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# Overview of Collateral Meridian Therapy in Pain Management: A Modified Formulated Chinese Acupuncture

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## 1. Introduction

The Western approach to pain management is focused on the use of pharmacotherapy, physical therapy, nerve blocks, nerve ablations, implantable devices. Even though increasing of understanding of the mechanisms of pain for the treatments; some pains remain intractable (Hariharan et al, 2007; Wagner et al, 2007; Laxmaiah et al, 2009). In contrast, traditional Chinese medicine (TCM) centres primarily on the energy relationship among the environment and the body and organs, without a clear understanding of pathophysiology or the mechanisms of diseases and its effects are varied and inconsistent. The collateral meridian therapy (CMT), offers an alternative treatment for different types of pain by taking a systematic approach to a variant of traditional Chinese acupuncture (TCA). Here, we highlight the recent development of CMT by describing the main theory, discussing the differences between CMT and TCA, defining abbreviations associated with CMT, explaining acupoint localization principles, and providing clinical reports for application in pain management.

## 2. The theory behind CMT

To achieve an understanding of CMT, it is necessary to revisit the modality on which it is based. In TCA, it is believed that the manipulation of certain points on the skin can affect the movement of energy, or “Qi”, throughout the body. It is assumed that “Qi” flows in channels, or meridians, along the body, and that good health is maintained through balancing the circulation of Qi along these channels. In TCA, there are 12 established meridians. On these 12 meridians, a total 361 acupoints are located through which the flow of Qi can be manipulated. The selection of points for treatment, following the “one-needle effect”, where therapeutic effect is obtained from manipulation of one strong acupoint, is based on the nature of the disease treated as defined by the five-element theory of TCM, and by a number of personal factors. As a result, the treatment for disease is changed on a case-by-case basis. There has no standard method; the effectiveness of TCA varies from patient to patient.

In CMT, however, two acupoints are manipulated, instead of one. The meridian lines are the same as in TCA, but each meridian has only nice standard acupoints (a total of 108). Two acupoints are used for redirection the flow of Qi from one meridian to another. As such, in CMT, the points selected for treatment are commonly on non-diseased meridians. CMT also follows the use of a standardized set of protocol for treatment, instead of the individual varied treatments given in TCA. The two points manipulated are known as control C-point and functional F-point. These points are specific to each meridian and allow the flow of Qi to be linked from the diseased meridian to a healthy one.

2.1 Two-point theory: C-point and F-point

The C-point is used to connect the diseased meridian and the healthy meridian. In treatment, practitioners manipulate the healthy meridian to relieve the pain or symptoms. Obstructed energy Qi is allowed to flow from the lesion site to the unobstructed healthy meridian, through which the disease will be discharged. Each meridian has its own C-point. For the location of C-points, please see figures 1 and 2. For the abbreviations and anatomical definition of C-points, please see table 1. The C-point is for linking the diseased meridian to the treatment meridian, and the F-point is for the treatment of the disease symptom or painful location. The F-points in the different regions of the body are shown in figure 3. Each region of pain or disease in the body is represented by its own F-point. For instance, if the patient had pain in the neck of shoulder, the practitioner should select “a” as an F-point for treatment (Fig. 3). If a patient has an acute lumbar strain, the F-point over the lumbar L4-5 region would be “4”; the F-point over the lumbar L3-4 region would be “5” (Fig. 3).

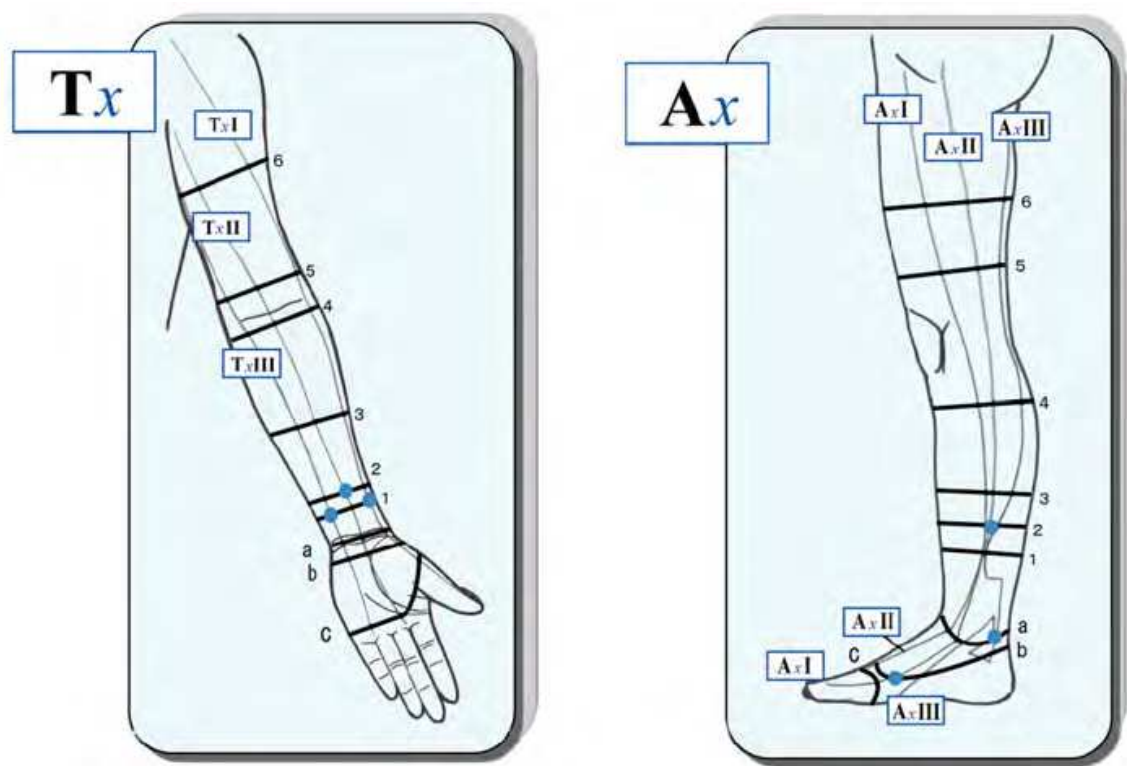


Fig. 1. The numbers 6, 5, 4, 3, 2, 1 and letters a, b, c are the treatment function points of six yin meridians. The blue points indicated control-point of each yin meridian (1, 2, and 1 for TxI, TxII, TxIII; b, 2 and a for AxI, AxII, AxIII).

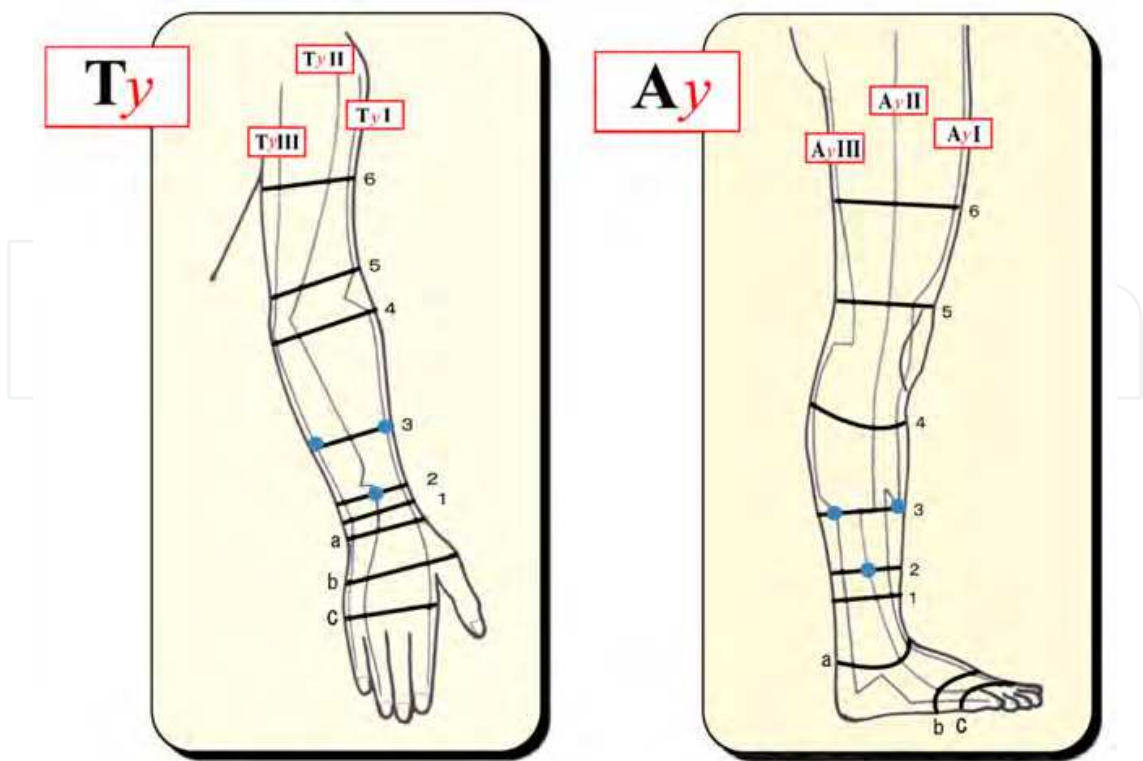


Fig. 2. The numbers 6, 5, 4, 3, 2, 1 and letters a, b, c are the treatment function points of six yin meridians. The blue points indicated control-point of each yang meridian (3, 2, and 3 for both TyI, TyII, TyIII and AyI, AyII, AyIII).

2.2 Abbreviations in CMT

The abbreviations used in CMT are defined as follows: “T” represents the upper extremity (Te is the pronunciation of “arm” in Japanese); “A” represents the lower extremity (Ashi is the pronunciation of “leg” in Japanese); the roman numerals, I, II and III represent the meridians on the radial, median and unlar side of the upper extremities, and the meridians on the anterior, medial (or lateral), and posterior aspect on the lower extremities, respectively. The use of “x” symbolizes the yin aspect, and use of “y” denotes the yang aspect of the extremities. Each extremity had nine acupoints in which point a, b and c are located on the hand or foot, and point 1 to 6 are located on the arm or leg (Figs. 1 and 2). The letters “r” and “l” represent the right and left side of the limb, respectively. For example, “lTyI” describes a meridian on the dorsal aspect (y) of the radial side (I) of the left (l) upper extremity (T) (see Fig. 8a).

2.3 How CMT identifies the diseased meridian and formulates a treatment protocol

For the purpose of simplicity, the symbols “/”, “()” and “.” are used to describe diseased or treatment meridians. For example, if the diseased region is over the right wrist (corresponding to “a”, Fir. 3) of the TyI meridian, it is represented by rTyI/a. If the treatment meridian selected is lTxI/1:a, then constant pressure is applied on the C-point “1’ of the lTxI meridian (Fig. 1), while a “remove” manoeuvre at the corresponding “a” point is simultaneously performed on the lTxI meridian. The letter “1” before “:” signifies the C-point of the lTxI meridian, while the letter “a” after “:” expresses the F-point “a”. T denote a supplement or enhancement manoeuvre, place “()” around “a” to make the treatment

formula  $lTxI/1:a$ ); otherwise, “a” without “()” represents a removal manoeuvre on point “a”. When there is no need to use the C-point, the symbol “0” is used for the treatment meridian. Examples of cases where no C-point is used included yin to yin or yang to yang meridians for namesake (T-A) links, or for the original meridian manipulation. Therefore, the colon symbol “:” is used to differentiate the diseased from the treatment meridian because only the presence of an F-point on the diseased meridian is necessary.

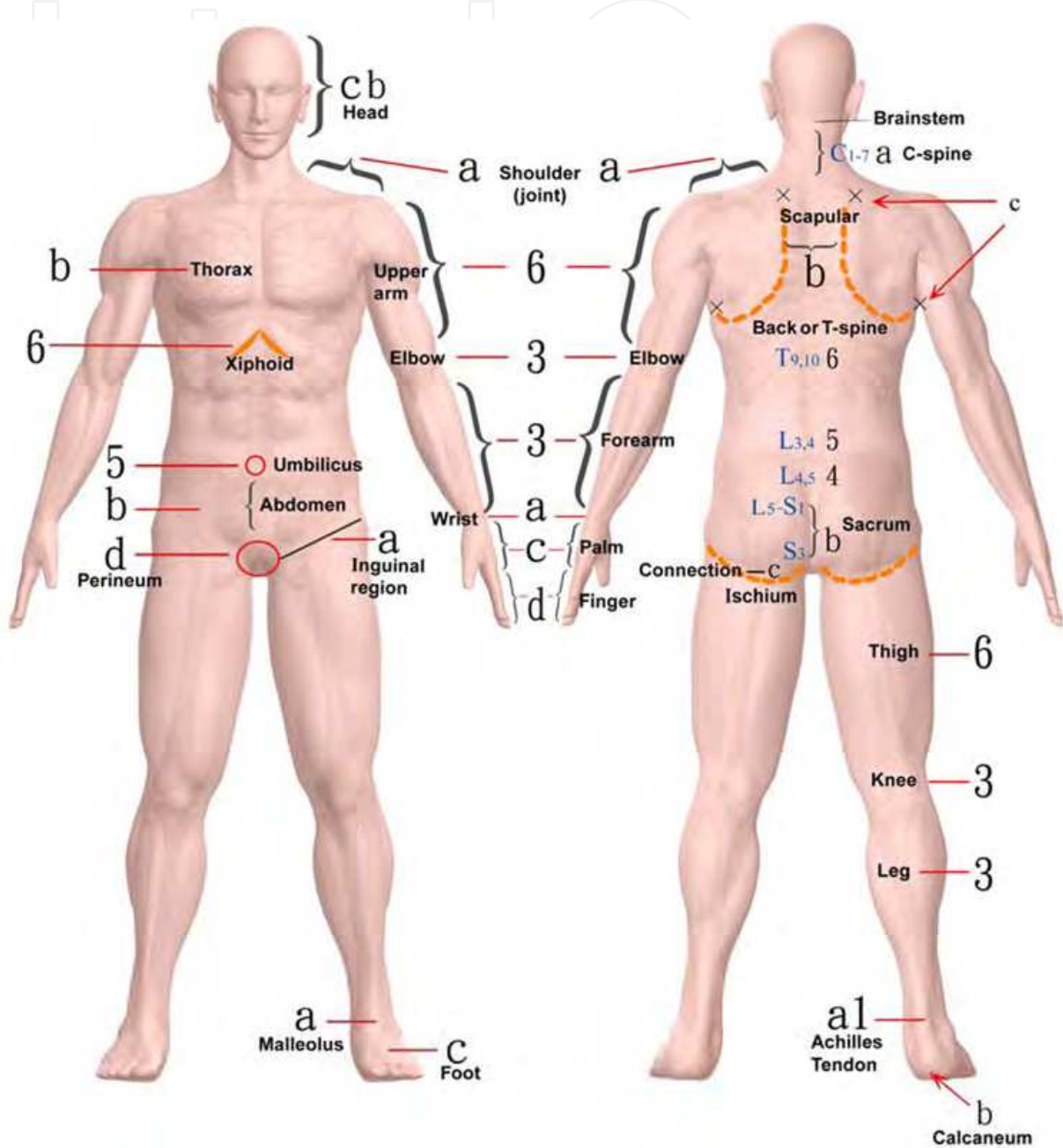


Fig. 3. This figure indicates specific body regions corresponding to F-points. The unique “d” system, different from the ordinary 9-point (6, 5, 4, 3, 2, 1, a, b, c) system on the treatment meridians, corresponds to intracranial, perineum and digits. al: the most painful point between point-a and point-1 on the treatment meridian, ac: the most painful point between point-c and point-b on the treatment meridian.

2.4 How CMT links to channel Qi and diverts the body flow in the meridians

The C-point ensures the link to channel Qi from the diseased meridian to the healthy one. Four different types of links are available to channel Qi: 1) Zang-Fu (TA-xy). 2) Exterior-Interior (x-y), 3) Namesake (T-A), and 4) Original meridian links (Fig. 4). The selection of treatment from the diseased meridian is shown in Figure 4. Zang-Fu (TA-xy) is the most common link for treatment. For example, if the diseased meridian is AxI, the treatment meridian is TyIII (TA-xy link) and vice versa. The determination of the treatment meridian, whether ipsilateral or contralateral, is based on the location of the lesion, as shown in Figure 5. For example, if the diseased meridian is rAyI, the treatment meridian is TxII (according to the TA-xy link in Fig. 4). Figure 5 shows that the treatment side for the TxII meridian is contralateral side to the diseased meridian; thus the left side is selected as the treatment side. Figure 6 illustrates the usage of the C-point to link the diseased meridian (rAyI) to the lTxII meridian by the TA-xy link (visceral Zang-Fu link) for treatment, acting as an area of energy discharge. By simultaneously manipulating the C-point and the F-point that corresponds to the painful site, the pain in rAyI will flow to lTxII, and the pain will be removed or reduced by manipulating the functional F-point pressed against the body flow direction (yin meridian). Similarly for the lAyIII or rAyIII problem in post-regional anesthesia/analgesia backache, the treatment meridian will be chosen as rTxI or lTxI (Yeh et al, 2009). Most acupoints are located along the edge of the bony shaft or on the tendinomuscular grooves. The accurate localization of the acupoint can be achieved through patient reports of soreness or painful sensation when the area is pressed deeply. For detailed anatomical localization of acupoints, please refer to 10b, and book by Ko and Chao (2007).

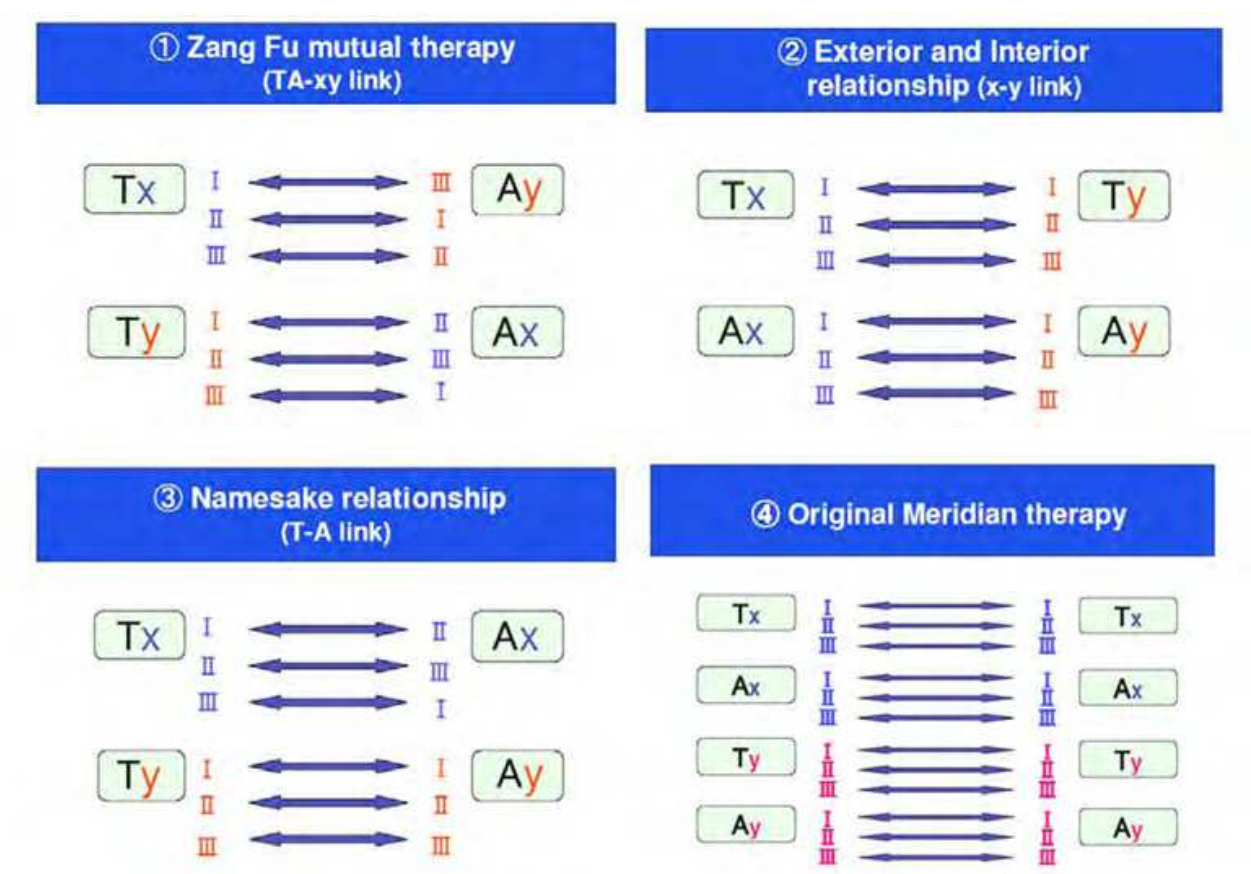


Fig. 4. The four types of links used to choose the treatment meridian.

	Yin (x)		Yang (y)	
T Upper limbs	I	contralateral	I	contralateral
	II		II	
	III	ipsilateral	III	
A Lower limbs	I	contralateral	I	ipsilateral
	II		II	
	III		III	

Fig. 5. Determination to choose contralateral or ipsilateral side of treatment meridian. For yin meridians used as the treatment ones to divert the obstructed flow, all of them must choose the opposite side to the diseased meridian, except for TxIII. On the other hand, for yang meridians used, all must choose the same side as the diseased meridian, except for TyI.

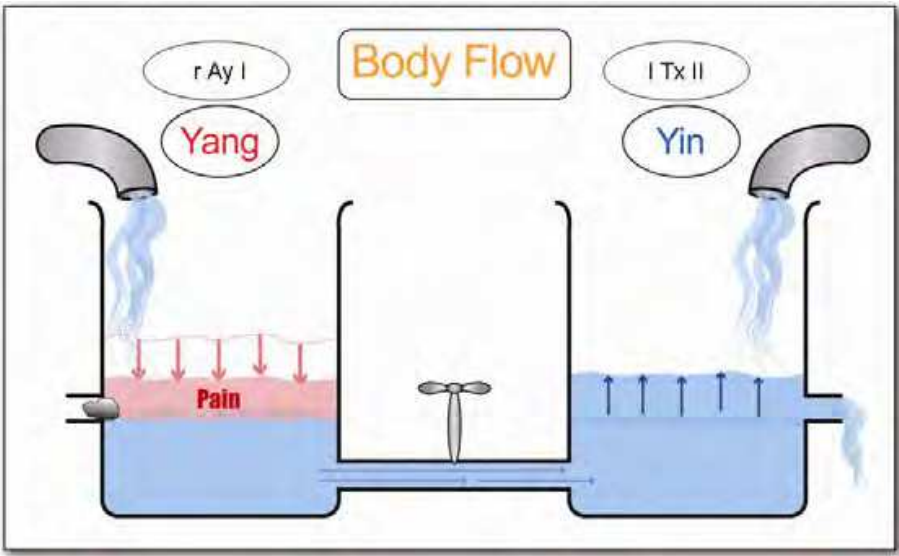


Fig. 6. Illustratin of the proposed mechanism of pain reduction.

2.5 Clinical reports for application in pain management

Case studies have shown the effectiveness of CMT on the treatment of intractable pain (Wong et al, 2006). Patients suffering from intricate chronic pain, such as post-herpetic neuralgia and complex regional pain syndrome, are responded dramatically to the CMT treatment (Wong et al, 2007). Moreover, CMT is also observed effectively on local musculoskeletal pain that resulted from such injuries as sprains or strains and demonstrated positive effect on shoulder pain relief after laparoscopic surgery (Yeh et al, 2008). CMT is also an effect technique to reduce painful dysmenorrhea (Lin et al, 2010). Moreover, CMT is also highly effective in the treatment of post-neuraxial block backache in patients who were failed to treated by the conventional treatment (Yeh et al, 2009). Over the post few years, Dr. Ko and his team have repeatedly demonstrated positive results of this therapy through workshops, courses and pain clinics throughout Japan., Taiwan, Singapore and the United States (Hoka et al, 2008). A mini-symposium on CMT was also offered in the 13<sup>th</sup> World Society of Pain Clinicians Congress for the World Institute of Pain Meeting in 2008.

Meridian in CMT	Meridian in TCA	C-Point	Actual anatomical location
TxI	Lung	1	On the junction of the metaphysis and diaphysis over the distal radius. The pressure should be applied on the radial side of the flexor carbi radialis directly on the bone; pressure to the radial artery should be avoided (Fig. 7a).
TxII	Pericardia	2	Approximately three finger breadths proximal to the TxI/a (Fig. 7b).
TxIII	Heart	1	On the radial depression of the flexor carbi ulnaris at the junction of the metaphysis and diaphysis over the distal ulna (Fig. 7a).
AxI	Spleen	b	On the tangent line to the plantar-medial depression at the junction of the metaphysis and diaphysis over the proximal end of first metatarsal bone (Fig. 9a, b).
AxII	Liver	2	Approximately 1 cm posterior to the AxI/2 at the same horizontal level as AxI/2 (Fig. 9a).
AxIII	Kidney	a	On the tangent line to the posterior border of the medial malleolus (Fig. 9a).
TyI	Large Intestine	3	On the tangent line to the ulnar side of the radius at the musculotendinous junction (Fig. 8a).
TyII	Triple Energizer	2	Between the distal ulna and radius about one-sixth of the distance above TyII/a toward the olecranon (approximately three finger breadths proximal to TyII/a) (Fig. 8b).
TyIII	Small Intestine	3	On the tangent line to the radial border of the dorsal ulna at the musculotendinous junction (Fig. 8a).
AyI	Stomach	3	At the same horizontal level as AyIII/3, approximately one finger breadth posterior to the anterior crest of the tibia (Fig. 10a).
AyII	Gall Bladder	2	On the tangent line to the anterior border of the fibula at the same horizontal level as AyIII/3 (Fig. 10a).
AyIII	Bladder	3	First identify the Chinese traditional acupoint BL57 (Chengshan), which is in the depression below the belly of the gastrocnemius when the leg is stretched or the heel is lifted. After pressing BL57, find two lines running from it lateroinferiorly and mediotinferiorly; AyIII/3 point is at the lateroinferior end on the tangent line to the posterior surface of the fibula (Fig. 10a, b).

CMT: Collateral Meridian Therapy; TCA: Traditional Chinese Acupuncture

Table 1. Anatomical location of C-points.

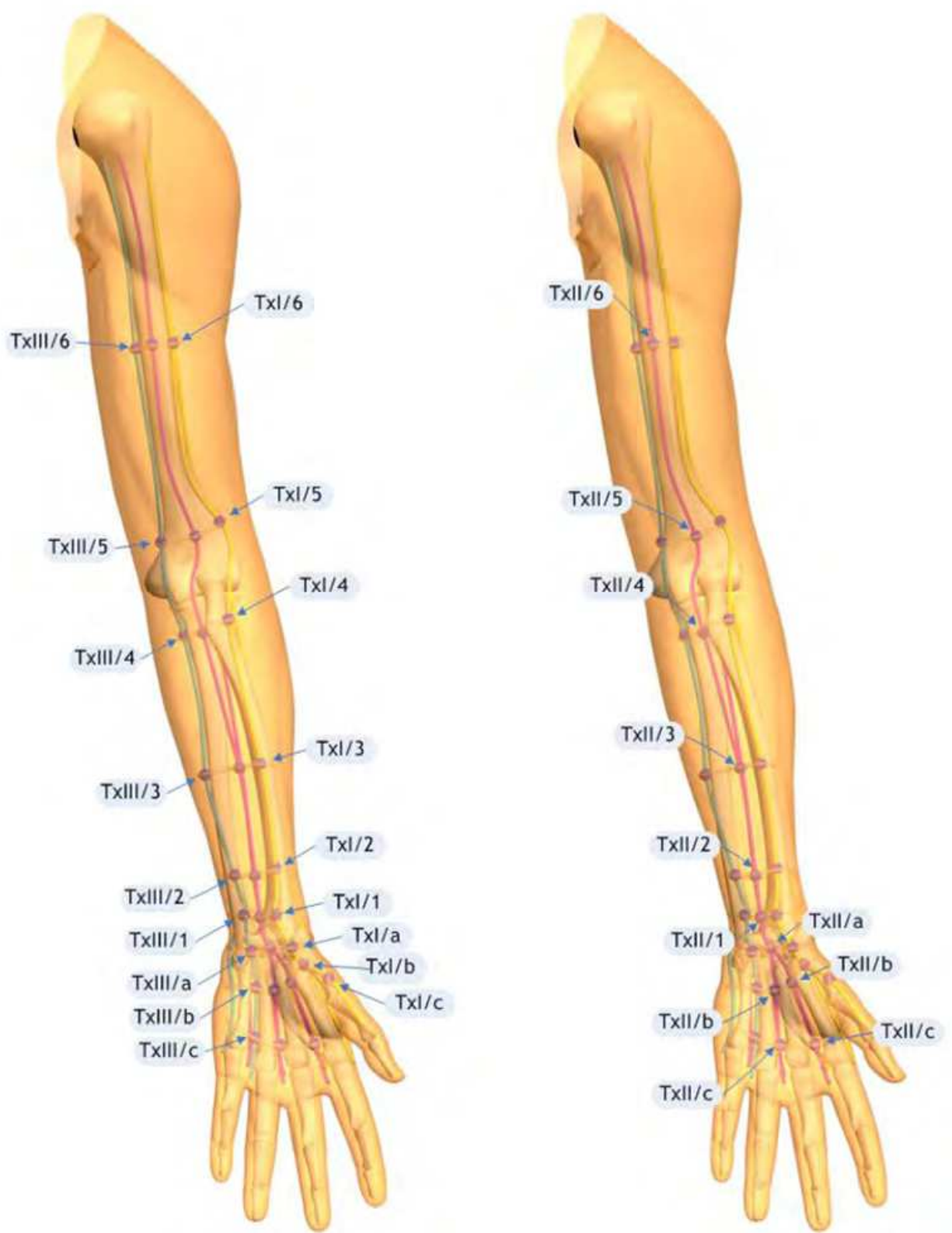


Fig. 7. (a) Volar view of upper extremity for localization of acupoints on TxI and TxIII. (b) Volar view of upper extremity for localization of acupoints on TxII.

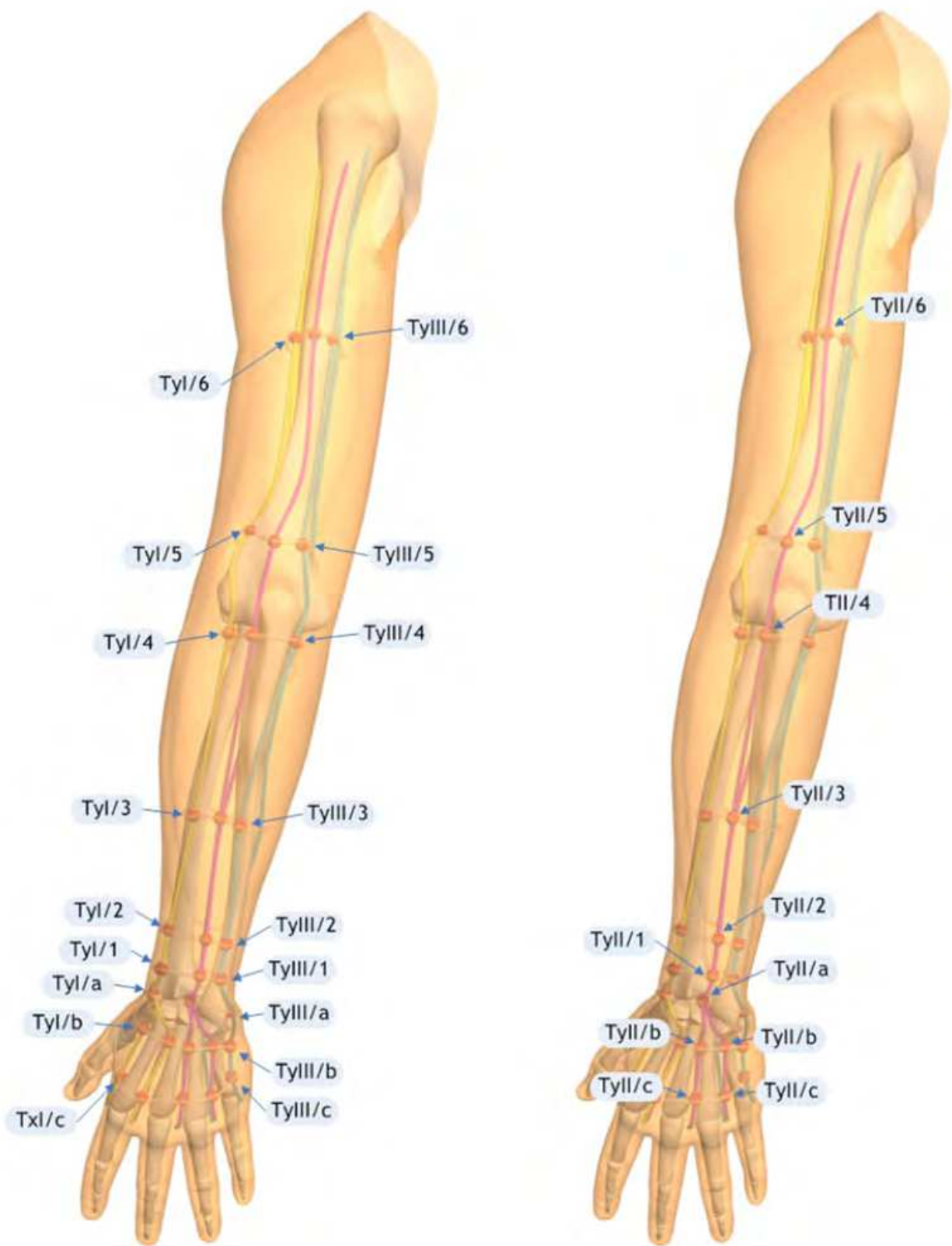


Fig. 8. (a) Dorsal view of upper extremity for localization of acupoints on TyI and TyIII. (b) Dorsal view of upper extremity for localization of acupoints on TyII.

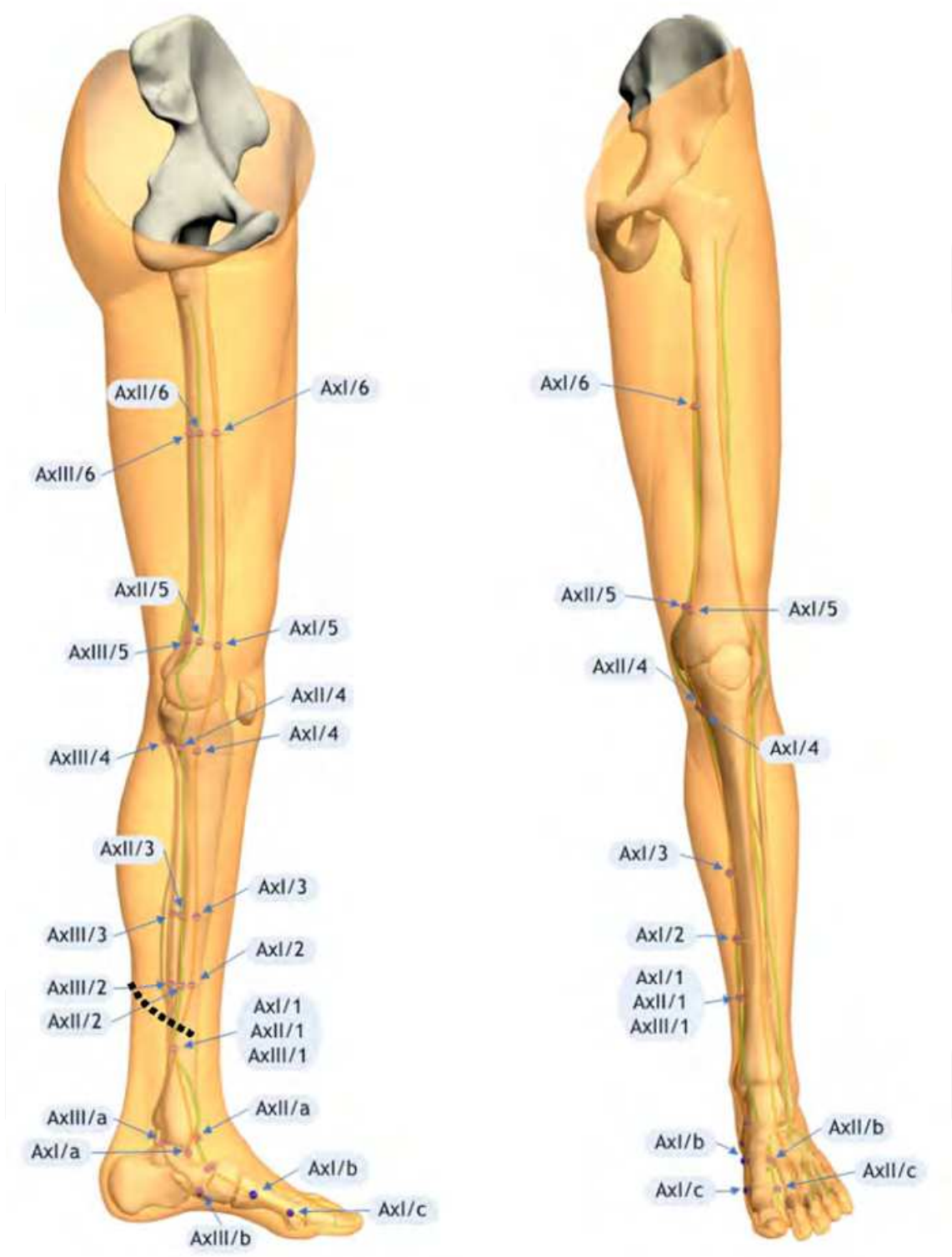


Fig. 9. (a) Medial view of lower extremity for localization of acupoints on AxI and most of AxII and AxIII (except for AxII/b AxII/c and AxIII/c). (b) Anterior view of lower extremity for localization of on AxI and AxII. The dotted line is extended along the curve of the lower border of the medial gastrocnemius belly.

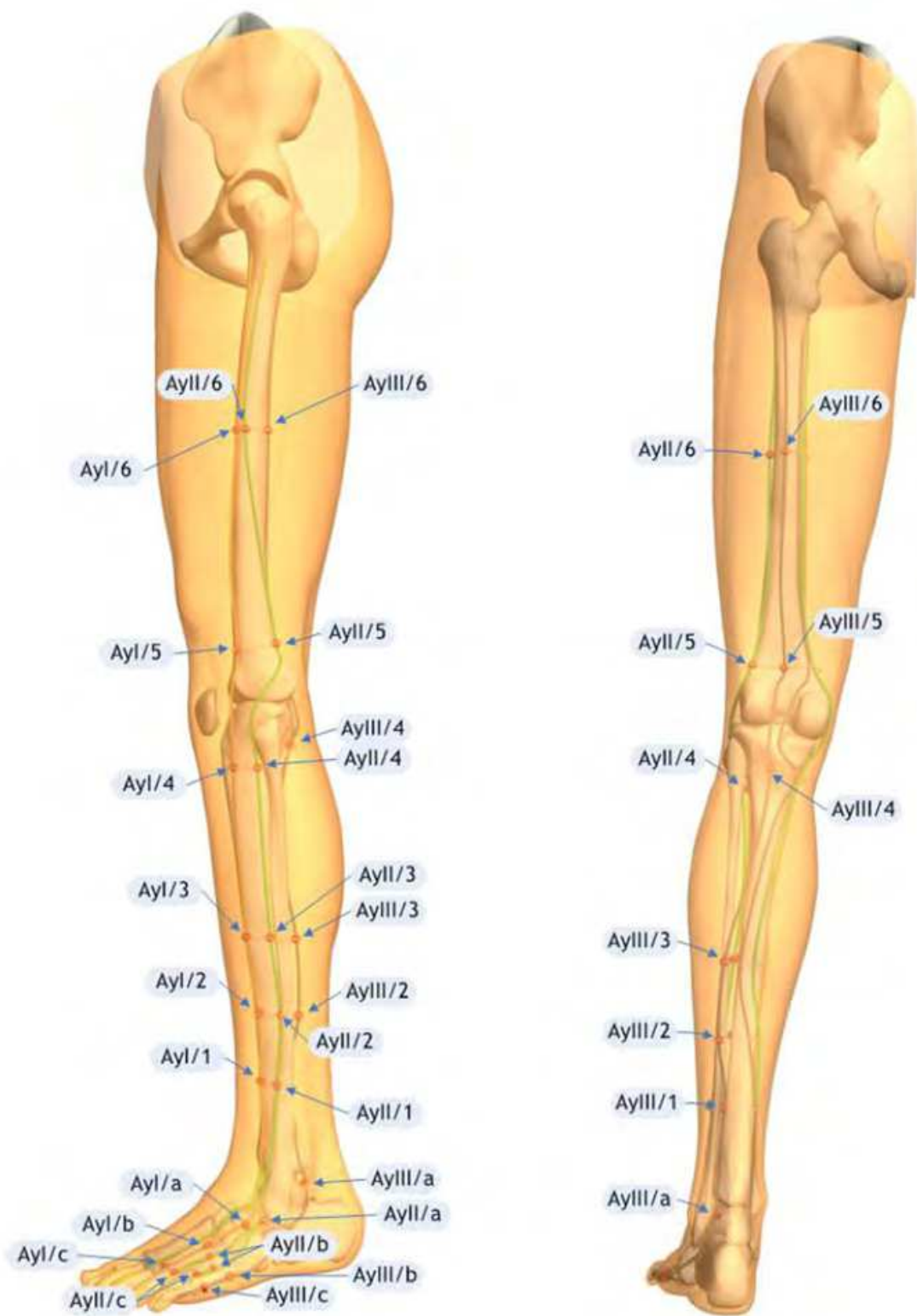


Fig. 10. (a) Lateral view of lower extremity for localization of acupoints on AyI, AyII and AyIII. (b) Posterior view of lower extremity for localization of acupoints on AyII and AyIII.

The National Institute of Health consensus, published in 1998, states that acupuncture shows effectiveness in the treatment of postoperative and chemotherapy induced nausea and vomiting and postoperative dental pain. The statement concludes that acupuncture may be useful in other conditions, including myofascial pain, osteoarthritis, low back pain, menstrual cramps and so on. In addition, we conducted a MEDLINE search and found that acupuncture therapy is also effective for low back pain (LBP) and myofascial pain. From prospective randomized controlled trials published in the peer-reviewed medical literature after 1998, we summarize the acupoints/meridians use for TCA and CMT in the management of LBP in table 2. According to the rules that we have introduced in this article, we can choose the corresponding healthy meridian and formats a set of acupoints for the treatment of LBP, whereas in TCA, one usually uses the diseased meridian, with different acupoints chosen in different reports (Ezzo et al, 2001; Leibing et al, 2002; Meng et al, 2004; Trinh et al, 2007; Wang et al, 2008; Yeh et al; 2009). Based on our literature review, patients with LBP received at lease short-term pain relief after TCA treatment; the CMT also provides significant pain relief via different approach with a standardized formulated protocol. Table 3 shows as summary of published CMT clinical reports for different types of pain (Wong et al, 2006; 2007; Hoka, 2008; Yeh et al, 2008; 2009, Lin et al, 2010). Furthermore to date, no clinical reports described the use of TCA to treat complex regional pain syndrome which patients may not tolerate the direct stimulation/acupuncture to the painful area. In contrast, CMT provides a promising technique for treating complex regional pain syndrome that can be used without touching the painful sites (Wong et al, 2007; Hoka, 2008).

Meridian	TCM [ref]	CMT [ref]
Governing vessel meridian	(+) Wang et al (2008) Leibing et al (2002)	
Urinary bladder meridian (AyIII)	(+) Wang et al (2008) Leibing et al (2002) Meng et al (2004) Ezzo et al (2001) Trinh et al (2007)	
Lung meridian (TxI)		(+) Yeh et al (2008)
Heart meridian (TxIII)		(+) Yeh et al (2008)
Spleen meridian (AxI)	(+) Wang et al (2008) Carlsson & Sjolund (2001)	
Large intestine meridian (TyI)	(+) Wang et al (2008)	

TCM: traditional Chinese medicine; CMT: collateral meridian therapy. (+): treatment meridian.  
Number: reference number.

Table 2. Acupuncture points/meridians used for TCM and CMT in the management of low back pain and lumbar myofascial pain syndrome

First author (year) [Ref]	Condition treated	Post intervention	
		Pain reduction	Physical function recovery
Wong et al (2006)	Acute and chronic intractable pain	+	+
Lin et al (2010)	Primary dysmenorrhea	+	-
Wong et al (2007)	Complex regional pain syndrome	+	+
Hoka et al (2008)	Complex regional pain syndrome	+	+
Yeh et al (2008)	Shoulder-tip pain	+	+
Yeh et al (2009)	Post-regional anesthesia/analgesia backache	+	+

CMT, collateral meridian therapy. +, Yes; -, Not observed

Table 3. Clinical reports of CMT for pain management

3. Conclusion

CMT provides a different approach for managing intractable pain and various illnesses. It may play a role in the field of complementary and alternative medicine. The role of CMT in pain management looks promising for both acute and chronic pain, even including intractable pains, even though published randomized controlled trials are so far lacking. It is our hope that future research can focus on methodologically strong randomized controlled trials to validate the efficacy of CMT with high evidence level. The purpose of this article is to introduce the theory of CMT to interest physicians to achieve a greater awareness and understanding of this technique and theory.

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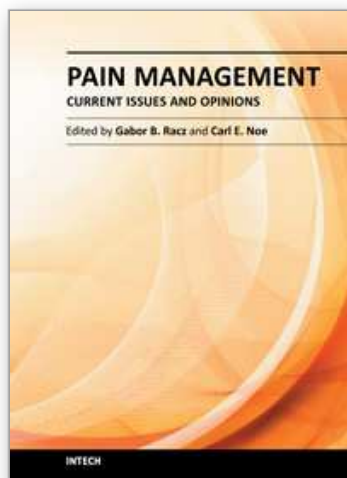
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