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COMMENTARY

What Is the Point? The Problem with Acupuncture Research That No One Wants to Talk About

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Abstract

Despite having made substantial progress in academic rigor over the past decades, acupuncture research has been the focus of long-standing and persistent attacks by skeptics. One recurring theme of critics is that the concept of acupuncture points has no scientific validity. Meanwhile, the subject of whether-or-not acupuncture points ''exist'' has been given too little attention within the acupuncture research community. In this article, we argue that failure to use clear terminology and rigorously investigate the subject of acupuncture points has hindered the growing legitimacy of acupuncture as an evidence-based therapy. We propose that a coordinated effort is needed to improve the use of terminology related to acupuncture points, combined with rigorous investigation of their ''specificity'' and possible biological basis.

Keywords: acupuncture, acupuncture points, methodology, anatomy

Introduction

Over the past two decades, high quality research on the efficacy and, above all, on the effectiveness of acupuncture for pain conditions compared to usual care has significantly enhanced the position of acupuncture in multiple pain guidelines and subsequent policy decisions.[1–4] This research includes individual trials,[5–7] patient-level meta-analyses supporting effect sizes on par with NSAIDs and beyond placebo control,[1,8] and cost-effectiveness studies.[9–12] Acupuncture can thus fairly be portrayed as having arrived at a new position of strength. This is a perfect time, then, to examine some research questions that are central to the field of acupuncture, but have remained mostly unaddressed and are standing in the way of further progress.

Ever since the 1970s when acupuncture began to be popularized in the West, acupuncture research has been the target of persistent and ongoing attacks by lay and academic writers who denounce its perceived lack of scientific credibility and dubious fundamental assumptions.[13–16] While such publicity has clearly not stopped acupuncture research in its tracks, we believe that it has affected the climate surrounding acupuncture research, and especially its acceptance among mainstream academic institutions. One recurring theme of skeptics is that the concept of acupuncture points has no scientific validity. Despite remarkable recent progress in basic and clinical research, the subject of whether-or-not acupuncture points ''exist'' remains largely avoided within the acupuncture research community. In our view, not examining this question is unfortunate as it may inadvertently reinforce the impression that acupuncture's critics are exposing an irritating kernel of truth. Equally important to us, it leaves unexplored fundamental questions about acupuncture's foundations, which may influence the design, conduct, and interpretation of future research.

In this article, we argue that lack of clear terminology and rigorous investigation of the subject of acupuncture points is limiting acupuncture research, quite likely with ramifications for access and uptake by mainstream healthcare. We urge the exploration of these basic issues amidst the ambiguity of knowing that, in another part of the evidence house, research on acupuncture is already supporting expanded use with significant benefits to patients.

Confusion in Basic Definitions: What Is in a Name?

A quote attributed to Confucius is that ''the beginning of wisdom is to call things by their proper name.'' As a first step toward mapping out a research agenda to resolve issues related to acupuncture points, we begin by examining how terminology has created ambiguity and confusion. We start with the term ''acupuncture'' itself. The Society for Acupuncture

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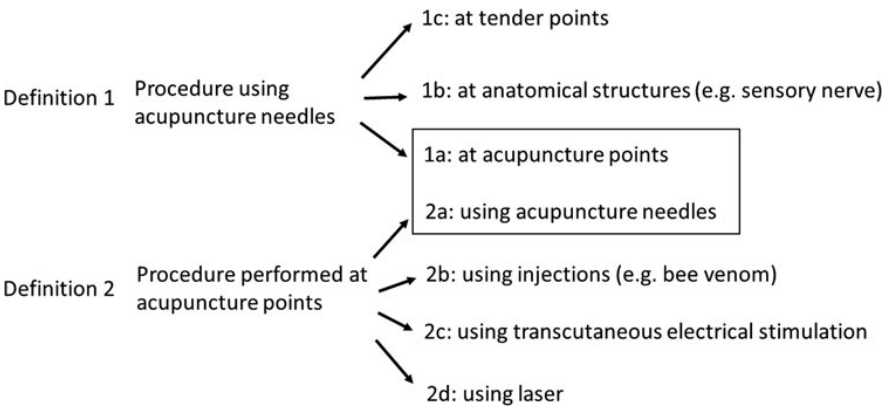

FIG. 1. Contrasting definitions of the term ''acupuncture'' as a procedure performed with an acupuncture needle, or at acupuncture points.

Research has addressed this starting point in two related White Papers. These discuss how the word ''acupuncture'' is used interchangeably to designate both (1) a complex multicomponent *treatment*, including history taking, physical examination, diagnosis, and education, and (2) a *procedure* involving various types of local tissue stimulation, including manual and electrical methods.[17,18]

While these White Papers were a good start, they only addressed part of the definition problem. Confusion around what is meant by ''acupuncture'' goes deeper. This is because the acupuncture procedure itself continues to be defined in two fundamentally different ways. The first (Fig. 1, Definition 1) describes something that one does *with an acupuncture needle*. In this definition, an acupuncture needle can be inserted at (1a) traditional locations defined in acupuncture textbooks (i.e., acupuncture points); (1b) locations defined by anatomical structures without reference to traditional acupuncture points (e.g., sensory nerve); or (1c) locations that are tender to palpation. The second use of the term acupuncture (Fig. 1, Definition 2) is to describe a procedure that one does *at an acupuncture point*. In this second definition, the procedure may be (2a) the insertion of an acupuncture needle; (2b) the injection of a substance (such as bee venom); or (2c, d) the use of something else such as transcutaneous electrical stimulation or laser. According to Definition 2, as long as the intervention occurs at an acupuncture point, the procedure can be described as acupuncture. While Definition 1, defined by the use of acupuncture needles, does not require the existence of acupuncture points, Definition 2, defined by the use of acupuncture points, totally depends on it. These two ways of defining the procedural aspect of acupuncture have coexisted for so long with so little debate that they are essentially ''bleeding into'' one another. Thus, the concept of acupuncture points permeates the entire field, including types of acupuncture within Definition 1 that do not require it. We must begin with clarity in what exactly we mean each time we use the term.

Using Acupuncture Points as Anatomical Shorthand

Acupuncture points are used ubiquitously in research protocols, even though the concept may not always be necessary for the research question that is being asked. For example, some basic science studies use acupuncture needles to manually or electrically stimulate peripheral sensory nerves,[19,20] autonomic nerves,[21] or muscles.[22] In such cases, the term ''acupuncture'' refers to a procedure using an acupuncture needle that targets an anatomical structure (Fig. 1, Definition 1b). Yet, even in such studies, researchers often use acupuncture points in their method description. While the intent may simply be to establish the ''latitude and longitude'' of the physiologic target, using the acupuncture point terminology suggests that choosing a needling location that is an acupuncture point is important for the outcome of the experiment. However, it is usually not clear whether the same, or a different, result would be obtained if a nearby ''non-acupuncture point'' had been needled instead.

The most commonly stated explanation for using traditional acupuncture points in basic science experiments is to preserve the clinical relevance of the studied intervention. In other words, without the traditional terminology, the relationship of the procedure to the larger acupuncture diagnosis and multicomponent treatment ritual may be lost. However, framing the inquiry by using the traditional point location technique may limit the question to a narrower frame than the subject may warrant, and miss an opportunity for building bridges to the mainstream academic community.

Another, little-discussed explanation for referring to acupuncture points in such research is that point names have become a useful shorthand for communication among acupuncture researchers as well as clinicians. If one thinks about acupuncture points as a set of anatomical locations that have one or more useful features, such as the proximity to a large mixed nerve,[23,24] the motor point of a muscle,[25] or the intersection of two or more fascial planes,[26] this makes sense. For example, describing an anatomical location as ''PC6'' (Pericardium 6 or Nei Guan) is convenient compared with ''*on the anterior surface of the forehand, between the tendons of the palmaris longus and flexor digitorum longus, two anatomical units proximal to the wrist*.''

In this ''anatomical shorthand'' capacity, acupuncture points can be useful without necessarily having special common attributes that collectively distinguish them from ''non-acupuncture points.'' Using acupuncture points as anatomical locators in this way has been successful in some studies to demonstrate that needling at different anatomical locations does produce different effects.[27–30] In this context, the term acupuncture point ''specificity'' is sometimes used

to mean that certain physiological effects are observed when needles are inserted *at specific anatomical locations*, without implying that the locations are defined by anything more than proximity to a sensory nerve.[31] However, using the term ''acupuncture point specificity'' in this way is confusing, as it appears to mean that the effect would not be observed at locations that are not acupuncture points.

The Point and the Point Within the Point

Many acupuncture clinicians and researchers would argue that the ''anatomical shorthand'' definition is not the only motivation for preserving the concept of acupuncture points. This is partly due to an underlying assumption that acupuncture points are collectively different from ''non-acupuncture points.'' In this context, the term ''acupuncture point specificity,'' based typically on foundational texts and teachings, implies some special attribute shared by acupuncture points in general, which underlies the biological basis of acupuncture. The research question of course is ''What could this common attribute be?''

Here, it is important to note that, in making the argument for acupuncture point specificity, acupuncturists and researchers will again introduce an additional level of ambiguity. In practice, the term acupuncture point is used in two different ways. One is to describe a general area based on anatomical landmarks found in acupuncture textbooks (e.g., the above shorthand definition for PC6). The other is to describe a discrete ''point'' in the general vicinity of the designated anatomical area for PC6, yet with an exact location that varies, contingent on local tissue qualities, and may change over time within a person. Acupuncturists describe feeling for a specific punctate (a few millimeters in diameter) location where tissue qualities such as texture, stiffness, moisture, or temperature are different compared with surrounding tissues. One of the skills taught during acupuncture training is the ability to detect these subtle tissue differences, finding these ''points within the points,'' and insert the needle at the correct location. For clarity, in the remaining of this article, we will use the term ''anatomical location'' to refer to the anatomical description of acupuncture points (e.g., PC6 anatomical description above) and ''point'' to refer to the palpable entity.

So far, no anatomical, histological, or biochemical measurements have conclusively demonstrated systematic differences between palpable ''points'' and ''non-points.'' Attempts have been made to measure various structures or cells (e.g., nerve fibers and mast cells),[32–34] or chemicals (e.g., nitric oxide metabolites and calcium)[35,36] at acupuncture points. A hypothesis proposed some decades ago, based on observations in cadavers, was that the small palpable depressions may correspond to gaps in the superficial fascia where neurovascular bundles travel perpendicularly through the fascia toward the skin.[37] So far, however, none of these studies has measured the density or concentration of any given structure, cell type, or chemical at sufficient numbers of acupuncture points compared to matched non-acupuncture point locations within the same body region. Thus, these existing studies do not provide the kind of evidence that can be applied to acupuncture points in general.

Although this is not much discussed in research, acupuncturists and shiatsu practitioners often talk about feeling ''energetic'' differences between acupuncture and non-acupuncture points, in addition to, or instead of, feeling for physical tissue characteristics such as tissue stiffness. Acupuncturists are taught to palpate tissues until they feel a tactile ''connection'' to the patient. This is thought to be enhanced at acupuncture points and relate to the ''de qi'' sensation that patients, and sometimes practitioners, experience during needling. Verbal feedback from the patient is often also helpful, and collaborative communication adds a dimension to the intervention by further reinforcing the patient-practitioner relationship. The notion that acupuncture points should be defined ''energetically,'' rather than anatomically, is controversial. This concept is linked to the idea that acupuncture points could correspond to areas of decreased electrical resistance compared with surrounding tissues, likes nodes on an electrical grid. This was based on striking ''bullseye'' drawings published in the 1970s, but has not been confirmed by any rigorous quantitative controlled study.[38] Although there has been recent progress in understanding endogenous energy fields in humans,[39] attempts to relate these phenomena to acupuncture points and meridians have had methodological pitfalls similar to those of histological and biochemical studies.[40]

Challenges Related to the Concept of Meridians

The traditional concept of acupuncture ''meridian'' has contributed to the confusion and controversy on the subject of acupuncture points. Acupuncture meridians are typically represented in acupuncture charts as lines on the surface of the body that link acupuncture points with one another. However, acupuncture points are not exclusively located along meridians. Indeed, the number of acupuncture points described in the various available acupuncture textbooks tends to be quite ''elastic,'' depending on whether one includes a wide variety of ''extra'' points located off the meridians. Totals can range from the hundreds to over a thousand.[41,42]

Acupuncture meridian lines are mostly longitudinal and tend to lie over tissue planes between muscles, sometimes following the course of peripheral nerves, but oftentimes not.[26] Classical acupuncture theory holds that meridians are pathways through which ''qi''—variably translated as ''life force,'' ''energy,'' ''transformation,'' ''movement,'' or ''information''—flows. Although the origin of the meridian maps is unknown, modern texts describe the ''propagation'' of de qi sensations centrally or distally away from the site of needling.[43] It is possible, although speculative, that ancient empirical observation of the paths taken by these propagated sensations gave rise to the meridian maps. Although meridians are usually represented as lines on the surface of the skin, it has been proposed that the surface lines are a simplification of a more complex three-dimensional network, including ''tendinomuscular'' or ''fascial'' structures.[26,44,45] However, even if acupuncture meridians were to represent a three-dimensional network, it is still not clear why certain ''points'' along them might have special properties or functions. An acupuncture point could be located where it is in acupuncture textbooks because (1) it is located along an anatomical structure such as an intermuscular fascial plane that contains a sensory nerve and (2) it corresponds to a location within this structure that is particularly accessible

and safe to needle. This postulation has not been confirmed, but could be tested by comparing the physiological (including adverse) effects of needling at various locations along a fascia plane and/or nerve, some corresponding to acupuncture points and some not.

Acupuncture Points in Basic Research

Meanwhile, the term acupuncture point ''specificity'' continues to be used ambiguously in basic acupuncture research to describe both the effects of needling at prescribed anatomical locations (using the shorthand definition), and to describe putative attributes of acupuncture points in general (compared to non-acupuncture points). It is therefore not surprising that acupuncture critics continue targeting acupuncture points as a major weak link in arguments for taking acupuncture, and acupuncture research, seriously.

Lack of precision in the design of acupuncture experiments further contributes to perpetuating the confusion surrounding acupuncture points. Experiments attempting to test whether ''verum'' acupuncture points have specific physiological properties compared to ''sham'' acupuncture points typically confound the following anatomical levels: body region (e.g., head, arm, and abdomen), anatomical location (e.g., PC6 anatomical description), and ''point'' (e.g., small depression palpable on the skin in the vicinity of an acupuncture point location). If one wants to test whether needling of a small palpable ''point'' differs from a ''non-point,'' one must compare the two conditions within the same anatomical location (Fig. 2A). For example, comparing a palpated ''point'' near PC6 with a palpated ''non-point'' near L6, would confound ''point versus non-point'' with anatomical location (in this case anatomical locations would differ with respect to proximity vs. lack of proximity to a major sensory nerve) (Fig. 2C). Likewise, if one compares two anatomical locations (e.g., PC6 vs. L6), it should be within the same general body region (e.g., forearm) (Fig. 2B). Comparing an acupuncture point on the arm with another acupuncture point on the abdomen confounds anatomical location with body region (in this case, body regions would systematically differ with respect to subcutaneous tissue thickness, fascia, and muscle depth) (Fig. 2D).

It is also obviously important that other potentially confounding variables such as needle stimulation method and insertion depth are kept consistent, or at least adjusted relative to confounding factors such as muscle depth.[17,18] However, the literature abounds with basic animal and human studies reporting differences between the effects of needling at an acupuncture point location within one body region (e.g., arm and head) compared with another acupuncture point location in a different body region (e.g., abdomen), and concluding that the effects are ''acupuncture point specific.'' One also finds studies comparing an acupuncture point location in one body region with a non-acupuncture point location in a different body region, which is even more confounded (Fig. 2E). Researchers have also used different needling methods across acupuncture and non-acupuncture compared sites. These issues become even more problematic when evaluating acupuncture points in small animals, especially rodents where acupuncture points and meridians are so close together that identifying a ''non-acupuncture'' point becomes a meaningless exercise (research in large animals, such as dogs and pigs, is important to overcome this problem). It is important to note that, while the use of ''sham'' points can play a valuable role in human and animal basic research to control for attention or random puncturing of the skin, these controls do not necessarily address the issue of point specificity.

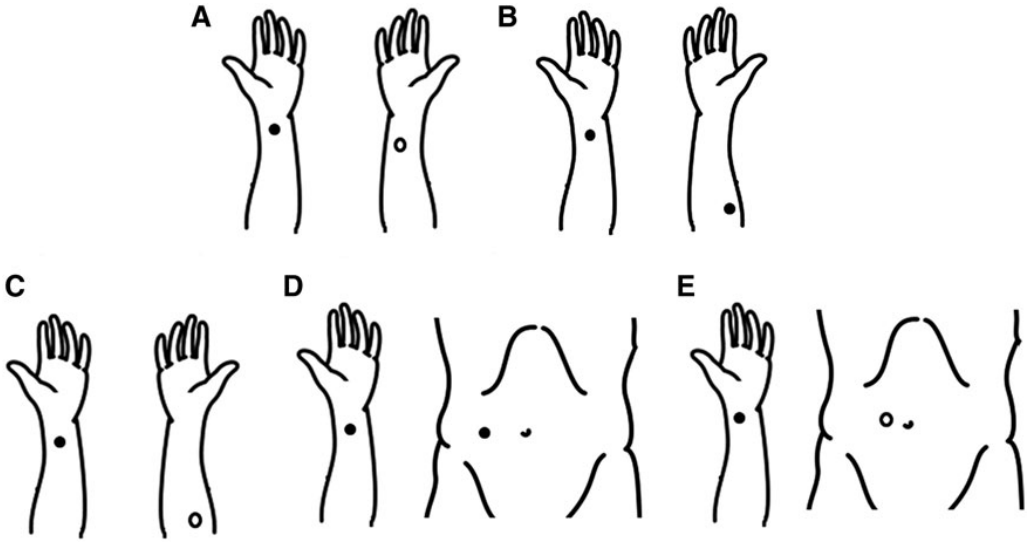

FIG. 2. Examples illustrating nonconfounded **(A, B)** and confounded **(C–E)** experimental designs. **(A)** Nonconfounded design comparing point type (acupuncture point vs. non-acupuncture point) within the same anatomical location. **(B)** Nonconfounded design comparing anatomical locations within same body region. **(C)** Design confounding point type and anatomical location. **(D)** Design confounding anatomical location and body region. **(E)** Design confounding point type, anatomical location, and body region. *Closed* and *open circles*, respectively, denote ''acupuncture'' and ''non-acupuncture'' point locations.

Acupuncture Points in Clinical Research

In clinical trials, the question of acupuncture point specificity is further intertwined with complex issues related to acupuncture's efficacy versus effectiveness. We and others have previously argued that, because of the multicomponent nature of a typical acupuncture treatment, testing the clinical efficacy of needle-specific intervention components is very difficult, and not necessarily clinically relevant. Rather, we advocate for studies evaluating the overall effectiveness of treatments.[17] Nevertheless, clinical trials suffer from confusion regarding what conclusions can be drawn from them regarding acupuncture point specificity. Commonly used clinical trial designs test multiple acupuncture points in their verum arm, while the sham intervention consists of varying combinations of nonpenetrating needling at true acupuncture points, penetrating (full depth or shallow) at non-acupuncture points, or acupuncture points not considered indicated for the condition being treated. A recent review found that acupuncture outperformed shams for all types of sham controls when tested for chronic pain conditions,[8] including comparisons of acupuncture and non-acupuncture points. However, as with basic research studies, these clinical trials have confounded point type (acupuncture and non-acupuncture points) with either needle depth (superficial vs. deep) and/or needling technique (stimulation vs. no stimulation). Such a design increases the likelihood of finding differences between verum and sham groups, and is appropriate when the goal of the sham is simply to control for nonspecific effects such as attention and expectancy as discussed above. However, the results of these clinical trials should not be used to infer anything about point specificity.

A Path Forward

How do we move on from here? First, we believe it is imperative for the notion of ''acupuncture point specificity'' to be unpacked and clarified. A good place to start would be to recognize both the utility AND the liability of the acupuncture point concept. As outlined above, the existing literature suggests that using the acupuncture point nomenclature as shorthand can be useful by facilitating communication among acupuncture researchers and, importantly, between researchers and clinicians. However, this acupuncture nomenclature, although convenient, can deter researchers outside the acupuncture research community from appreciating the broad significance of the work. Thus, clarifying the usefulness, or lack thereof, of acupuncture points as ''anatomical shorthand'' will require answers to two different, but related questions: (1) can specific physiological effects be demonstrated to occur exclusively when a needle is inserted at a certain anatomical location or combination of locations? If so, (2) what is the most useful nomenclature for these locations?

For example, if similar results are obtained when needling anywhere on the abdomen, or along the course of a nerve, then describing a procedure as ''acupuncture needling on the abdomen'' or ''acupuncture needling along the median nerve'' would be more helpful to the broad scientific community than ''acupuncture needling at ST 25 or PC6,'' which seems to imply that needling at a specific ''spot'' is important. While this may admittedly be challenging to the acupuncture profession, continuing to refer to acupuncture points in such circumstances would unnecessarily confuse readers, detract from the scientific findings, and ultimately limit the integration of acupuncture research findings in our overall understanding of human health.

Dropping the acupuncture shorthand nomenclature in favor of more universally understood anatomical descriptions would improve the accessibility of acupuncture research to the general scientific community. This trend has already begun in ear acupuncture research, where articles increasingly refer to the auricular concha, or area of the ear innervated by the vagus nerve, rather than specific auricular acupuncture points.[46] A potential drawback of dropping the shorthand acupuncture point nomenclature, however, is that it could fracture acupuncture research into ''camps'' and dissociate modern ''western'' from more traditional ''eastern'' researchers. Whether or not the anatomical shorthand nomenclature continues, experiments using these locations should carefully control for body region, needle depth, and proximity to major sensory nerves and anatomical structures such as ligaments and joint capsules. Positive findings in such experiments would indicate that some of the locations described in acupuncture textbooks (those that are tested) are useful to identify biologically sensitive locations on the body where stimulation (using a needle or other method) produces a certain physiological effect.

It is interesting to note that, compared with clinical practice, the range of acupuncture point anatomical locations used in acupuncture research is quite narrow, with the same anatomical locations (e.g., PC6, ST36) used repeatedly in a large number of studies. It would be important to determine whether such acupuncture point locations belong to ''special'' subsets of biologically active anatomical locations, which could grow over time as research evolves. For example, subsets of acupuncture point locations could be defined based on recognized anatomical features (e.g., proximity to large mixed nerve) or consistently demonstrated physiological effects (e.g., lowered blood pressure, increased gut peristalsis, and change in activation of specific brain structure). If so, a special lettering convention (appended to the acupuncture point name, for example PC6*) could indicate that the point belongs to one or more subsets, which could be further defined in a generally accessible data repository. Eventually, this approach could be extended to testing clinical effects (e.g., reduced headache or knee pain), although this may be more difficult due to the greater variability in responses to be expected when testing patients with various clinical conditions, compared with healthy volunteers. Identifying special acupuncture point subsets would not negate the concept of acupuncture points in general, which would need to be examined separately as outlined below, but would build a case for continuing to use the shorthand nomenclature.

It is important to stress that experiments comparing anatomically defined acupuncture point locations with one another would not test whether palpable ''points'' in general have common properties. To do this, ''points'' need to be compared with ''non-points'' *in the vicinity of the same anatomical location*. This is methodologically challenging, because of the boundary constraints for locating non-points imposed by the distance between adjacent acupuncture points and meridians, which is typically of the order of a few centimeters in humans (millimeters in small animals). One

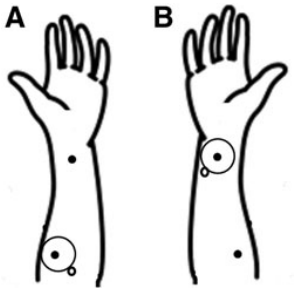

FIG. 3. Example illustrating randomized method for comparing pairs of palpable ''points'' and ''non-points'' within the same anatomical location. *Open* and *closed circles*, respectively, denote points and non-points. The same points are located by palpation at the same anatomical location bilaterally. Body side is then randomized to point versus non-point. The non-point is then marked at a certain fixed distance (e.g., 1 or 2 cm) and orientation relative to the palpable point.

way to address this challenge is to compare a point with a corresponding non-point on the other side of the body (Fig. 3). This can be done objectively by locating and marking the location of the same point bilaterally, based on both anatomical location and palpation, then randomize the right and left sides to point and non-point. On the side randomized to non-point, the needling location can be marked a certain constant distance away (e.g., 1 or 2 cm medial or lateral) from the palpable point.[47] This method can be applied to *in vivo* as well as postmortem anatomical studies. In either case, this process needs to be repeated with as many pairs of acupuncture and non-acupuncture points as possible, heavily replicated within and across subject, and evaluated using appropriate statistical methods that account for within- and between-subject variability.

A critical consideration in such studies will be the likely need for very large samples to overcome anticipated variability and to be able to detect true biological signals from noise. So far, most experiments designed to measure differences between points and non-points have lacked this type of statistical rigor. There is therefore a need for methodologically sound studies with sufficient statistical power to determine whether palpable points are collectively different in some measurable way from non-points. Until then, it would behoove the acupuncture research community to acknowledge that this notion remains hypothetical until it is definitively proven.

Call to Action

Acupuncture, while ascending in its usage and inclusion in various delivery environments, continues to receive a good deal of bad press, especially in the academic research community. We believe some of it is warranted for reasons described above, and summarized here as follows: (1) the use of confusing terminology that embeds the concept of acupuncture point within the definitions of acupuncture; (2) the ambiguous definition of acupuncture points to designate both an anatomical location and a discrete palpable structure; and (3) the collective failure of the acupuncture research community to critically evaluate the concept of acupuncture point specificity.

We therefore propose that as a first step, it is essential to ''clean up'' the assumptions and language used in acupuncture research surrounding acupuncture points. This will minimize confusion, inform the design of rigorous research, and defuse some of the criticism directed at the acupuncture research community. A coordinated campaign is needed to target the improved use of terminology related to acupuncture points, combined with rigorous exploration of their ''specificity'' and possible biological basis.

We also argue that this effort will need to begin with basic science experiments that can isolate point type (i.e., acupuncture and non-acupuncture point, either defined by anatomical location or anatomical location and palpation) as an independent variable that can be tested. This must be done by comparing individual, or small groups of, acupuncture points against their appropriate controls. This approach will be best suited to experiments in which measured outcomes are physiological measurements (e.g., change in blood pressure or hormone level, activation of specific brain area) rather than overall clinical effectiveness. Technological development of new and more sensitive measuring instruments will enhance this endeavor. Incorporating a recommendation for appropriate language to define the term ''acupuncture point'' into guidelines for the design and reporting of acupuncture clinical trials[48] would also help move the field forward. Thus, the translation of knowledge gained in basic physiological experiments into protocols for clinical trials, and eventually clinical practice, will take some time. Yet, the overall effort to address the issue of acupuncture point specificity will likely lead to improved funding and publication success, and advancement of the status of acupuncture as a legitimate evidence-based therapy worldwide.

The arc of science has proven that, as we continue to refine and evolve our understanding of the body, our understanding of treatment mechanisms moves alongside with it. One of the oldest drugs, aspirin, has undergone several mechanistic and clinical ''rebirths'' as our understanding of immune responses has evolved over time. It is possible that the concept of acupuncture point specificity will turn out to be a ''false'' notion. On the other hand, a well-designed research agenda may identify clearer associations of acupuncture points with already established anatomical and/or biological phenomena, or with structures, physiological or biophysical processes we do not yet fully comprehend, or currently have the tools to measure. In fact, investment in prior acupuncture research has led to multiple unanticipated findings that have significantly impacted many disciplines of biomedicine, including brain neuroplasticity, connective tissue biology, and placebo responses.[49] Regardless of outcome, a more critical and rigorous examination of acupuncture points will not undermine the effectiveness of acupuncture demonstrated in recent trials. If anything, biological clarity will inform optimal study design, and may lead to interventions demonstrating greater effectiveness and cost-effectiveness in future clinical studies, thus resulting in additional clarity for policy makers regarding plans for access and inclusion.

These directions will challenge the clinical acupuncture community to engage in deep self-reflection, as well as expanded dialogue with researchers. In this renewed

engagement, acupuncture researchers need to be proactive, unified, and vocal about addressing the confusion surrounding acupuncture point specificity if it is to have an impact on critics, even though examining a belief so intertwined in the definition of acupuncture will no doubt be difficult. Because of the complexity of the issues involved, a multidisciplinary approach will be needed, including acupuncture clinicians and scholars of traditional East Asian medicine, anatomists, physiologists, and biophysicists. We hope this article will stimulate a discussion, including a plurality of perspectives. The intent should not be to ''placate'' critics, but to take a good honest look at the issues, recognize their importance, and address them systematically with the goal of strengthening acupuncture's foundation.

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