). However, more research is needed to fully understand the effects of AP in animals and to determine its safety and efficacy. (Gafarov, 2020; Zhang and Li, 2021; Zhang *et al.*, 2022a; Zhu *et al.*, 2021).

Studying alternative treatment methodologies such as AP, which may be cheaper and efficient, is important to ensure the treatment of sick animals, regardless of the owner's purchasing power, mainly in development countries. Consequently, this research may contribute in theoretical and practical ways by discussing the recent body of knowledge about AP. Therefore, the aim of this work is to describe the efficacy of AP in animals regarding the use in Veterinary Medicine, historical

background, theoretical foundations, techniques and tools for animals, AP points and meridians and physiological mechanisms of AP in animals.

## **2 USE OF ACUPUNCTURE (AP) IN ANIMALS**

### **2.1 HISTORICAL BACKGROUND OF AP IN ANIMALS**

The theory and principles of AP therapy in animals have been refined and perfected based on the expertise, experience, and knowledge gained over the centuries by TCM practitioners. As a result, AP use in VM has withstood the test of time and has been proven effective and beneficial in the treatment of a wide range of animal's medical conditions. Therefore, AP therapy has continued to evolve and advance over the centuries to become a reliable medical treatment that is now widely used in VM worldwide (Cui *et al.*, 2021; Han *et al.*, 2021; Hobbs, 2020; Matos *et al.*, 2021; Pu *et al.*, 2022; Swathy and Devi, 2020; Yang *et al.*, 2022; Zhao *et al.*, 2021).

The widespread use of AP in VM has made a profound impact on the treatment of animals. Veterinarians have been integrating AP into their practices, and studies have supported the efficacy of this method in addressing various animals' health conditions. Pain management, neurological disorders, gastrointestinal issues and musculoskeletal problems have been successfully treated with AP. The holistic nature of AP has also contributed to its appeal, as it focuses on restoring balance and promoting overall well-being. As more research is conducted on the benefits of AP in VM, it has become an integral part of many animal care practices worldwide. The integration of AP into conventional VM has opened up new ways for treating animals and has provided a complementary approach to traditional interventions. Thus, AP plays a significant role in enhancing animals health and wellness across the globe (Cui *et al.*, 2021; Han *et al.*, 2021; Hobbs, 2020; Matos *et al.*, 2021; Pu *et al.*, 2022; Swathy and Devi, 2020; Yang *et al.*, 2022; Zhao *et al.*, 2021).

AP has proven to be a valuable resource in VM, contributing to the improvement of animal health through its deeply rooted historical significance and its evolution into a modern therapeutic practice. AP utilization as animal's treatment modality has become increasingly prevalent, reflecting the benefits and outcomes observed by professionals. The concept of AP involves the insertion of thin needles into specific points on the body, stimulating the natural healing responses. This intervention has demonstrated positive outcomes in dogs, cats, horses, exotic pets and other. The adaptability of AP as a therapeutic tool for several species has further enhanced its relevance and applicability in VM. Recognition of AP as a viable treatment option for animals is a testament to its enduring presence and impact in the field of veterinary care. As clinical evidence continues to support AP effectiveness in addressing animal health concerns, its integration into mainstream VM further validates its status as a valuable therapeutic intervention (De Lucena and Lima, 2021;

Ferreira and Silva, 2021; Han *et al.*, 2021; Hobbs, 2020; Matos *et al.*, 2021; Mi *et al.*, 2021; Pu *et al.*, 2022; Rego *et al.*, 2021; Souza *et al.*, 2022; Swathy and Devi, 2020).

The timeless tradition of AP has evolved into a cornerstone of animal health and well-being, embodying a blend of ancient wisdom and modern medical practice. AP's capacity to address a wide array of conditions in animals, such as musculoskeletal pain, respiratory issues and metabolic disorders underscores its versatility and efficacy in VM. Moreover, its holistic approach to healing and its ability to complement conventional veterinary treatments have solidified its position as an essential component of modern animal care. As the demand for complementary and alternative therapies in VM continues to grow, the enduring appeal and proven effectiveness of AP position it as a significant and indispensable modality in promoting animals' health and welfare. Veterinary professionals around the world are increasingly recognizing the AP value and incorporating it into their practice. Additionally, AP plays instrumental role as a complementary therapeutic approach in the contemporary treatment of animal health conditions (Cui *et al.*, 2021; Han *et al.*, 2021; Hobbs, 2020; Matos *et al.*, 2021; Mi *et al.*, 2021; Pu *et al.*, 2022; Swathy and Devi, 2020; Yang *et al.*, 2022; Zhao *et al.*, 2021).

The history of AP in TCM is rich and dates back to the Stone Age. The ancient practice of AP in VM has a long history, particularly in the countries of the Far East. In China, AP has been utilized in both humans and animals for over 3,000 years. Creation and development of this traditional treatment is credited to the emperor Huang Di, who authored *Boğza*, the Yellow Emperor's Internal Medicine, a significant medical treatise. The section of the text that pertains to AP is referred to as the *Ling Shu*. The use also been influenced by religious factors with Indian medicine adopting AP in animals. The fundamental AP principles, the basis of the current practices, were established approximately 5,000 years ago. Historical sources suggest that AP first appeared in China and was subsequently brought to India by Buddhist priests. To this day, AP continues to be extensively practiced in the Far East, largely due to the strong religious influences prevalent in these regions. The practice has also gained significant popularity in Western countries, contributing to its global spread and recognition as an effective healthcare approach (Cui *et al.*, 2021; Han *et al.*, 2021; Hobbs, 2020; Matos *et al.*, 2021; Mi *et al.*, 2021; Pu *et al.*, 2022; Swathy and Devi, 2020; Yang *et al.*, 2022; Zhao *et al.*, 2021).

By the second century *Anno Domini*, traditional Chinese medical authors had extended all theoretical concepts and diseases that they treated in man to include domestic animals, poultry and occasionally wildlife. Works recorded between 594 and 617 years demonstrated vascular points used in human and domestic animals. These shown that people have been using needling therapy to treat animals for thousands of years. There followed a long period in which the AP use on domestic

animals was not mentioned (Han *et al.*, 2021; Han *et al.*, 2021; Hobbs, 2020; Matos *et al.*, 2021; Pu *et al.*, 2022; Yang *et al.*, 2022; Zhao *et al.*, 2021).

As AP continues to evolve, new applications and techniques are emerging, further demonstrating its significance and impact in traditional and modern medicine. The rich and diverse history of AP in TCM spans thousands of years, with its origins extending back to the Stone Age. In addition, the VM has increasingly recognized the importance of AP, with historical evidence showing a sophisticated understanding of the practice dating back to 300 B.C. years. AP was commonly used in this period, as described in written records that indicate the treatment of various animal species, including horses, cows, pigs, sheep, cats and dogs (Dewey and Xie, 2021; Ferreira and Silva, 2021; Harrison and Churgin, 2022; Kwon *et al.*, 2021; Lai *et al.*, 2020; Lee and Kim, 2022; Sousa *et al.*, 2024; Souza *et al.*, 2022).

The AP principles and techniques are founded in antique Chinese medical texts that date back to more than two millennia. These writings include the *Huangdi Neijing* (Yellow Emperor's Inner Canon), *Nan Jing* (Classic of Difficulties) and *Zhen Jiu Jia Yi Jing* (A-B Classic of AP and Moxibustion), which laid the groundwork for the AP theory, practice and therapies. The widespread use of AP in the treatment of various medical conditions in animals is a practice that has been in used for several centuries (Cui *et al.*, 2021; Pu *et al.*, 2022; Yang *et al.*, 2022; Zhao *et al.*, 2021).

Over the course of two millennia, AP has evolved into an empirical technique that has developed alongside the modern scientific medical practice. The use of AP on animals in the Sino-Tibetan language tradition has remarkable similarities to traditional western veterinary practices (VP), suggesting a shared history and development of AP techniques across cultures. This mutual influence has greatly expanded the application of AP to various animal species and health conditions, resulting in its widespread utilization in VM and advancement in scientific understanding. As AP continues to progress and transform, new applications and techniques continue to emerge, displaying its continued significance and positive impact in traditional and modern medicine (Oh and Kim, 2022; Sung *et al.*, 2021; Tang *et al.*, 2020; Trento *et al.*, 2021; Zhang *et al.*, 2022a and 2022b).

After 1644, and mostly in the 19th-20th centuries, animal AP practice becomes frequent, particularly in horses of wealthy families. During these times, AP therapy on horses, applied by well versed in TCM practitioners was an effective and reliable method for treating several injuries, musculoskeletal problems and respiratory ailments, among others. This practice regarded as a crucial aspect of maintaining health and well-being of prized horses, so was highly sought after. It became a horse care integral part, especially in recovery process. Dietary and lifestyle recommendations intended to optimize the overall health and performance of the horses often

accompanied its application (Han *et al.*, 2021; Han *et al.*, 2021; Hobbs, 2020; Matos *et al.*, 2021; Pu *et al.*, 2022; Yang *et al.*, 2022; Zhao *et al.*, 2021).

Thus, AP gradually gained prominence as valuable and essential component of horses care, as it yielded positive results that were visibly beneficial to the animals' physical condition and vitality. During this time, the use of AP also expanded to include a holistic approach to animal health, incorporating preventive measures and focusing on the overall animal's well-being. This approach aimed to address root causes of health issues rather than just treating the symptoms, ultimately promoting long-term health and vitality. Beyond purely medical applications, AP use on horses also became associated with cultural significance sense, reflecting traditional practices that held deep historical origins. As TCM and alternative therapies interest grew, AP for animals became more mainstream, extending its applications beyond the wealthy elite to a wider audience of owners and caretakers (Matos *et al.*, 2021; Pu *et al.*, 2022; Yang *et al.*, 2022; Zhao *et al.*, 2021).

The practice continued to evolve over time, with practitioners continually refining techniques and expanding knowledge of effectively AP apply to horses and other animals. Ongoing research and case studies cemented the role of AP as a respected and trusted treatment method for a variety of animal health concerns, contributing to its enduring legacy in the field of VM. The AP use in VM further inspired specialized training programs and academic studies development on AP for animals, solidifying its role as a validated and scientifically recognized treatment. These advancements have continually enhanced the understanding of AP's mechanisms and potential applications in VM, spurring the development of innovative techniques and opening new possibilities for treating complex medical conditions in animals. Thus, AP has become increasingly integrated into VP, by providing complementary and alternative treatment option for various health issues, contributing to the overall well-being of animals (Cui *et al.*, 2021; Han *et al.*, 2021; Han *et al.*, 2021; Hobbs, 2020; Matos *et al.*, 2021; Pu *et al.*, 2022; Yang *et al.*, 2022; Zhao *et al.*, 2021).

AP has been showed an effective complementary therapy for managing behavioral and psychological problems in animals, such as anxiety, depression and phobias. AP in VM is gaining widespread acceptance and recognition as safe, effective and holistic approach for treatment of various conditions. Moreover, AP is within the scope of Traditional Chinese Medicine (TCM), which is an ancient medical practice that was used in treatment of medical conditions in humans and animals (Han *et al.*, 2021; Hobbs, 2020).

## 2.2 THEORETICAL FOUNDATIONS OF AP IN VETERINARY PRACTICE

Veterinary AP dates its history back to 1972. It started when a neurophysiologist, Dr. I. U. Kim, engaged in research on AP analgesia, and then in vogue in human laboratories, proposed Dr.

L. V. Pogosian, veterinary, to carry out an experiment with AP on animals. Six months later, Dr. Pogosian make the first trial AP anesthesia during surgical removal of a dog-prolapsed intervertebral disc. Published in 1973, first veterinary AP works initially focused application of anesthesia, with help of metals, metal alloys, cement, plastics, polyplexes and other materials. The traditional theory of veterinarian acupoint after the Eastern variety included the names and other properties based on their location used in AP, electrical conditions and reflexological activity (Burton-Rose and Wu, 2021; Chee, 2021; Hein, 2022; Holtz, 2021; Zeng *et al.*, 2021).

Lately, veterinary AP practice method progress and optimization have focused on acupoint physical location, multimodal stimulation, evidence of pain-inhibiting effects and new techniques and equipment development. Many veterinarians have incorporated it into their treatment regimens, resulting in improved patient outcomes and overall satisfaction with AP as a viable and effective animal's treatment option. AP has gained widespread acceptance and popularity, with several scientific studies supporting its efficacy, being capable to manage musculoskeletal problems, neurologic disorders, gastrointestinal issues and respiratory ailments in animals. Acupoint stimulation has proven pain management effectiveness, inflammation reduction and tissue healing promotion. The veterinary AP practice continues to evolve, with ongoing research exploring new applications and enhancing existing techniques. As a result, it is anticipated that these field will expand in the coming years (Burton-Rose and Wu, 2021; Chee, 2021; Hein, 2022; Holtz, 2021; Matos *et al.*, 2021; Zeng *et al.*, 2021).

The CTM viewpoint links animal body functioning to Qi, the natural energy that flows through the meridians (channels). When Qi flows freely along meridians, animal's body is in balance with nature. Health is associated with that energy and disease results from an imbalance of Qi. Acupuncturists use needles at specific body points for treatment purposes to help redirect energy. The AP point's choice is not random. According to Chinese theory, each point reflects a different anatomic region, metabolic function, sense organ or body organ. The inserted points can be depths up to several inches allowing manipulation or even electrical stimulation. AP, a TCM key component, involves extremely thin needles insertion through skin at strategic body acupoints, and to treat pain is most common use. TCM explains AP as a technique for balancing energy flow or life force, known as Qi or Chi (CHEE), believed to flow through body pathways, meridians. By inserting needles into specific points along these meridians, AP practitioners believe that energy flow will re-balance. AP is effective in a variety of health issues, including chronic pain, osteoarthritis and postoperative nausea and vomiting (Abali *et al.*, 2022; Baker-Meuten *et al.*, 2020; Dewey and Xie, 2021; Holyoak and Ma, 2022; Huntingford and Petty, 2022; Koh and Harrison, 2023; Lin *et al.*, 2022; Oh and Kim, 2022; Wu *et al.*, 2021; Zhang *et al.*, 2022a).



Moreover, AP as a complementary therapy for animals maintain overall well-being and alleviate pain or discomfort due to injuries or medical conditions. As a result, AP is a valuable and well-established form of treatment for both humans and animals. The TCM have long regarded AP as a beneficial practice for maintaining physical and mental health. Through strategic placement of needles and manipulation of energy, the practice seeks to instill balance within the body and alleviate various ailments. Whether implemented in TCM or utilized for veterinary, AP benefits and efficacy are widely recognized and continue to grow in appeal and positive outcomes for humans and animals. AP serves as a promising modality to address pain, discomfort, and a wide range of conditions, aiding in overall wellness of those treated. With its established success in treating various ailments, AP regarded as an essential therapeutic approach for relieving pain and promoting overall health and well-being. This practice offer relief in several health conditions and is now accepted as a mainstream treatment modality for animals (Abali *et al.*, 2022; Baker-Meuten *et al.*, 2020; Dewey and Xie, 2021; Holyoak and Ma, 2022; Huntingford and Petty, 2022; Koh and Harrison, 2023; Lin *et al.*, 2022; Oh and Kim, 2022; Wu *et al.*, 2021; Zhang *et al.*, 2022b).

### 2.3 ACUPUNCTURE TECHNIQUES AND TOOLS FOR ANIMALS

Frequently veterinaries combines AP with other alternative and traditional therapies and it enhances positive results of standard treatments. Despite the common belief held by both human and veterinary patients that acupoints are complex, it were easily found in animals. Veterinary AP requires versatile universal points instead of series of points in specific topographic orientations. This is a crucial difference, so in many cases AP points are systematically separated from acupressure points, because the emphasis of AP techniques must be animal comfort and safety. Any mishandling techniques can lead to problems, so it is essential to receive detailed practical instruction in AP veterinarian theory and systems, including proper needle management to prevent complications. The term "dry needling" refers to not well-versed AP practitioners who are prohibited to perform AP and acupressure procedures on animals (Cheung *et al.*, 2021; Cristino *et al.*, 2021; Koh and Harrison, 2023; Li *et al.*, 2022a; Matos *et al.*, 2021).

For a veterinary professional, gaining expertise in AP is an important step towards offering comprehensive care for animals. The AP integration into VP comes with a responsibility to ensure animal well-being. Understanding the nuances of animal acupoints requires ongoing education, as well ability to adapt treatment plans based on individual animal's needs (Adair, 2022; Benson *et al.*, 2023; Haussler, 2022; Li, 2022; Patil, 2024).

In addition to enhancing the effectiveness of standard treatment methods, AP can be a valuable tool for addressing a wide range of animals' conditions. From pain management to

behavioral issues, AP offers a holistic approach that complements traditional veterinary care. AP improve blood flow, reduce inflammation and stimulate natural pain-relieving chemicals release, so is non-invasive and drug-free animals treatment option (Abali *et al.*, 2022; Lai *et al.*, 2020; Lee and Kim, 2022; Lin *et al.*, 2022; Moré *et al.*, 2021; Oh and Kim, 2022; Wu *et al.*, 2021; Yang *et al.*, 2020; Yang *et al.*, 2022).

Veterinary AP practice requires a deep understanding of animal physiology, behavior, and TCM. By incorporating AP, veterinarians can provide a more comprehensive and personalized approach to animal care, enhancing patients well-being. It can also help to improve the overall quality of life for animals by addressing a wide array of issues such as musculoskeletal, respiratory and digestive disorders. AP can aid chronic conditions management and contribute to animal longevity. It also promotes relaxation and stress reduction, contributing to emotional well-being. Thus, AP is a gentle and natural approach that if used with other therapies or no can offer a well-rounded approach to veterinary care (Berger *et al.*, 2021; Chueainta *et al.*, 2022; Koh and Harrison, 2023; Lin *et al.*, 2021; Lin *et al.*, 2022; Wu *et al.*, 2021).

Generally, animals find AP treatments to be comfortable and painless and look forward to them. Pet owners have often viewed AP as a "treat" for their pets. Using scientific evidence, many veterinarians verified positive response to AP treatments. Several new techniques appear to make the application of AP even safer in animals, certainly less scary and more accommodating. Among the many therapeutic indications for AP are acute and chronic pain, as well as inflammatory, muscular and neurologic diseases (Chen *et al.*, 2022a; Ding and Ma, 2024; Koh and Harrison, 2023; Koh *et al.*, 2023; Li *et al.*, 2024; Yang *et al.*, 2021a; Yang *et al.*, 2024a).

AP is a powerful form of alternative medicine for horses, dogs, cats and birds, offering a wide range of benefits that can address various health issues and ailments. By stimulating specific points on an animal's body, AP has the potential to alleviate pain, reduce inflammation and promote healing. This holistic approach to veterinary care has gained popularity in recent years due to its non-invasive nature and ability to deliver noticeable results (De Lucena and Lima, 2021; Ijiri *et al.*, 2023; Lin *et al.*, 2021; Rego *et al.*, 2021; Souza *et al.*, 2022; Yang *et al.*, 2024b; Yu *et al.*, 2020; Zhang *et al.*, 2022a; Zheng and Zhou, 2022).

The benefits of AP for animals extend far beyond physical health. Animals receiving AP treatments exhibit reduced stress, less anxiety and improving of behavioral issues. By restoring balance and energy flow within the body, AP can contribute to mental and emotional well-being. AP has the potential to provide relief and increase quality of life of the animals with arthritis, neurological conditions or digestive problems (Chen *et al.*, 2022b; Cheng *et al.*, 2022; Jang and

Park, 2022; Jiang *et al.*, 2023; Kawanokuchi *et al.*, 2021; Kwon *et al.*, 2021; Mier, 2021; Seo *et al.*, 2021; Yang *et al.*, 2021b).

In addition to addressing specific health concerns, AP also plays a role in preventive care for animals. By enhancing the immune system and promoting overall wellness, AP can help animals maintain optimal health and reduce the risk of future health issues. This proactive approach to VM highlights the long-term benefits of AP treatments for animals (Cheung *et al.*, 2021; Harrison and Churgin, 2022; Koh and Harrison, 2023; Lin *et al.*, 2021; Lin *et al.*, 2022; Su *et al.*, 2020; Wang *et al.*, 2023; Yu *et al.*, 2020).

As more veterinarians recognize the positive impact of AP on animals, the demand for qualified practitioners grows. For professionals looking to expand their expertise and offer holistic treatment options, exploring AP training and certification can open up new opportunities for practice. Additionally, professionals who refer their animal patients for AP treatments can contribute to a comprehensive and integrative approach to animal care (Gilberg *et al.*, 2021; Holyoak and Ma, 2022; Koh and Harrison, 2023; Magalhães-Sant'Ana *et al.*, 2023; Medeiros and Scognamillo-Szabó, 2024; Memon *et al.*, 2021; Scanlan, 2024; Stanossek and Wehrend, 2022 and 2023; Wehrendb, 2023).

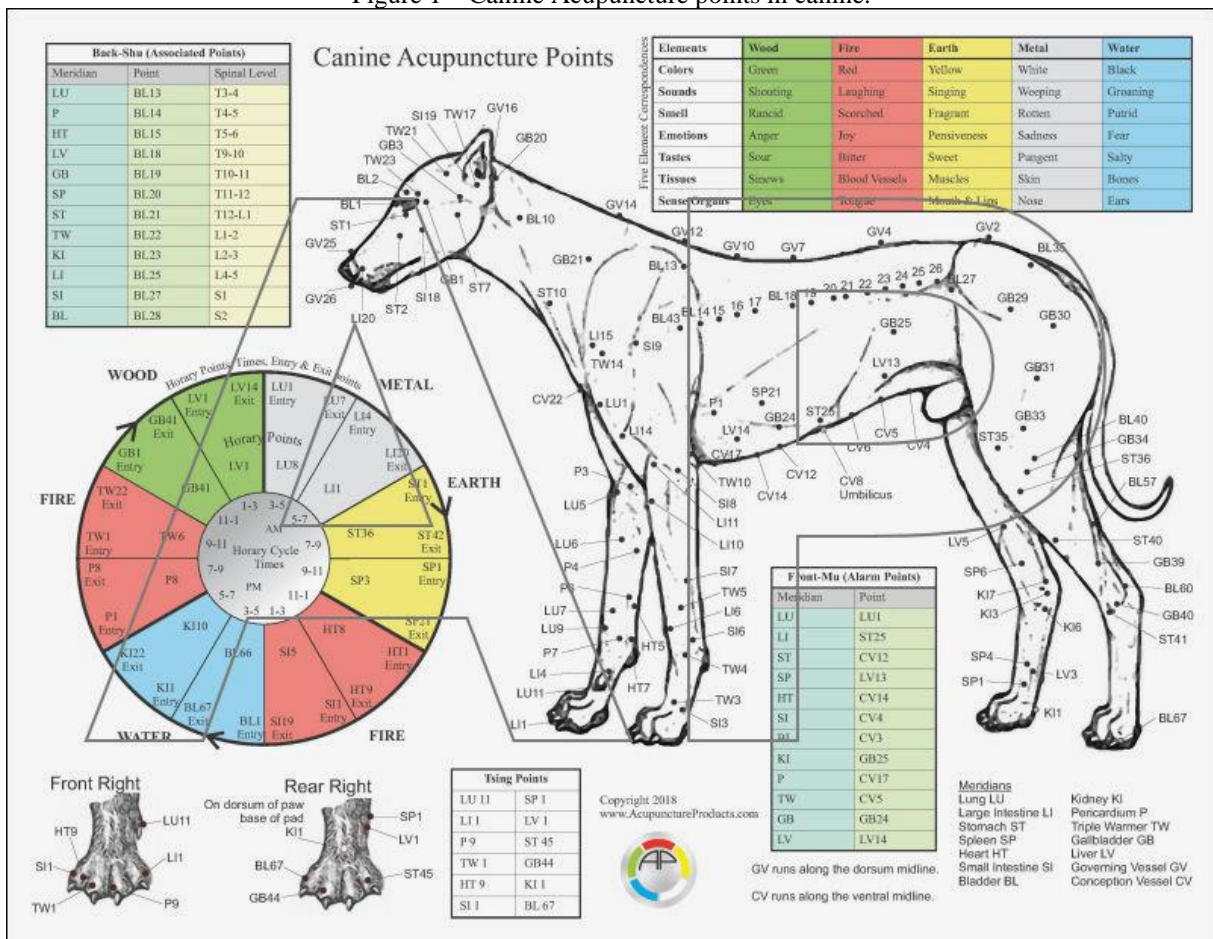
With ongoing research and advancements in veterinary AP, the future holds promising developments in the field of animal wellness. As the benefits and mechanisms of AP become increasingly understood, animals of all kinds can look forward to improved health, comfort, and vitality. AP stands as a valuable healing modality for animals in managing pain, addressing chronic conditions or promoting overall well-being (Cui *et al.*, 2021; Dewey and Xie, 2021; Harrison and Churgin, 2022; Kwon *et al.*, 2021; Lin *et al.*, 2022; McTiernan, 2022; Trento *et al.*, 2021; Wu *et al.*, 2021; Zhang *et al.*, 2022b).

#### 2.4 ACUPUNCTURE POINTS AND MERIDIANS IN ANIMALS

North American, English, French, or Brazilian researchers confirmed canine and feline AP points studied in the 1990s and indicated AP points or auricular zones in other animals. Investigators from Brazil had the ambition to contribute at lower human and animal treatment costs with AP. The presence of energetic points in animals has not arisen as a characteristic whose origin is in the simplicity of this type of therapy. Researchers demonstrated that it exists in animals and this type of therapy would be equally effective in them (Bergh *et al.*, 2021; Casas-Alvarado *et al.*, 2022; Caterino *et al.*, 2021; D'Angelo *et al.*, 2021; DeWey e Xie, 2021; Domínguez-Oliva *et al.*, 2021; Dragomir *et al.*, 2021; Gruen *et al.*, 2022; Lewis *et al.*, 2020).

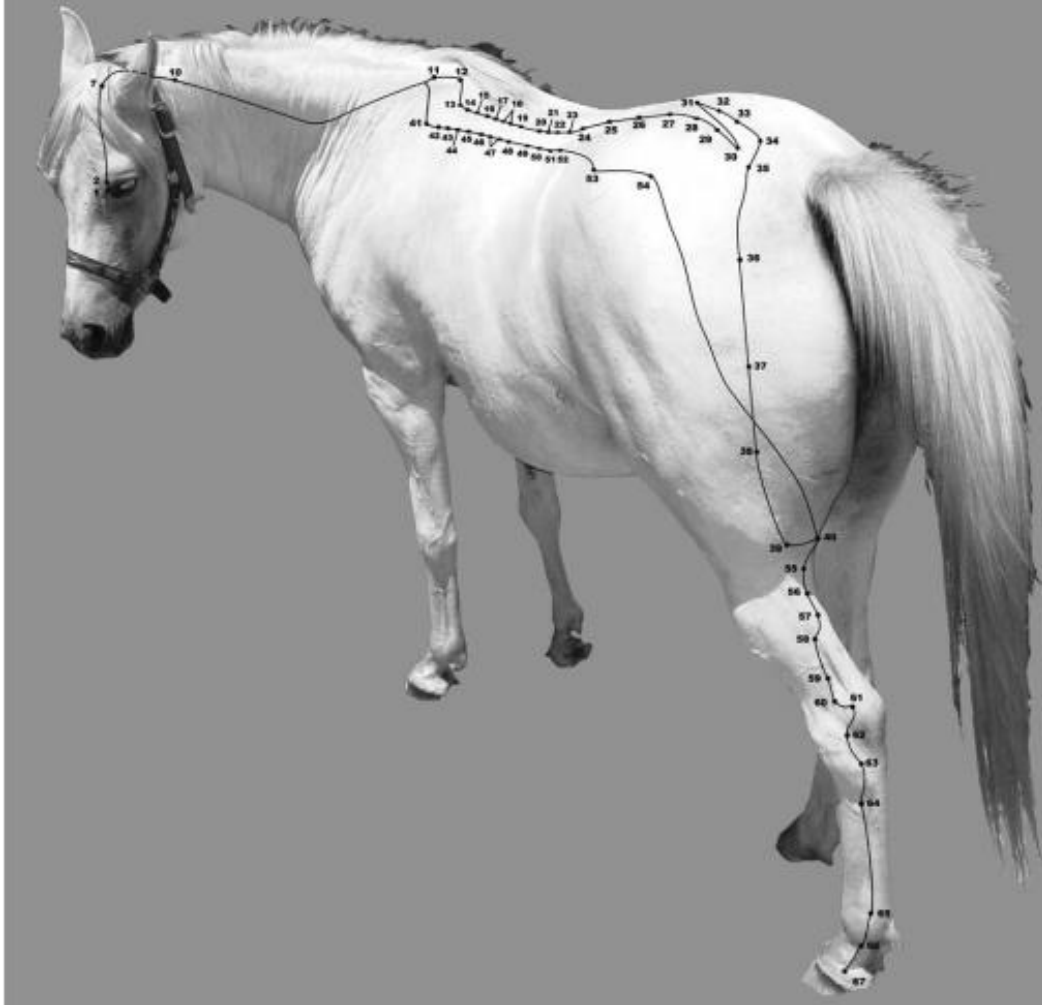
The concept of AP is not exclusive to TCM; the existence of specific points (Figures 1 and 2) that present associations with physiological alterations throughout the whole body is also a precept of primordial ancient medical wisdom. In current zoological terms, these areas are referred to as acupoints or energetic points. These points in animals have direct or indirect action on the skeletal, endocrine, neurological, lymphatic, circulatory, immunological and visceral systems, as in human beings. Similarly, the term meridian, which represents the imaginary lines that connect AP points, is mentioned currently as the physiological guide of myofascial chains. Equine myofascial chains are already described in concepts and clinical applications and are similar to these chains described in human AP (Claassen *et al.*, 2021; Cirino *et al.*, 2023; Kulkarni *et al.*, 2022; Oh and Kim, 2022; Wang *et al.*, 2021).

Figure 1 – Canine Acupuncture points in canine.



Source: available from: <https://acesse.dev/scG6I>. Access on: Oct. 30<sup>th</sup> 2024.

Figure 2 – Bladder Channel of horses.



Source: H. Xie, Veterinary Acupuncture Atlas, Chi Institute, Reddick, FL, USA, 2003, cited by Xie and Preast, 2007. Available from: <https://acesse.dev/Dfjvz>. Access on: Oct. 30<sup>th</sup> 2024.

## 2.5 PHYSIOLOGICAL MECHANISMS OF ACUPUNCTURE IN ANIMALS

There is growing evidence that AP helps in alleviating physical conditions and has positive impact on the mental and emotional animal well-being. AP therapy has improving gastrointestinal disorders, skin conditions and metabolic imbalances in various species. Therapeutic mechanism of AP is based on regulation of neuroendocrine, immune and nervous systems. AP treatment also have effects in reducing inflammation, improving blood circulation, enhancing tissue repair and promoting animals overall wellness. AP regulate the cardiovascular and respiratory functions, contributing to the management these systems diseases (Yang *et al.*, 2022; Zhao *et al.*, 2021).

AP is a form of complementary and alternative medicine (CAM) that has been practiced for thousands of years. Its origins can be traced back to ancient China, where it was used to treat a variety of ailments and conditions. The practice involves inserting thin needles into specific points on the body, known as acupoints, with the aim of stimulating the body's natural healing processes. AP has gained popularity in the West in recent years, with an increasing number of people turning

to this traditional therapy for relief from pain, stress, and other health issues. While some studies have suggested that AP may be effective in treating certain conditions, such as chronic pain and migraines, others have found little to no evidence of its benefits (Gafarov, 2020; Zhang and Li, 2021; Zhang *et al.*, 2022b; Zhu *et al.*, 2021).

Despite this, AP continues to be embraced by many as a safe and effective treatment for a wide range of health problems. AP has also been shown to be beneficial in improving the physical and mental well-being of individuals, with some studies indicating that it can help reduce anxiety and promote relaxation. The use of AP in animals has also garnered attention, with some veterinarians incorporating it into their treatment plans for conditions such as arthritis and muscle pain. However, more research is needed to fully understand the effects of AP in animals and to determine its safety and efficacy. AP is a valuable and time-tested form of therapy that has the potential to provide relief for a range of health issues in humans and animals. Continued research and exploration into its benefits and applications will help further validate its effectiveness and enhance the overall quality of healthcare (Gafarov, 2020; Zhang and Li, 2021; Zhang *et al.*, 2022a; Zhu *et al.*, 2021).

The physiological mechanisms of AP along the axes includes pain relief, anti-inflammatory effect, immune system regulation, anti-fatigue, anti-stress and circulatory regulation. Most of the responses seen in animals mirror those in humans as well. AP is effective for patients with both acute and chronic pain. It helps to reset the pain system, thus having longer lasting effects beyond the treatment session. Although the modulation of the immune, endocrine, and nervous systems brought about by AP could be temporary, these can bring about rapid physiological changes and long-term homeostasis in both healthy and ill individuals (Bonini *et al.*, 2022; Broom, 2021; Buniyaadi *et al.*, 2020).

The role of AP in integrative medicine and its use in the treatment of both physical and psychological conditions within a holistic approach are becoming recognized. It is important to understand the neurobiological mechanisms involved to identify new therapeutic targets and establish the basis for optimizing AP treatment strategies. The development of new protocols and standards for AP practice based on advanced research and scientific evidence will contribute to enhancing effectiveness and safety. The integration of traditional knowledge with modern medical concepts provides a comprehensive framework for the successful implementation of AP in patient care and offers potential for the future development of innovative treatment approaches that can benefit several conditions (Bonini *et al.*, 2022; Broom, 2021; Buniyaadi *et al.*, 2020).

This integration can pave the way for a brighter future in healthcare and medical treatment. This future will be characterized by advancements in technology and the continued evolution of

medical practices that prioritize the well-being of patients. As the field of AP continues to expand and gain recognition, it presents the possibility of new, innovative treatment approaches that can cater to a diverse array of conditions and illnesses. These progressive developments in medical treatment have the potential to revolutionize the way healthcare is approached and administered, ultimately leading to improved patient outcomes and overall well-being (Bonini *et al.*, 2022; Broom, 2021; Buniyaadi *et al.*, 2020).

Practices such as acupoint injections, transcutaneous electrical nerve stimulation and laser acupoint stimulation have attempted to popularize AP and to expand the populations benefiting from the treatment. However, one must be careful about over commercialization at the expense of efficacy. Consequently, it is essential for the medical community to undertake comprehensive studies to validate further the effectiveness and application of AP in both humans and animals. Such scientific exploration will play a vital role in enhancing our understanding of this ancient therapeutic method, and ultimately improve the quality of healthcare for individuals and animal patients alike (Gafarov, 2020; Zhang and Li, 2021; Zhang *et al.*, 2022a; Zhu *et al.*, 2021)

However, AP is not always a painless treatment, since injuries on the meridian can occur due to improper applications, and AP procedure can cause pain. The physiological effects of AP are linked to the aggregation of endorphins or monoamines, cortisol, increased lymph flow and that flow number, resulting in the endocrine effect on the target organ and calcinin discharges. AP also contributes to the release of essential P-substance and somatostatin roles in the gastrointestinal, expiratory and endocrine systems. The efficacy of AP can be performed under the appropriate conditions. Some of these are the animal's diagnosis, the theoretical therapy foundations, the success experience, the use of sterilized stainless steel needles, needle correct handling, and anatomy knowledge that allows AP points good recognition. It is important to ensure the practitioner has the necessary experience and expertise to deliver safe and effective treatment (Han *et al.*, 2021; Hobbs, 2020; Matos *et al.*, 2021).

### 3 CONCLUSION

According to the literature referred AP is an ancient CTM intervention method that involves inserting thin needles in specific acupoints on the skin to produce biological responses from the nervous system and is one of the most commonly used approaches to complementary medicine. Although AP use in animals has been practiced for thousands of years, scientifically based efficacy studies are still lacking in the research community.

In modern society, it is clear that the recognition of these AP points transcends culture and species, and has thus led to widespread interest and research in this area. This has not only reinforced

the ancient knowledge that comes with AP, but has also opened doors to further understand the impact and potential healing powers that exist within these vital points. With ongoing studies in the field of AP, the reach of its application continues to expand, positively influencing the health and well-being of both humans and animals. The ancient wisdom of AP is proving to be timeless and boundless, offering helpful insights into the intricate workings of the body and its interconnected systems.

Conditions as musculoskeletal pain, respiratory issues and metabolic disorders are the most frequent described AP treatments in veterinary practice. The dosage and frequency of AP sessions to maximize its benefits without risking adverse effects is crucial. With proper application, AP can be a valuable tool in treating various health conditions and promoting well-being.

Despite its potential benefits, it is important to consider potential risks and consult with a qualified veterinary before undergoing AP treatment. Safe and effective treatment requires careful consideration of the patient's medical history, conditions, current medications and sensitivities. Therefore, it is important to find a well-trained and experienced acupuncturist who can prioritize patient safety and deliver tailored treatment to address individual needs. However, it is vital to note that complications such as infection, injury or nerve damage may occur. Moreover, AP may potentially cause adverse events such as dizziness, fainting and increased pain.

Although being less-invasive and drug-free animal's treatment option, poorly trained acupuncturists may apply excessive force when inserting needles, leading to tissue damage. AP is not suitable for every animal and should avoid in pregnant or bleeding disorders, weakened immune system and history of seizures patients. An open communication with animal owners to discuss potential risks is crucial before starting AP. Acupuncturist's qualifications and experience is need to guarantee a harmless and effective treatment. Safety measures to ensuring any sharp or small objects are inaccessible to pets and caution when moving to avoid accidentally knocking over needles is vital. Post-treatment care include checking for allergic reactions and possible side effects such as minor bleeding, bruising or pain at the needle insertion site.

This literature review can contribute to researchers interested in this topic by organizing several references in order to discuss oriental ancient method in occidental academy, normally so skeptic about it. To improve studies in AP treatment effectiveness, future works comparing approaches in each domestic species, specific diseases and in different AP modalities, such as electroacupuncture and moxibustion, need to be carried out.



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