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Acupuncture Analgesia Research and Clinical Practice in Taiwan

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1. Introduction

Traditional Chinese acupuncture has a history of over 2,500 years. It is now considered to be a type of "complementary medicine" because it is effective in the treatment of many conditions with fewer side effects compared with other medical procedures, such as surgery or treatment with pharmaceuticals (Wu, 1996). The WHO has published guidance describing the efficacy of acupuncture in the cure or relief of 64 different symptoms (2003). For example, acupuncture has been successfully applied in cases of chronic pain, nausea, arthritis, and digestive problems, among others.

Two different strategies have been commonly used when performing acupuncture therapy, i.e., manual acupuncture (MA) and electroacupuncture (EA). EA is a modified form of traditional MA. The advantage of EA is in its combined therapeutic effects of transcutaneous electric nerve stimulation (TENS) and MA.

2. General concepts of the mechanism of acupuncture

Many studies in animals and humans have demonstrated that acupuncture can cause multiple biological responses (Wang, et al., 2001). MA and EA are capable of triggering a chain of events that can be understood through controlled experiments. The best known mechanism is via endogenous opiates and their receptors. Early works have demonstrated the role that endogenous opiates play in the central nervous system in acupuncture analgesia. Different kinds of endogenous opiates, such as β-endorphin, enkephalin, endomorphin, and dynophin, have been reported to act as frequency-dependent factors in EA.

In the 1970s and early 1980s, naloxone, an opiate receptor antagonist, was found to attenuate the analgesic actions of acupuncture in humans (Mayer, et al., 1977) and in mice (Pomeranz&Chiu, 1976). The release of a morphine-like substrate in the central nervous system was hypothesized to be a possible mechanism of this analgesic action. Soon afterwards, β-endorphin and enkephalin were purified and it was suggested that these opiates play a role in acupuncture in humans and animals (Clement-Jones, et al., 1980; Kiser, et al., 1983; Pert, et al., 1981). In humans, elevated levels of β-endorphin in the cerebrospinal fluid and of plasma enkephalin were observed after acupuncture treatments. The relationship between acupuncture analgesia and different kinds of endogenous opiates was explored in detail (Cheng, et al., 1979).

This chapter is focused on the basic and clinical studies of acupuncture analgesia performed by us and our colleagues in Taiwan in recent years. Descriptions of our personal experiences in providing acupuncture treatments for analgesia are also included.

3. Basic research

3.1 Effects of EA analgesia on central monoaminergic neurons

3.1.1 Relationship of EA with serotonergic neurons

During the past decades, investigations of the mechanisms of EA analgesia have focused on the effects of endogenous opiates. In addition to opioids, serotonin has been a subject of particular emphasis (Cheng, et al., 1979). We attempt to explore the relationship between EA and serotonergic neurons in the central nervous system. We found that tail pressure pain thresholds were increased by EA and 5-hydroxytryptophan (5-HTP, a precursor of serotonin) in rats, but decreased by administration of *p*-chlorophenylalanine (PCPA, an inhibitor of serotonin synthesis) and naloxone (a μ-opioid antagonist). The changes in pain threshold produced by EA were reduced by pretreatment with PCPA. These results have revealed that EA analgesia activates serotonergic neurons in the central nervous system (Tsai, et al., 1989).

3.1.2 Relationship between EA and adrenergic neurons

Further, we explored the relationship between EA analgesia and other monoaminergic neurons in mice. The involvement of adrenergic neurons was tested. The writhing responses induced by acetic acid and the pain induced by formalin were found to be inhibited by EA at 2 Hz and 10 Hz (0.5 msec, 3–5 V). Analgesia induced by EA was potentiated by intracerebroventricular (i.c.v.) injections of serotonin (5-HT) and norepinephrine (NE) and was attenuated by intraperitoneal administration of inhibitors of monoamine synthesis (PCPA and α-MT), as well as reserpine, a monoamine depletor. The study revealed that the effects of EA analgesia are also related to the adrenergic neurons in the central nervous system (Kuo, 1995).

3.1.3 Relationships of different frequencies of EA analgesia with monoaminergic neurons

We performed a study to characterize the relationships of different frequencies of EA analgesia with monoaminergic neurons and opioid receptors. The formalin test was performed in ICR mice. The brain concentrations of endogenous monoamines were determined by HPLC. The evidence suggests the following. (1) Exogenous 5-HT and NE enhance the analgesic effect of the different frequencies of EA, especially at 100 Hz. (2) The antinociception of EA at different frequencies of stimulation (2, 10, and 100 Hz) were found to be attenuated by PCPA, and were potentiated by 5-HTP. (3) Prazosin (an adrenergic α_1 receptor antagonist) and clonidine (an adrenergic α_2 receptor agonist) were found to be capable of potentiating the antinociception of different frequencies of EA whereas yohimbine (an adrenergic α_2 receptor antagonist) was found to reverse 2-Hz and 10-Hz EA analgesia and potentiate 100-Hz EA analgesia (4). Pindobind-5-HT_{1A} (a 5-HT_{1A}-directed antagonist) and LY-278584 (a 5-HT_3 antagonist) were found to reverse the 3 different frequencies of EA analgesia, and ketanserin (5-HT_2 receptor antagonist) was found to potentiate 100-Hz EA analgesia. The concentrations of endogenous brain monoamines were influenced by different frequencies of EA. These results reveal that the analgesic effect of EA is related to serotonergic and adrenergic neurons with different frequencies of stimulation. In the serotonergic pathway, EA analgesia may be mediated via $5\text{-}HT_{1A}$ and $5\text{-}HT_3$ receptors. Furthermore, $5\text{-}HT_2$ may be involved in high frequency EA analgesia. In the adrenergic pathway, both adrenergic α_1 and adrenergic α_2 receptors were found to be involved in EA analgesia and may provide opposing functions (Yu, 1995).

3.1.4 Intermittent-alternating mode of administering EA stimulation postpones the development of EA tolerance

As mentioned above, EA produces analgesia that is mediated by a variety of central neurochemical substances including opioid peptides and serotonin. However, regardless of the applied frequency, prolonged EA stimulation for several hours inevitably leads to a decrease in the analgesic effect. This phenomenon is known as "tolerance to EA analgesia" or "EA tolerance" and is known to discourage the use of EA anesthesia during major surgery. Clinical experience has revealed that the effect of EA analgesia can last longer if EA is applied intermittently.

We conducted a study to test whether changes in the parameters and mode of stimulation can prevent, or at least postpone, the development of EA tolerance. EA stimulation was applied to bilateral Zusanli (ST36) and Sanyinjiao (SP6) acupoints in rats using a simultaneous mode (S mode) to both legs or an alternating mode (A mode) between the 2 legs. A similar degree of analgesic effect was obtained in S and A modes of stimulation. However, tolerance usually developed within 5 h in the S mode, and was postponed for 10 h in the A mode. The results revealed that EA with the A mode rather than the S mode provides the benefit of postponing or avoiding EA tolerance without affecting the potency of the EA-induced analgesia (Lin, et al., 1993). The conclusion of this study is of particular importance. The EA machines currently used in the clinics worldwide employ the A mode theory.

4. Clinical research

Everyone has experienced pain related to complicated physiological and psychological reactions. Pain can make patients feel uncomfortable and become sleepless or agitated. To demonstrate the efficacy of acupuncture analgesia, a series of studies was conducted by our group in Taiwan and are described below.

4.1 Effect of high and low frequency EA on pain after lower abdominal surgery

Postoperation pain is a very subjective phenomenon. Patients recovering from the same surgical procedures individually experience a different extent of postoperative pain. The pain occurring during the first few hours after the operation is usually quite intense. Pain can be felt after the operation and when the use of analgesic drugs is diminished, it can be a sensation involving intense pain for a few hours before it stops. In addition, pain stimulates the sympathetic nervous system and causes increases in the heart rate, blood pressure, sweat production, and endocrine hyperfunction, and delays the patient's prognosis (Edwards, et al., 2007; Kumar&Wilson, 2007).

To date, only a few studies have investigated the effects of acupuncture on postoperative pain and have shown conflicting results (Christensen, et al., 1989; Christensen, et al., 1993; Galloway, et al., 1984; Martelete&Fiori, 1985). A critical difference among these studies was the stimulation modality and the lack of a sham control. None of these studies examined the effect of pre-stimulus acupuncture on postoperative pain and concomitant side effect profiles.

We performed a study to evaluate whether preoperative application of different frequencies of EA stimulation can be effective in relieving postoperative pain, as well as postoperative opioid-related side effects. We examined the effects of preoperative EA at classical bilateral acupuncture points (Zusanli; ST36) on postoperative pain and opioid-related side effects. One hundred healthy consenting women undergoing lower abdominal surgery were randomly assigned to 4 treatment regimens: Group I (n = 25), control; Group II (n = 25), sham-EA (needle insertion without electrical stimulation); Group III (n = 25), low EA (2 Hz of electrical stimulation); and Group IV (n = 25), high EA (100 Hz of electrical stimulation). EA groups received needle insertion with or without electrical stimulation 20 min prior to anesthesia. All patients received patient-controlled analgesia (PCA) of morphine after the operation. Postoperative pain was evaluated by recording the (1) time of the first self-administration of an analgesic, (2) number of instances of PCA self-administration, (3) total amount of morphine required for PCA, and (4) patients' visual analogue scale (VAS) pain score. We found that the first analgesic requested was 10, 18, 28, and 28 min in the control, sham-, low-, and high-EA groups, respectively. During the first 24 h, the total amount of morphine required was decreased by 21%, 43%, and 61% in the sham-, low- and high-EA groups, respectively. The incidence of nausea and dizziness during the first 24 h after surgery was significantly reduced in both the low- and high-EA groups compared with the control and sham-EA groups. We also found that sham-EA exerts a beneficial effect with respect to its pain relieving quality but not on the side effect profiles. Our findings demonstrate that preoperative treatment with low- and high-EA can reduce postoperative analgesic requirements and associated side effects in patients undergoing lower abdominal surgery (Lin, et al., 2002).

4.2 Effects of acupuncture on pain after cesarean section

We performed a study to characterize the effects of acupuncture or EA on the acuppoint Sanyinjiao (SP6) to alleviate pain after operation in conjunction with PCA. In this study, our subjects were pregnant women who had a cesarean section for their childbirth. Sixty women, who had had spinal anesthesia during the cesarean section, were randomly assigned to the control, acupuncture, and EA group. After the operation, acupuncture or EA was provided on the bilateral acupuncture point Sanyinjiao (SP6), and PCA was made available. From the point of the first morphine request, the frequency of PCA demands in 24 h and the doses of PCA used were recorded under double-blinded conditions. In addition, the subjects' vital signs, opioid-related side effects, and pain scores were monitored.

The results showed that the members of the acupuncture and EA groups were able to delay the time before morphine was requested by up to 10–11 minutes relative to the control group. The total dose of PCA used within the first 24 h was 30%–35% less in the acupuncture and EA groups when compared with the control group. This difference was statistically significant. However, there was no significant difference between the acupuncture and EA groups. The pain scores of the EA and acupuncture group were lower than the pain score of the control group within the first 2 h, and these differences were statistically significant. However, 2 h later, there were no significant differences of the VAS scores between either of the treatment groups and the control group. Finally, the incidence of opioid-related side effects, such as dizziness, was lower in both the acupuncture and EA groups relative to the control group. This study reveals that the application of acupuncture and EA could delay the time required before a request for pain relief medication after a cesarean section and decrease the PCA doses used within the first 24 h (Wu, et al., 2009).

4.3 Immediate effects of acupuncture on gait patterns in patients with knee osteoarthritis

Osteoarthritis (OA) is a degenerative joint disease in the elderly population, with the knee being the most commonly affected joint in the lower limbs. Clinical symptoms of knee OA may include pain, swelling, stiffness, muscle weakness, limited range of motion (ROM), and deformity (Kindynis, et al., 1990). Any one of these symptoms will affect the function of the joint and lead to abnormal gait patterns. Pain relief is of primary urgency at clinics where efforts are made to reduce the functional disabilities caused by pain (Caldwell, et al., 2002).

In previous reports, the pain and discomfort arising from OA can be directly and quickly reduced, and the ROM of the joint can be improved via acupuncture (Berman, et al., 1999; Christensen BV, et al., 1992; Ezzo, et al., 2001; Gaw, et al., 1975). However, these studies were based mainly on data obtained from subjective evaluations. No objective assessment of the efficacy of acupuncture in treating knee OA by evaluation of gait improvement has been reported in the literature. Three-dimensional gait analysis has been widely used in the diagnosis of various kinds of neurological and musculoskeletal diseases and in the assessment of subsequent treatment (Barr, et al., 1994; Goh, et al., 1993; Huang, et al., 2008a, 2008b; Lu, et al., 2008; Messier, et al., 1992; Powers, et al., 1999). Therefore, gait analysis techniques can be very helpful for an objective and quantitative assessment of the treatment effects of acupuncture on knee OA. There have been several studies on the effects of knee OA on walking patterns using gait analysis. Patients with knee OA were found to have altered temporal-distance variables, including slower walking speed, decreased stance knee flexion and ROM (Barr, et al., 1994; Gok, et al., 2002; Lin KH, et al., 2008), increased knee abductor moments (Childs, et al., 2004; Goh, et al., 1993; Lin, et al., 2008), decreased knee extensor moments (Goh, et al., 1993; Mundermann, et al., 2005), and decreased peak vertical force during push-off. However, the use of gait analysis for the assessment of treatment effects in patients with knee OA has been limited.

We conducted a study to investigate the short-term effects of acupuncture treatment on patients with knee OA by comparing the lower extremity kinematics and kinetics during gait before and after acupuncture stimulation, as this would form a basis for subsequent long-term follow-up studies. Twenty patients with bilateral medial knee OA were assigned evenly and randomly to a sham group and an experimental group. During the experiment, the experimental group underwent a 30-min formula EA treatment while the sham group received a sham treatment. Before and after treatment, subjects were evaluated for knee pain using VAS and then their performance of level walking was assessed using gait analysis. We found that the VAS scores were decreased significantly after acupuncture in both groups, and mean change in the VAS values of the experiment group was 2-fold greater than that of the sham group. After formula acupuncture stimulation, while no significant changes were found in all the gait variables in the sham group, the experimental group exhibited significant increases in the gait speed, step length, as well as in several components of the joint angles and moments. The results suggest that improved gait performance in the experimental group may be associated with pain relief after treatment, but the relatively small decrease in pain in the sham group was not enough to induce significant improvements in gait patterns (Lu, et al., 2010).

4.4 Comparison of the pain relief effect of EA, regional nerve block, and EA plus regional nerve block in cases of frozen shoulder

Frozen shoulder is a type of spontaneous, progressive periarthritis that occurs over the shoulder joint, and its etiology is not yet clear. Traditional treatments for frozen shoulder have included conservative medical therapy, physical therapy, nerve block, and acupuncture.

We performed a study to determine the pain relief effect of EA, regional nerve block (RNB), and a combination of EA+RNB for frozen shoulder. A total of 150 patients with newly acquired frozen shoulder were randomly divided into 3 groups. Group I patients (n = 50) were given RNB with stellate ganglion block and suprascapular nerve block by treatment with 10 mL of 1% xylocaine. Group II patients (n = 50) underwent EA with local acupoints Jianyu(LI15), Jianjing(GB21), Jianqian (EX-UE12), and ouch points treatment. Group III patients (n = 50) underwent a combination of EA+RNB, which was performed with acupuncture first, followed by RNB. Six vectors of movements were investigated in all methods. A 4-grade Bromage score was used for pain assessment with Grade 1 indicating completely painless; Grade 2, slight pain (i.e., pain on motion); Grade 3, moderate pain (i.e., pain without motion); and Grade 4, severe pain (with requests for analgesics). The range of the shoulder joint was also recorded. Patients were requested to ask for a second treatment if pain recurred (Barr, et al., 1994).

The onset (time from injection to maximal pain relief), duration (time from injection to Grade 3 Bromage score), and side effects were recorded. The result showed that the combined EA and RNB method had significantly high pain control quality, longer duration, and a better range of movement of the shoulder joint than that of EA or RNB performed alone (Lin, et al., 1994).

4.5 Comparative evaluation of EA and TENS for the treatment of myofascial pain syndrome

Myofascial pain syndrome is a neuromuscular dysfunction that arises from a trigger point in skeletal muscle. This disorder can occur in any skeletal muscle. It is usually caused by trauma, inflammatory disease, overwork, or fatigue. It can also be caused by the cumulative effects of longstanding repetitive minor trauma or longstanding muscle tension due to poor posture, occupational disease, or emotional stress. Cervical myofascial pain syndrome is defined by the specific neck muscle site and the resulting pain and stiffness of the neck is accompanied by disturbances in autonomic conditional phenomena, such as headache, dizziness, nausea, vomiting, and insomnia. This affects the daily activities and lives of patients. We performed a study to evaluate quantitatively and to study objectively the immediate effect of the treatment of trigger points with several physical medicine modalities in order to improve our understanding of the clinical application of EA stimulation and TENS on myofascial pain. In total, 66 patients with cervical myofascial pain were randomly divided into 3 groups for the administration of 3 different combinations of physical medicine modalities.

In the first group, a cervical hot pack and a stretching exercise was performed. In the second group, a cervical hot pack and 100-Hz EA at bilateral Fengchi (GB20) and Jianjing (GB21) acupoints as well as a stretch exercise were performed. In the third group, a cervical hot pack and 100-Hz TENS as well as a stretching exercise were performed. The improved degree of VAS, pain threshold, and pain tolerance values at trigger points were recorded for the comparison of the immediate effect between the 3 groups. A paired t-test and one-way ANOVA were used for statistical analysis of the data.

The results revealed the following: (1) The 3 groups obtained significant improvement in pain reduction by evaluation of VAS after treatment, but there was no significant difference in the immediate therapeutic effect among the 3 groups. (2) There was significant improvement in the pain threshold in the EA group after treatment, but not in the control and TENS groups. (3) There was no statistically significant improvement in pain tolerance among the 3 groups after treatment. The results suggest that EA could effectively alleviate the pain threshold when trigger points are addressed as a treatment for myofascial pain syndrome (Chen, 1998).

4.6 Assessment of the effect of postoperative acupuncture stimulation on pain relief after total knee replacement

Postoperative pain, which occurs during the hours immediately after a surgical operation, is very intense and diminishes gradually. We performed a study to estimate the effect of 100-Hz frequency EA stimulation combined with PCA to relieve pain after an operation. We selected total knee replacement (TKA) patients as subjects to examine the effects of 100-Hz EA in conjunction with PCA on alleviation of postoperative pain. The subjects were randomized into 3 groups: a control group, sham EA group, and 100-Hz frequency EA group. Each group consisted of about 30 patients. The study results show that the total dose of PCA used within the first 24 h was 29% less in the 100-Hz EA group relative to the control group. This was also statistically significant. Our results revealed that treatment with 100-Hz EA postpones the initial demand for pain control and decreases the total PCA dose within the first 24 h. When comparing pain scores, the patients in the 100-Hz EA group had lower scores than those of the control and sham EA groups within 6 h. These were statistically significant. However, 6 h later, all 3 groups had similar pain scores. Finally, opiate-related side effects were lowest in the low- and high-frequency EA groups. In conclusion, the results suggest that 100-Hz EA can postpone the initial demand for pain control and decrease the total PCA dose requested within the first 24 h. These effects can help to reduce opiate-related side effects (Chen, 1992).

4.7 Conclusions for clinical research

Our results suggest that acupuncture/EA has significant efficacy with respect to pain relief and reduction in the side effects of morphine administration after surgery. Furthermore, acupuncture/EA also has efficacy against pain due to frozen shoulder, knee-joint OA, and cervical myofascial pain.

5. Evidence-based medicine in acupuncture

In Western medicine, evidence-based medicine (EBM) is popular. EBM adopts methods of epidemiology and statistics, in order to analyze data from an enormous medical database, to define effective treatments. EBM is dependent on the use of randomized controlled trials, as well as systematic reviews of a series of trials and meta-analysis. Practitioners are thereby able to optimize patient care by referring to the best research. Promotion of EBM will certainly improve the quality of clinical research and medical care.

Literature indicates that acupuncture can be used for treatment of many diseases and health cultivation, but is it really effective? We performed a literary review that investigated its effectiveness using EBM. We invited scholars who specialized in each of the systems. These scholars shared their opinions, formulated questions, and helped to define the standards. In total, 234 papers were divided into 10 groups and were evaluated by 29 reviewers. The information is classified into the following 10 groups.

1. Pain
2. Immune
3. Nerve
4. Respiration and Circulation
5. Gastrointestinal
6. Urinary
7. Muscle and skeleton
8. Obstetrics/gynecology and pediatrics
9. Metabolism

10. miscellaneous

The following 5 steps of EBM were used to evaluate the information.

1. Formulating answerable clinical questions
2. Searching for the best evidence
3. Critical appraisal
4. Applying evidence to patients
5. Auditing

We found that higher strength of evidence for curative effects was centralized in the muscular and skeletal systems. OA and lower back pain were among the conditions most successfully treated by acupuncture. Similarly, significantly high strength of evidence was identified for the treatment of symptoms, such as asthma and vomiting. Safety and cost-effectiveness of acupuncture were also supported by higher strength of evidence (Lin JG&Lin, 2008).

6. Clinical practice

Dr. Jaung-Geng Lin has performed acupuncture on many world leaders and has received numerous awards. Regarding the selection of acupoints for acupuncture analgesia, Dr. Lin, according to his experience, has the following suggestions.

6.1 Therapeutic principles for pain relief

1. For acute strain myofibrositis or myofascial pain syndrome, Yanglingquan (GB34) is the principal acupoint for pain relief. In the traditional theory, Yanglingquan (GB34) is one of the eight meeting points, and is where the qi of the tendon gathers. The tendon in the classical literature indicates the soft tissue, such as muscle, tendon, and fascia in modern medicine. The classical literature also indicates that soft tissue diseases are usually treated at the Yanglingquan (GB34) acupoint.
2. If the pain is caused by a sprain, Yanglingquan (GB34) is the first choice of acupoints to relieve pain.
3. Following the meridian from the painful location to identify appropriate acupoints is important.
4. The trigger area or tenderness points are appropriate points to perform acupuncture. These points are ouch points as described in "Beiji Qian Jin Yao Fang; Essential Recipes for Emergent Use Worth A Thousand Gold" (Sun, Simiao; 581 AD).
5. If the pain symptom induces anxiety or unstable emotion, acupoints for sedation such as Shenmen (HT7) could be performed.

6.2 For specific areas of pain, we have the following suggestions.

6.2.1 Headache

6.2.1.1 Frontal headache (Yangming meridian headache)

Selection of distant points: Hegu (LI4; Figure 1).
Selection of adjacent points: related acupoints.
If the headache is caused by allergic rhinitis: combine with Yingxisng (LI20; Figure 2).

6.2.1.2 Lateral headache (Shaoyang meridian headache)

Selection of distant points: Yanglingquan (GB34; Figure 3)

Selection of adjacent points: Xuanlu (GB5; Figure 4)

6.2.1.3 Occipital headache (Taiyang meridian headache)

Selection of distant points: Lieque (LU7; Figure 5)
Selection of adjacent points: Fengchi (GB20; Figure 6) and Tianzhu (BL10; Figure 7)

6.2.1.4 Parietal headache (Liver meridian headache)

Selection of distant points: Taichong (LR3; Figure 8; combined with liver meridian); Yougquan (KI1; Figure 9; combined with kidney meridian)
Selection of adjacent points: Baihui (GV20; Figure 10)

6.2.2 Neck pain

Selection of distant points: Lieque (LU7; Figure 5)
Selection of adjacent points: Fengchi (GB20; Figure 6)

6.2.3 Neck sprain

Yanglingquan (GB34; Figure 3) can be added

6.2.4 Frozen shoulder

Selection of distant points: Yanglingquan (GB34; Figure 3), Tiaokou (ST38; Figure 11), and Chengshan (BL57; Figure 12)
Selection of adjacent points: Jianliao (TE14; Figure 13), Jianjing (GB21; Figure 14), and ouch point.

6.2.5 Hypochondriac pain

Neiguan (PC6; Figure 15), Zhigou (TE6; Figure 16), and Sanyanglou (TE8; Figure 17)

6.2.6 Abdominal pain

Zusanli (ST36; Figure 18)

6.2.7 Dysmenorrhea:

Zusanli (ST36; Figure 18) and Sanyinjiao (SP6; Figure 19)

6.2.8 Waist pain, back pain, and sciatica

Selection of adjacent points: Shenshu (BL23; Figure 20) and Mingmen (GV4; Figure 21)
Selection of distant points: Weizhong (BL40; Figure 22), Yanglingquan (GB34; Figure 3), Huantiao (GB30; Figure 23) and Kunlun (BL60; Figure 24)

6.2.9 Knee joint pain

Yanglingquan (GB34; Figure 3) and Yinlingquan (SP9; Figure 25)

6.2.10 Ankle pain

Kunlun (BL60; Figure 24), Taixi (KI3; Figure 26), and Yanglingquan (GB34; Figure 3)
It is suggested that patients with neck pain, frozen shoulder, waist pain, and back pain should follow individual exercise programs as described in our previous book (Lin JG, 1988).

The above mentioned acupoints are of particular importance and can be applied in clinical practice. These acupoints are described because they are the most important acupoints for analgesia. In addition, the rules for combinations of acupoints and for acupuncture should be taken into consideration. In brief, the following should be considered as the rules for acupoints combinations.

1. Using single acupoint only: treat with only one acupoint.
2. Using two acupoints at one time: use the same acupoint on both the sides of the body.
3. Using a combination of anterior and posterior points: choose the acupoints on the anterior and posterior side of the local origin of the disease.
4. Using a combination of exterior and interior points: choose the acupoints on both sides of the local origin of the disease.
5. Using a combination of upper and lower points: choose the acupoints on the upper and lower extremity at the same time.
6. Using a combination of near and distant acupoints: choose the acupoints near the local disease area and a distant area.
7. Using a combination of "master" and "guest" acupoints: choose the Yuan point of the main meridian first and the Lou point of the opposite meridian later.
8. When applying a treatment for lack of vigor and symptoms thereof, use the vigorous points to treat weak bodies and choose acupoints according to symptoms.

With regard to the rules for acupuncture prescription, the chosen acupoints can be divided into 4 groups according to the functions of: principle, associate, adjuvant, and messenger for clinical applications. (1) The principle is the most important point for therapeutic effects. (2) The associate assists and enhances the effects of the principle. (3) The adjuvant assists the principles to treat the complication. (4) The messenger harmonizes the effects of the others.

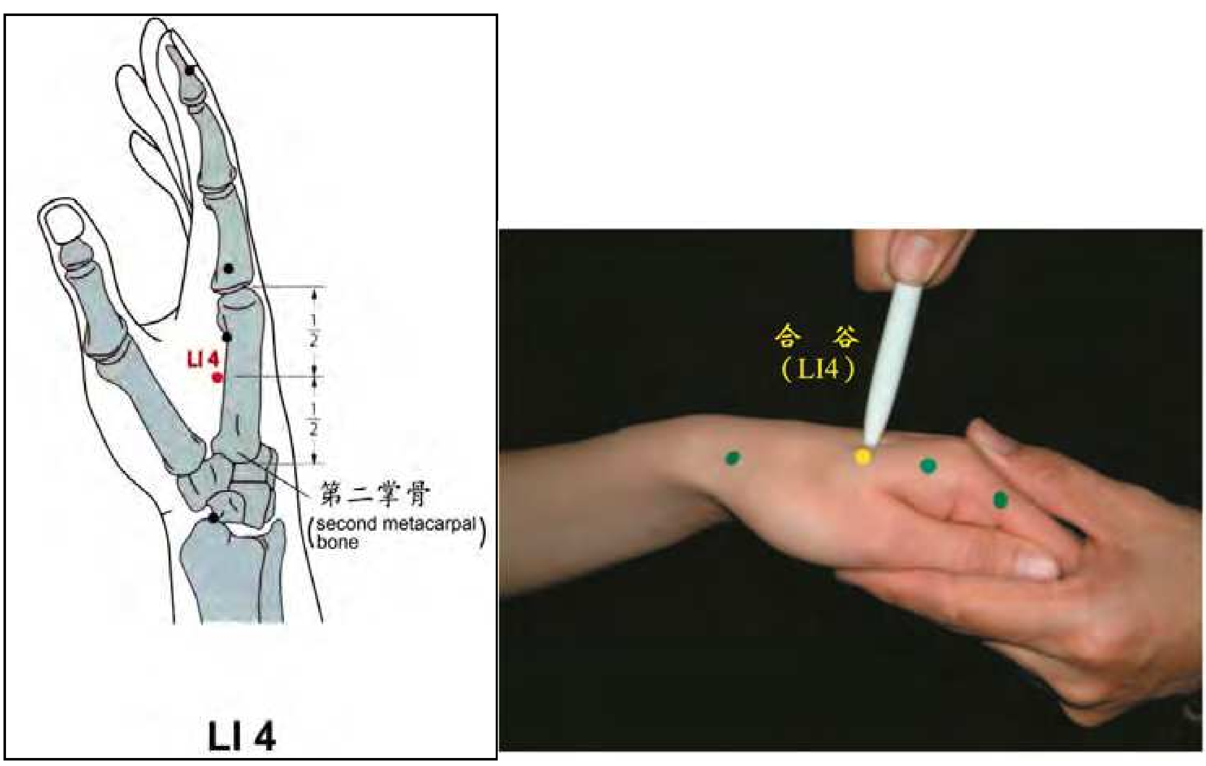


Fig. 1. Hegu(LI4). On the dorsum of the hand, radial to the midpoint of the second metacarpal bone (WHO 2008).

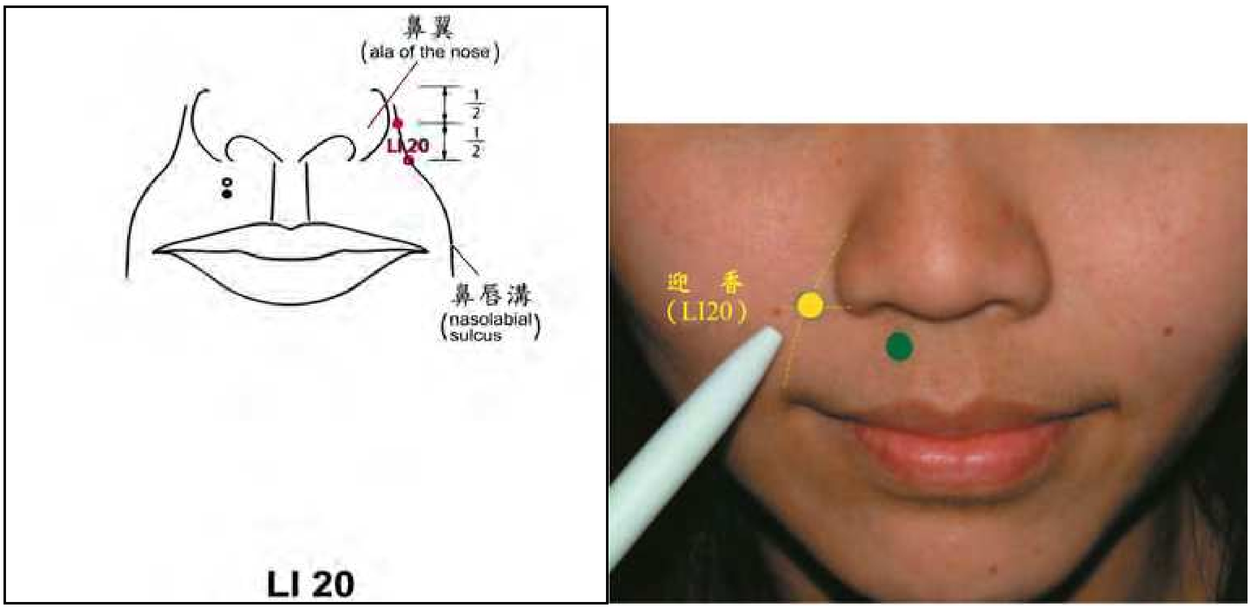


Fig. 2. Yingxiang (LI20). On the face, in the nasolabial sulcus, at the same level as the midpoint of the lateral border of the ala of the nose. (WHO 2008)

Remarks: Alternative location for LI20 - On the face, in the nasolabial sulcus, at the level of the inferior border of the ala of the nose.

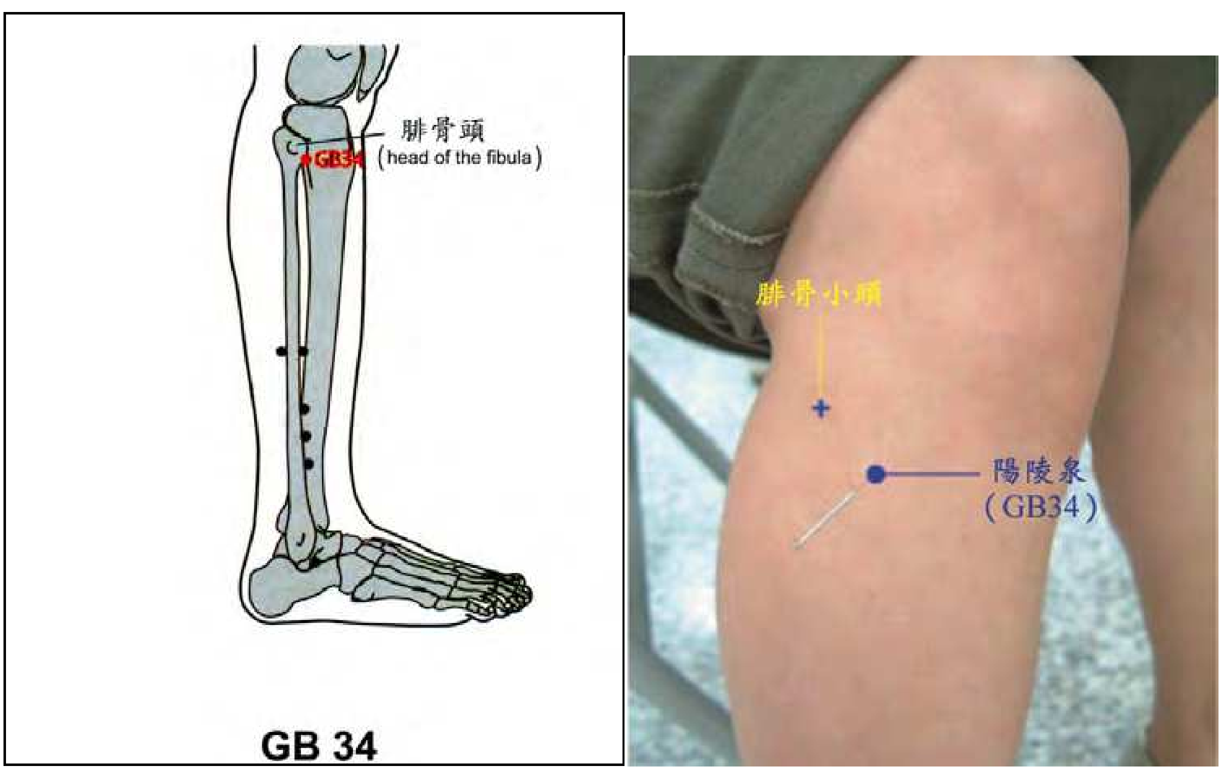


Fig. 3. Yanglingquan (GB34). On the fibular aspect of the leg, in the depression anterior and distal to the head of the fibula. (WHO 2008)

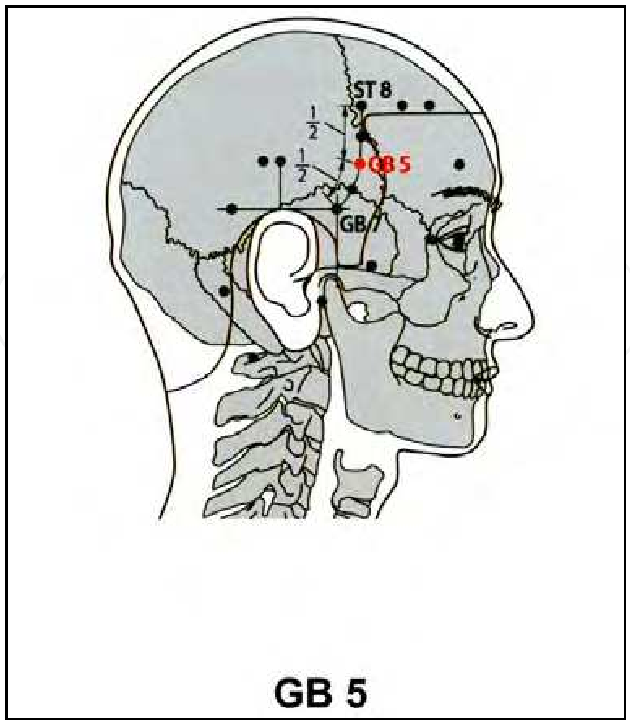


Fig. 4. Xuanlu (GB5). On the head, at the midpoint of the curved line from ST8 to GB7.

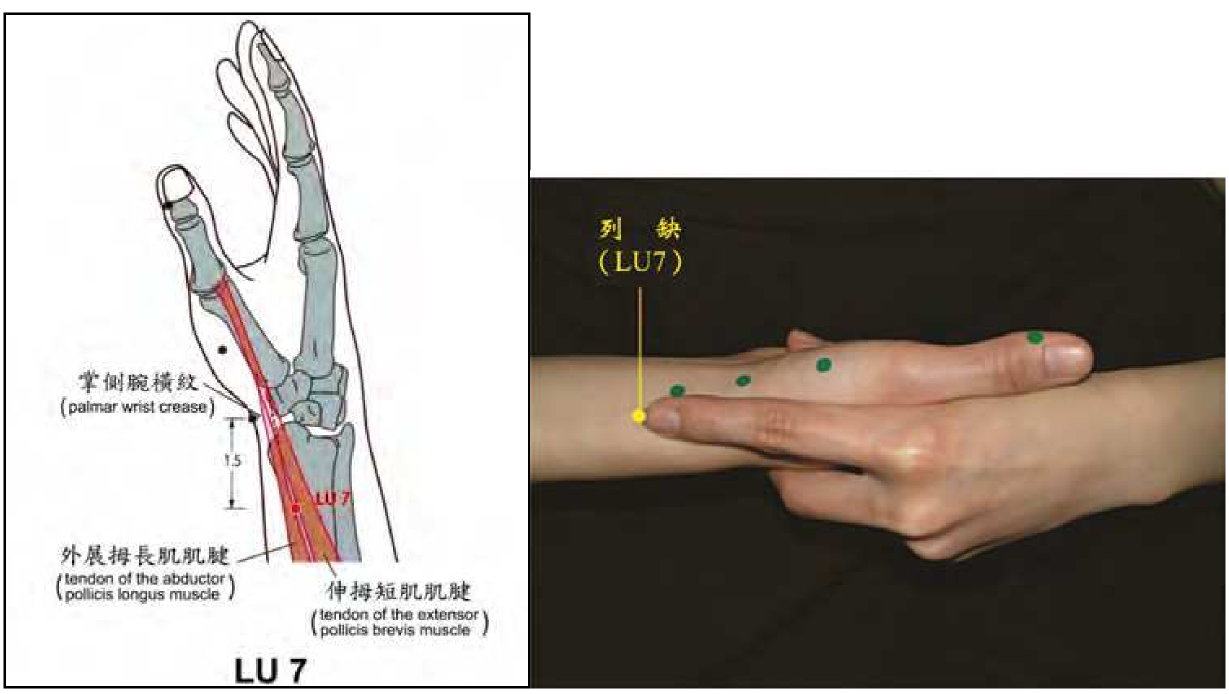
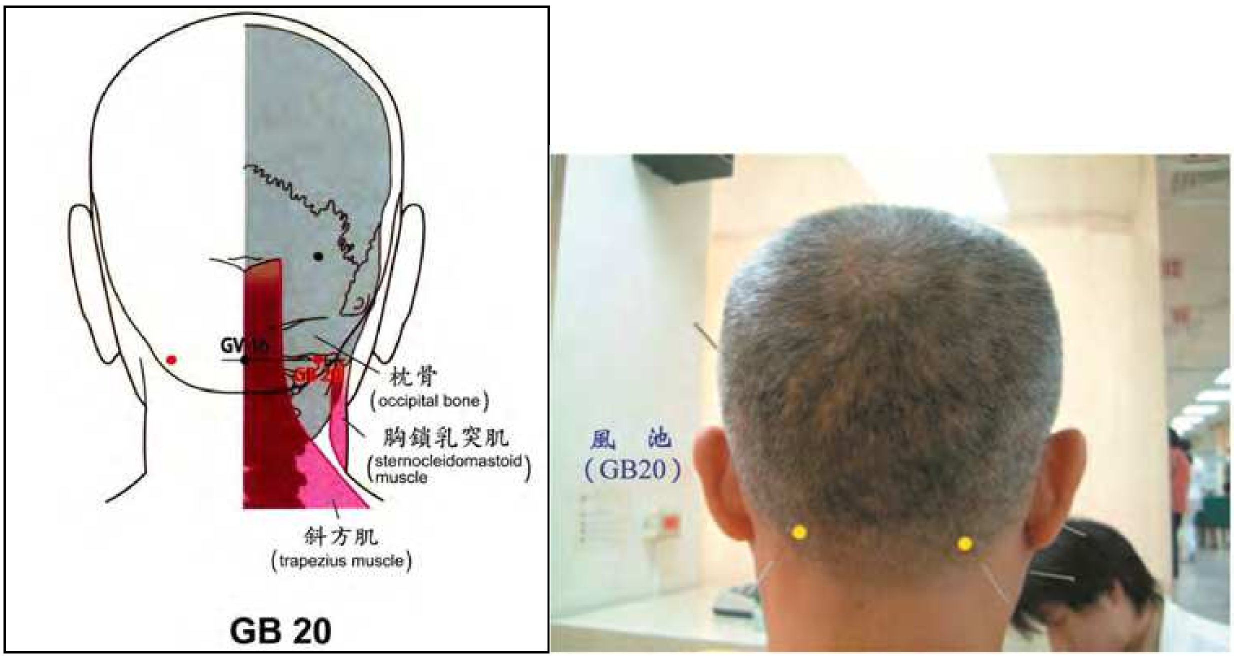


Fig. 5. Lieque (LU7). On the radial aspect of the forearm, between the tendons of the abductor pollicis longus and the extensor pollicis brevis muscles, in the groove for the abductor pollicis longus tendon, 1.5 B-cun superior to the palmar wrist crease. (WHO 2008)



Note: GB20 is at the same level as GV16.

Fig. 6. Fengchi (GB20). In the anterior region of the neck, inferior to the occipital bone, in the depression between the origins of sternocleidomastoid and the trapezius muscle. (WHO 2008)

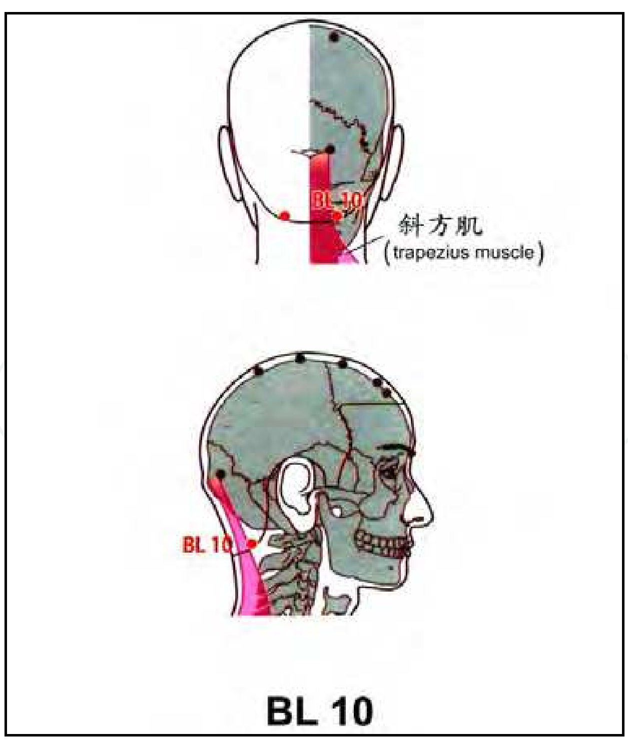
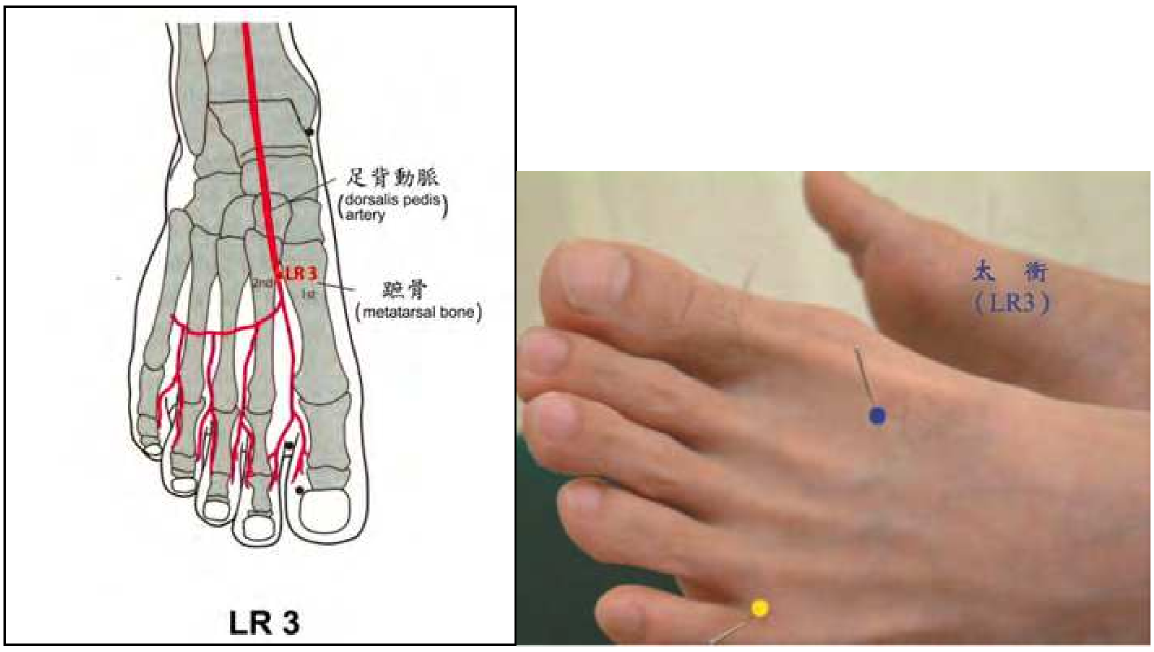
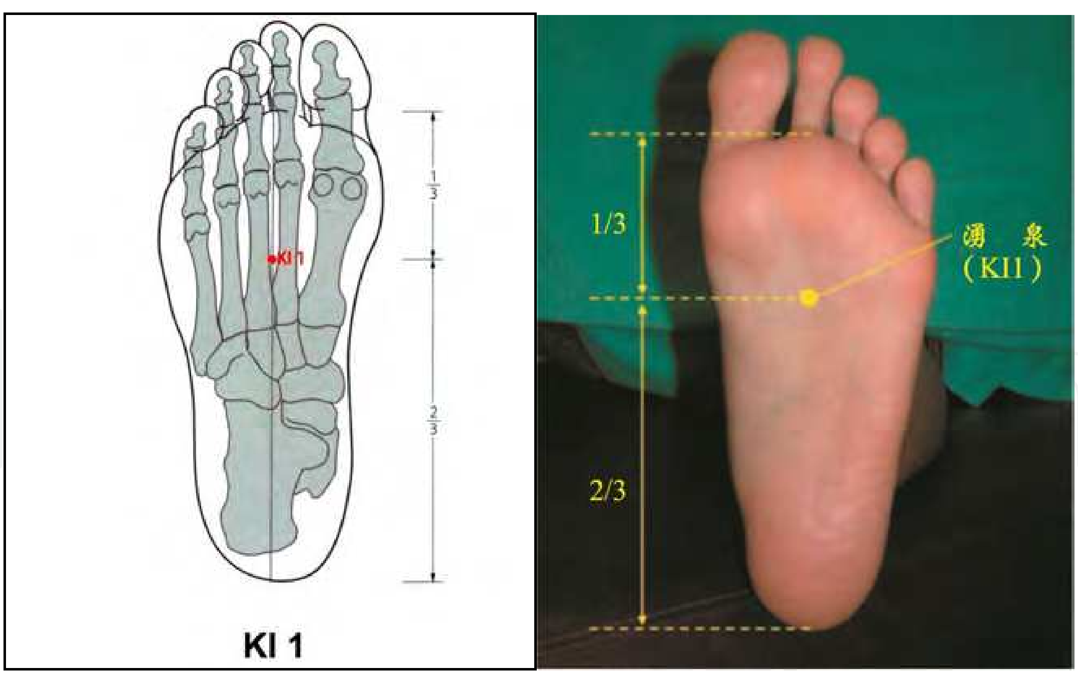


Fig. 7. Tianzhu (BL10). In the posterior region of the neck, at the same level as the superior border of the spinous process of the second cervical vertebra (C2), in the depression lateral to the trapezius muscle.(WHO 2008)



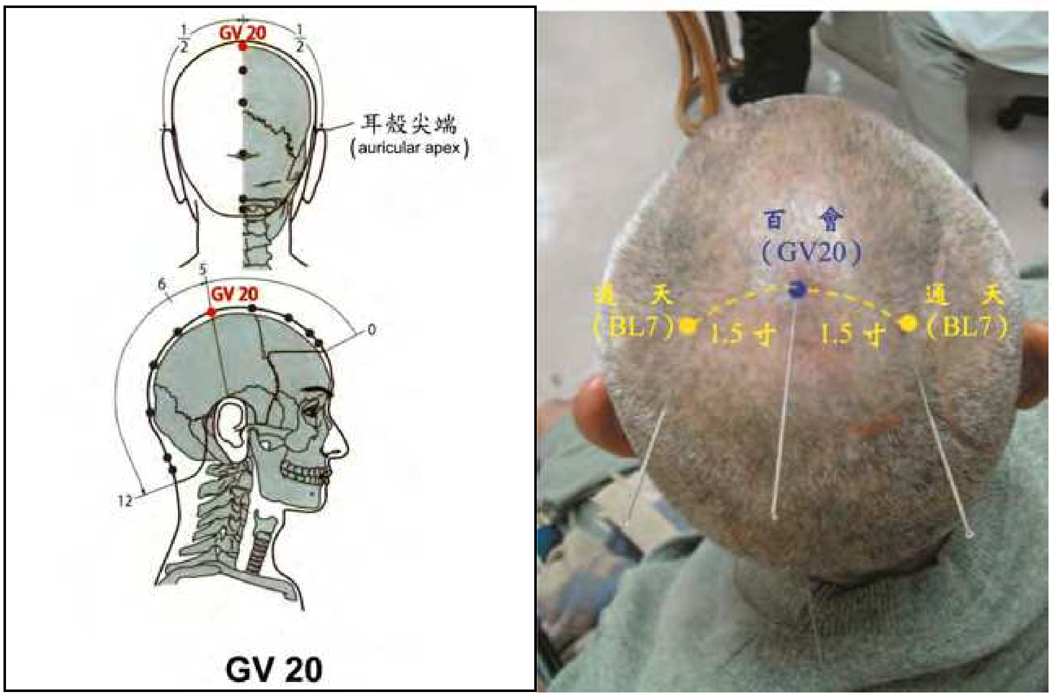
Note: LR3 can be felt in the depression when moving proximally from LR2 in the gap between the first and second metatarsal bones towards the base of two metatarsal bones

Fig. 8. Taichong (LR3). On the dorsum of the foot, between the first and second metatarsal bones, in the depression distal to the junction of the bases of the two bones, over the dorsalis pedis artery. (WHO 2008)



Note: When the toes are flexed, KI1 is located approximately in the depression at the junction of the anterior one third and the posterior two thirds of the line connecting the heel with the web margin between the bases of the second and third toes.

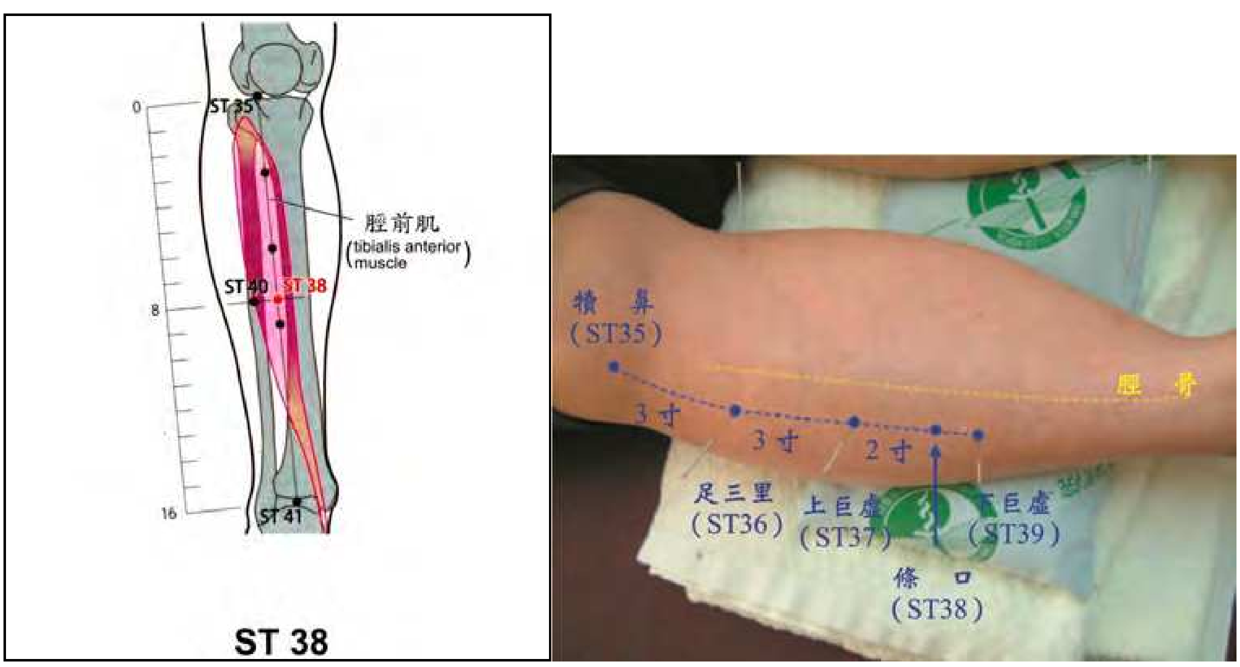
Fig. 9. Yougquan (KI1). On the sole of the foot, in the deepest depression of the sole when the toes are flexed . (WHO 2008)



Note 1: GV20 is located in the depression 1 B-cun anterior to the midpoint of the line from the anterior hairline to the posterior hairline.

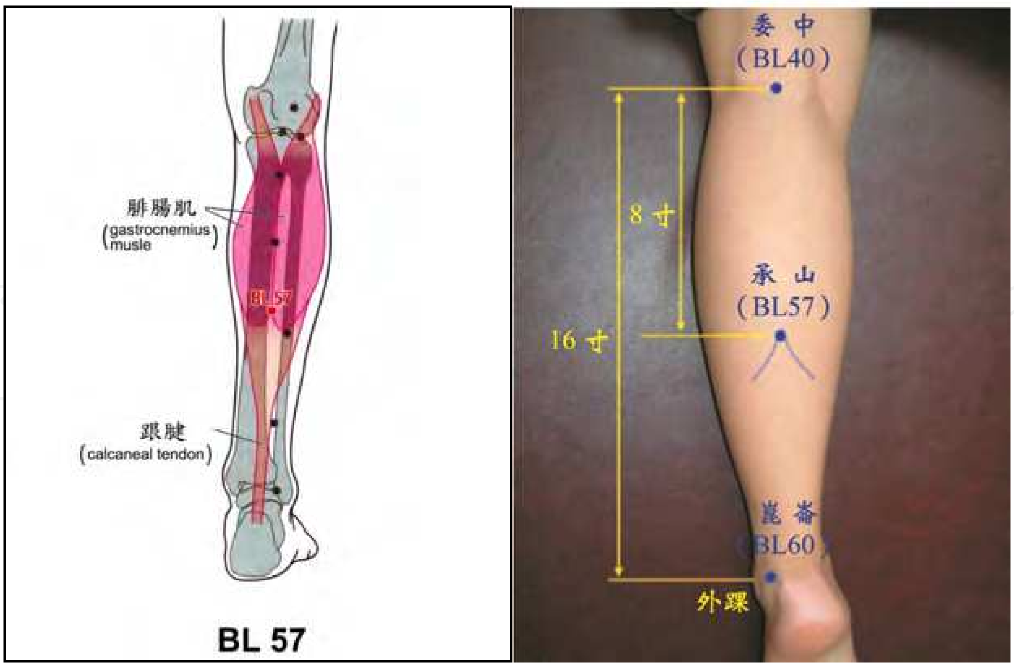
Note 2: When the ears are folded, GV20 is located at the midpoint of the connecting line between the auricular apices.

Fig. 10. Baihui (GV20). On the head, 5 B-cun superior to the anterior hairline, on the anterior median line. (WHO 2008)



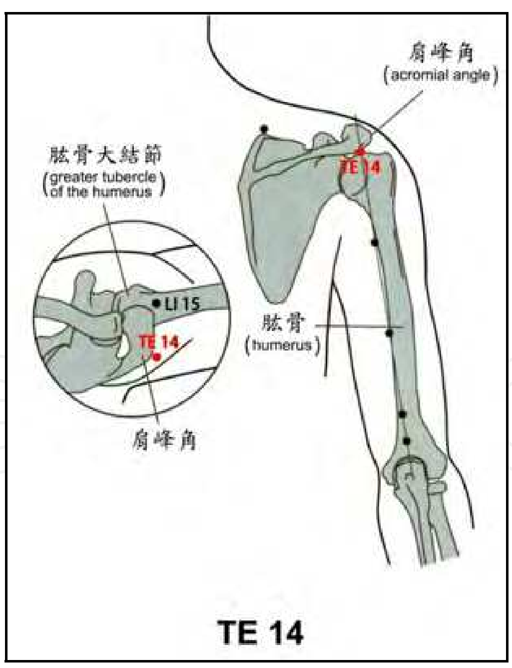
Note: ST38 is located on the tibialis anterior muscle, at the same level as ST40.

Fig. 11. Tiaokou (ST38) On the anterior aspect of the leg, on the line connecting ST35 with ST41, 8 B-cun inferior to ST35. (WHO 2008)



Note: With the leg stretched (plantar flexion) or the heel up, BL57 is located at the sharp angled depression inferior to the muscle belly of the gastrocnemius muscle. The two heads of the gastrocnemius muscle are separated to make a lambda shape (Λ)

Fig. 12. Chengshan (BL57). On the posterior aspect of the leg, at the connecting point of the calcaneal tendon with the two muscle bellies of the gastrocnemius muscle. (WHO 2008)



Note: When the elbow is flexed and the arm is abducted, two depressions appear respectively anterior and posterior to the acromion. LI15 is located in the anterior one, deeper than the posterior one, in which TE14 is located.

Fig. 13. Jianliao (TE14). On the shoulder girdle, in the depression between the acromial angle and the greater tubercle of the humerus. (WHO 2008)

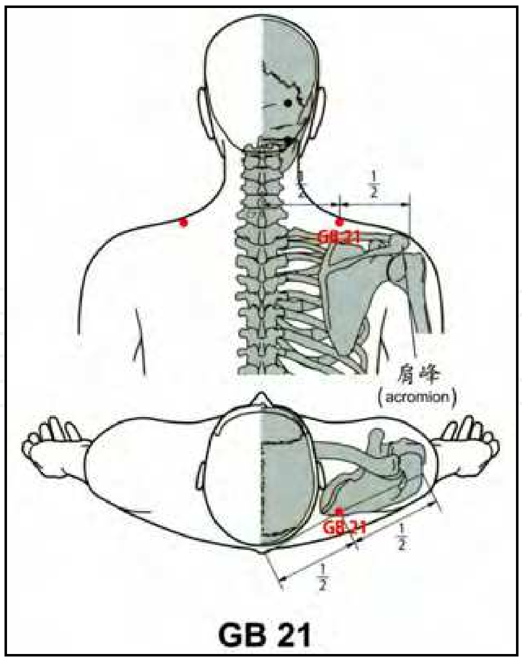
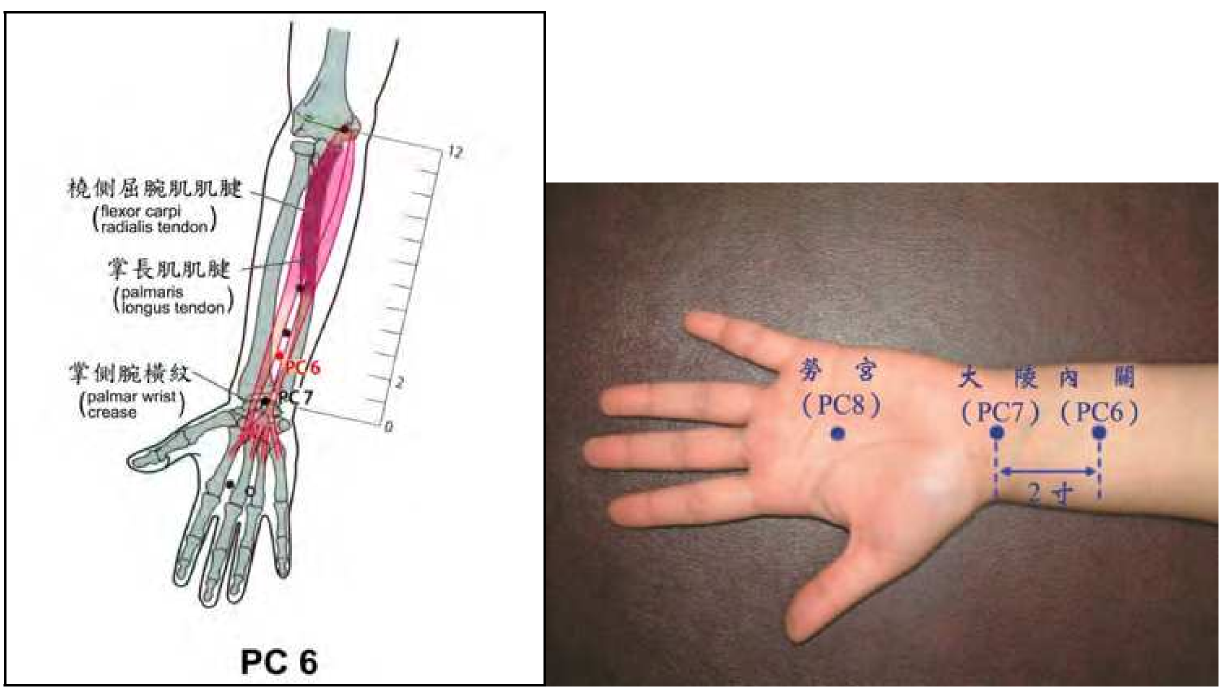


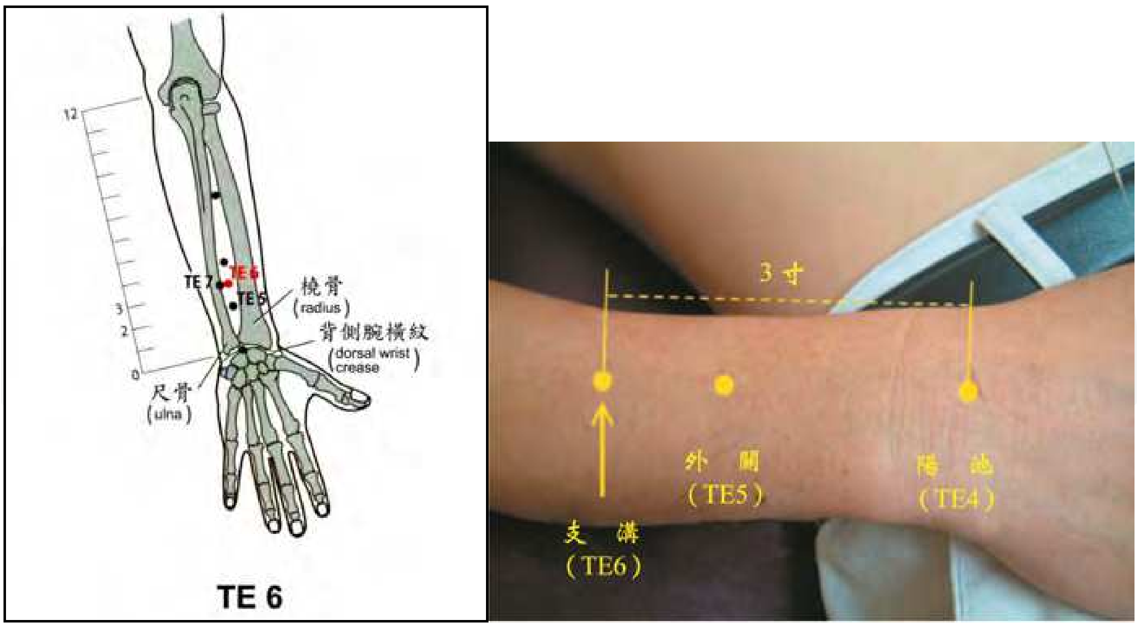
Fig. 14. Jianjing (GB21). In the posterior region of the neck, at the midpoint of the line connecting the spinous process of the seventh cervical vertebra (C7) with the lateral end of the acromion.(WHO 2008)



Note 1: With the fist clenched, the wrist supinated and the elbow slightly flexed, the two tendons become more prominent. PC6 is located 2 B-cun proximal to PC7. The posterial point corresponding to PC6 is TE5.

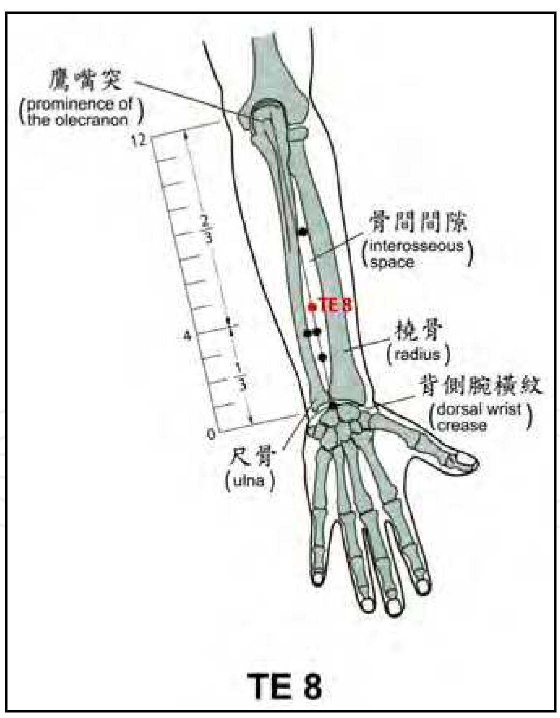
Note 2: If the palmaris longus tendon is not present, PC6 is medial to the flexor carpi radialis tendon.

Fig. 15. Neiguan (PC6). On the anterior aspect of the forearm, between the tendons of the palmaris longus and the flexor carpi radialis, 2 B-cun proximal to the palmar wrist crease. (WHO 2008)



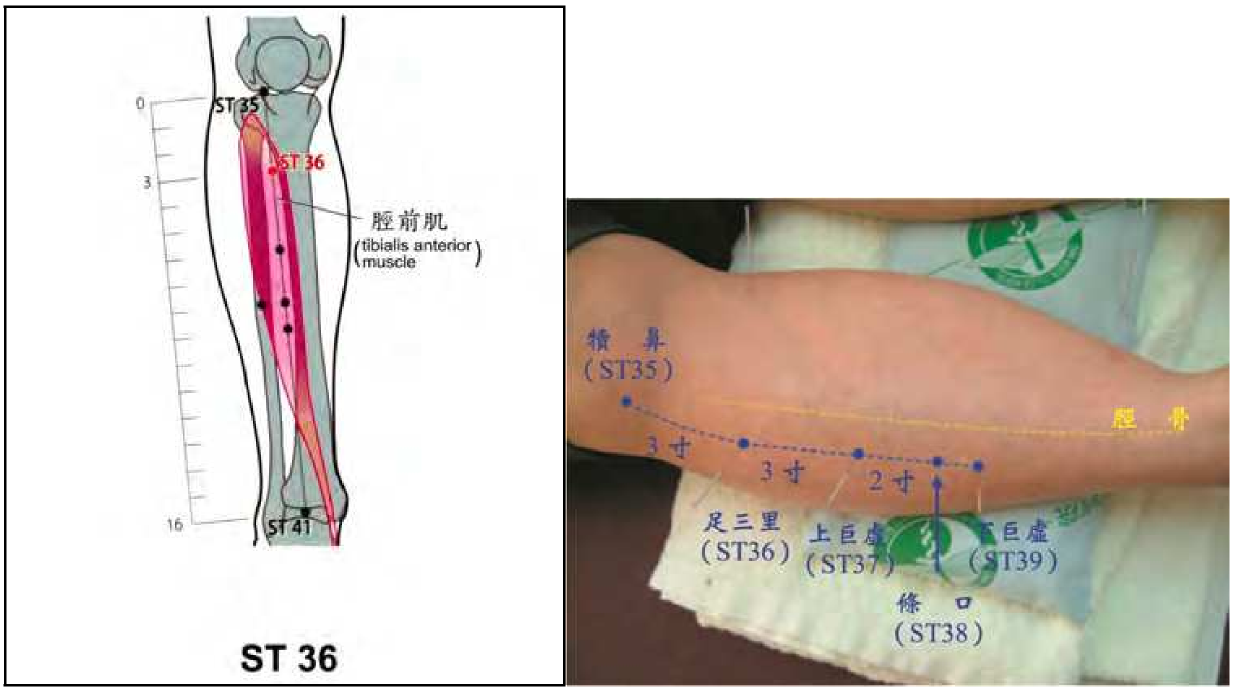
Note: 1 B-cun proximal to TE5, between the radius and the ulna, at the same level as TE7.

Fig. 16. Zhigou (TE6). On the posterior aspect of the forearm, midpoint of the interosseous space between the radius and the ulna, 3 B-cun proximal to the dorsal wrist crease. (WHO 2008)



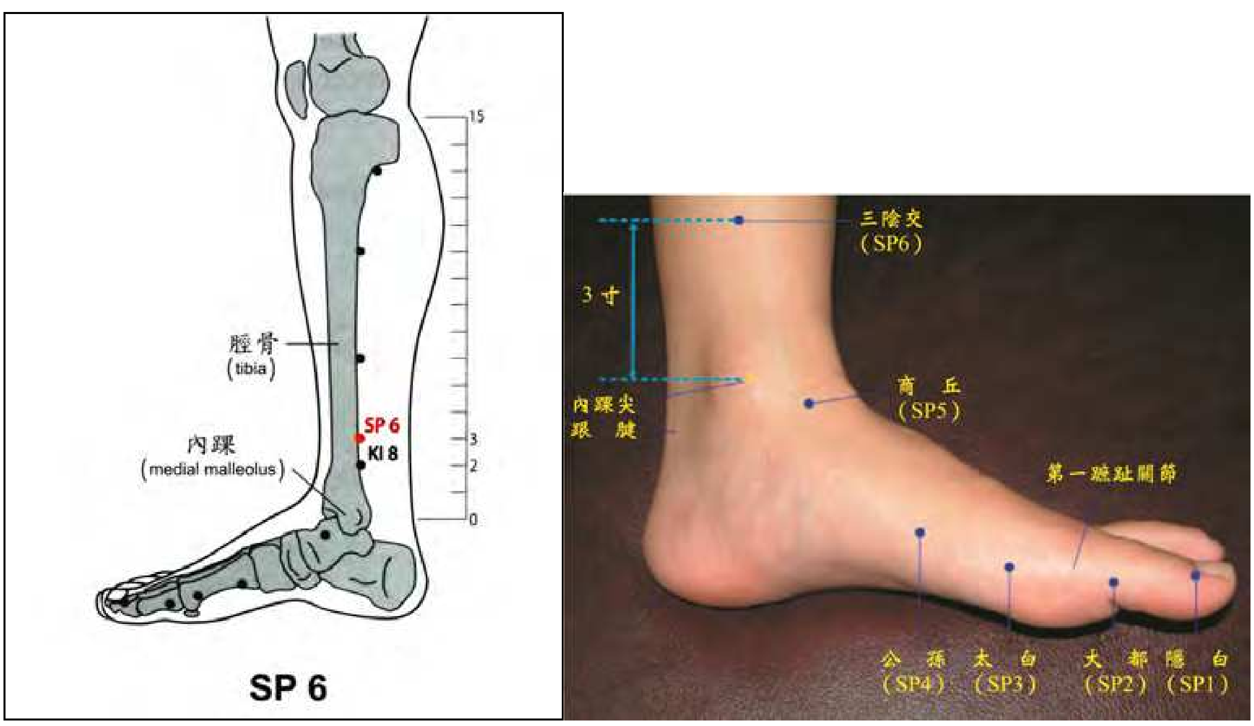
Note: At the junction of the upper two thirds and lower one third of the line connecting TE4 with the tip of the elbow.

Fig. 17. Sanyanglou (TE8) On the posterior aspect of the forearm, midpoint of the interosseous space between the radius and the ulna, 4 B-cun proximal to the dorsal wrist crease. (WHO 2008)



Note: ST36 is located on the tibialis anterior muscle.

Fig. 18. Zusanli (ST36). On the anterior aspect of the leg, on the line connecting ST35 with ST41, 3 B-cun inferior to ST35. (WHO 2008)



Note: 1 B-cun superior to KI8.

Fig. 19. Sanyinjiao (SP6).On the tibial aspect of the leg, posterior to the medial border of the tibia, 3 B-cun superior to the prominence of the medial malleolus. (WHO 2008)

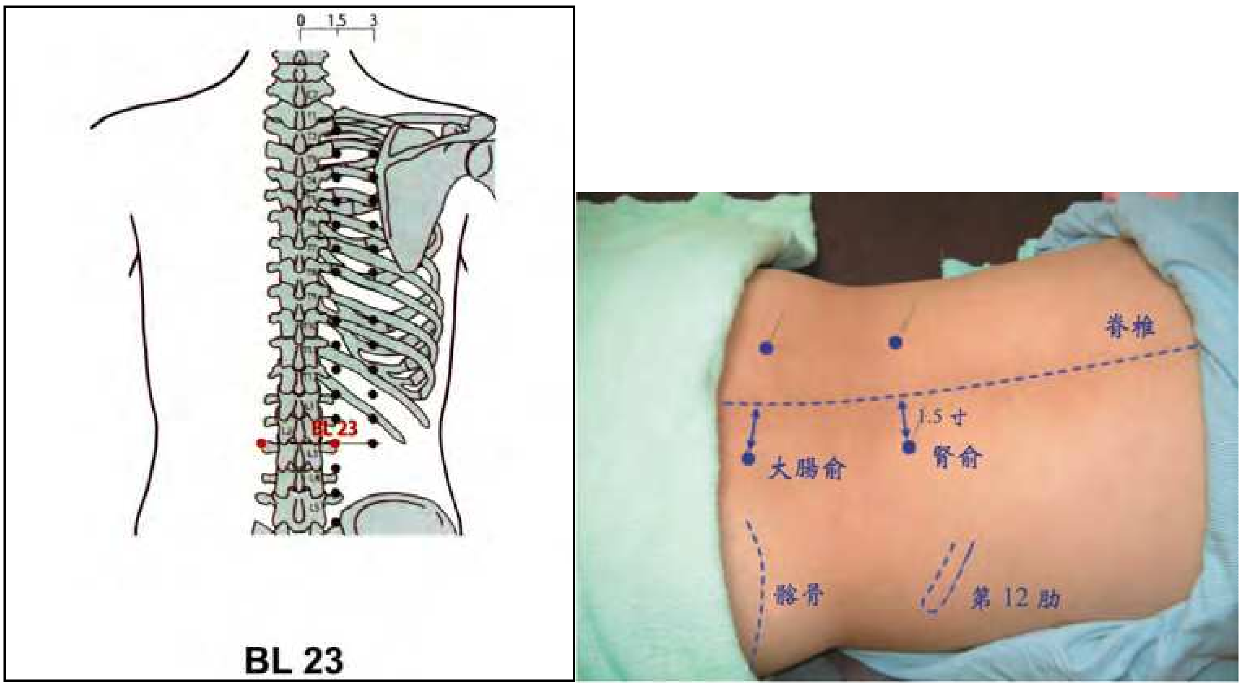


Fig. 20. Shenshu (BL23). In the lumbar region, at the same level as the inferior border of the spinous process of the second lumbar vertebra (L2), 1.5 B-cun lateral to the posterior median line. (WHO 2008)

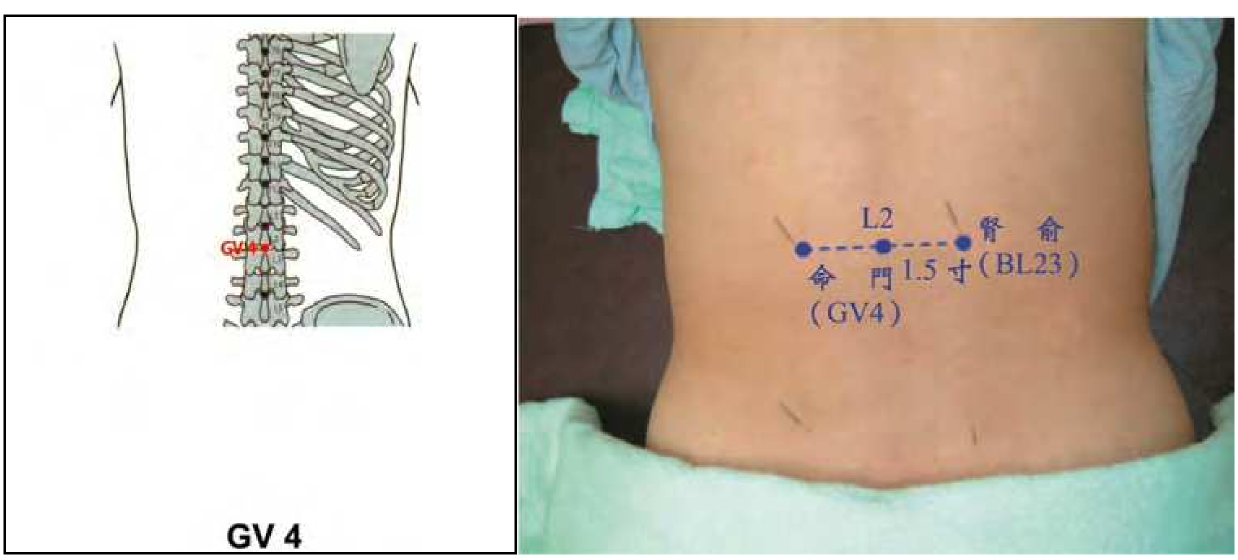


Fig. 21. Mingmen (GV4) In the lumbar region, in the depression inferior to the spinous process of the second lumbar vertebra (L2), on the posterior median line.(WHO 2008)

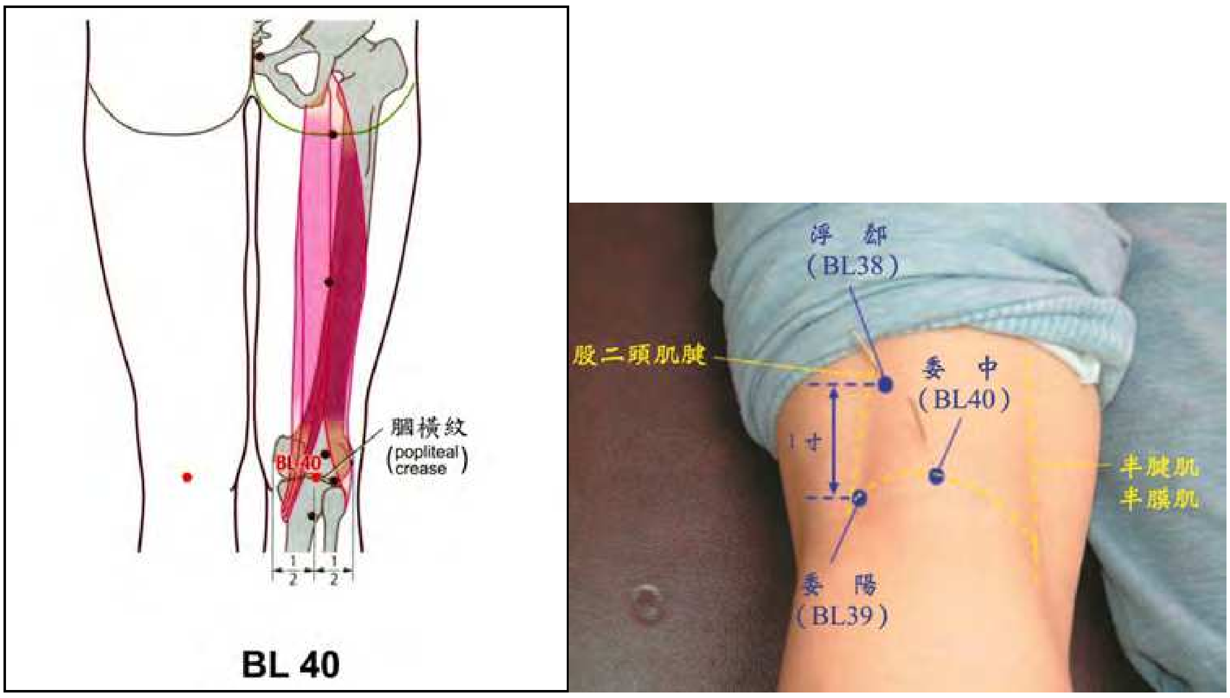
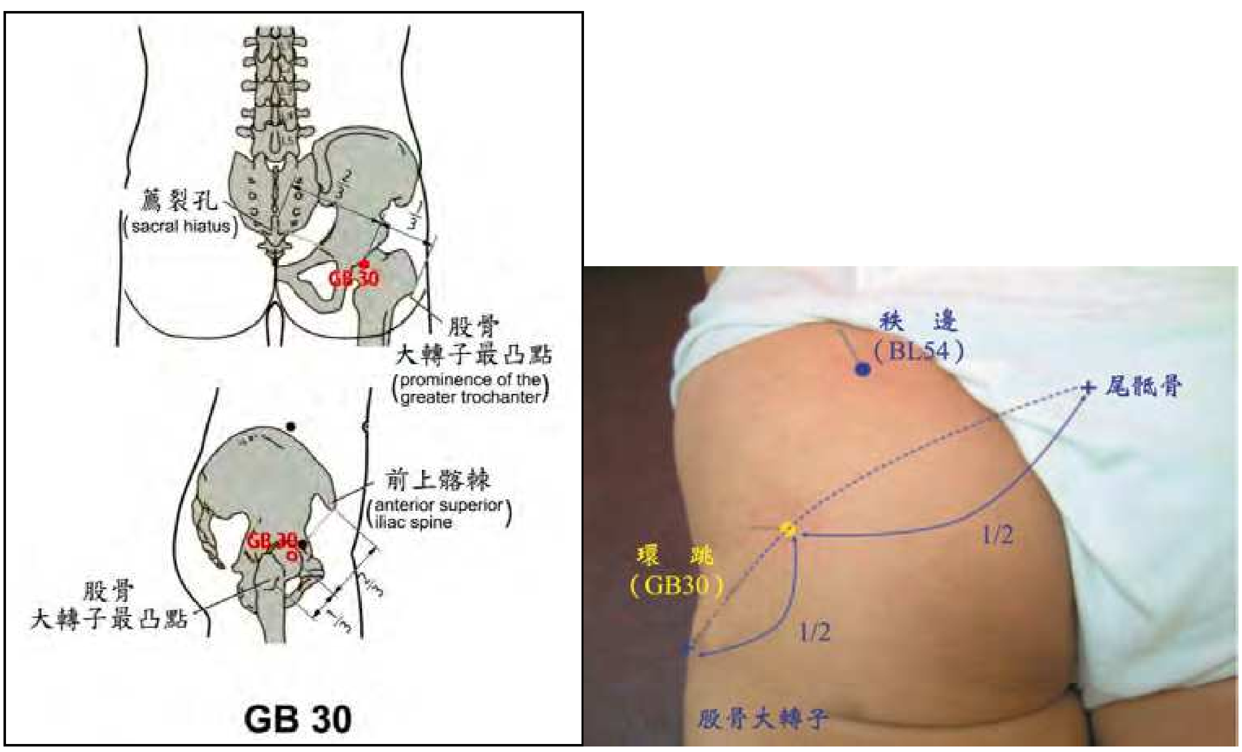


Fig. 22. Weizhong (BL40). On the posterior aspect of the knee, at the midpoint of the popliteal crease. (WHO 2008)

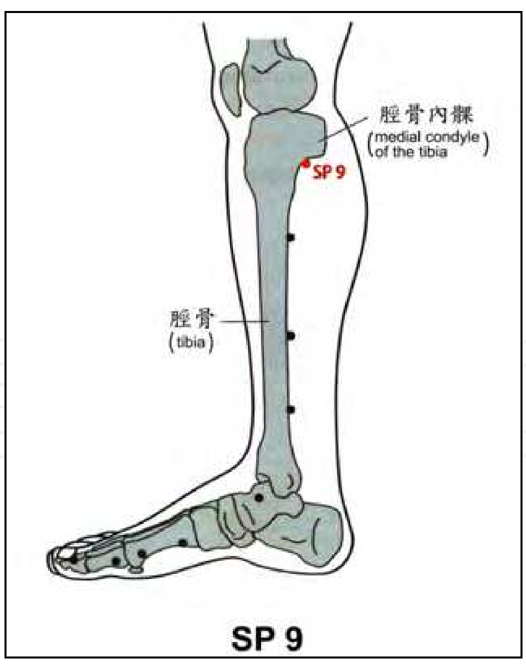


Note: GB30 is easier to locate when the subject is lying on the side with the thigh flexed. (WHO 2008)

Fig. 23. Huantiao (GB30). In the buttock region, at the junction of the lateral one third and medial two thirds of the line connecting the prominence of the greater trochanter with the sacral hiatus.

Remarks: Alternative location for GB30- In the buttock region, at the junction of the lateral one third and medial two thirds of the distance between the prominence of the greater trochanter and the anterior superior iliac spine.

Fig. 24. Kunlun (BL60). On the posterolateral aspect of the ankle, in the depression between the prominence of the lateral malleolus and the calcaneal tendon. (WHO 2008)



Note: A depression can be felt inferior to the knee joint when moving proximally along the medial border of the tibia. SP9 is located in a depression at the angle formed by the inferior border of the medial condyle of the tibia and the posterior border of the tibia. (WHO 2008)

Fig. 25. Yinlingquan (SP9). On the tibial aspect of the leg, in the depression between the inferior border of the medial condyle of the tibia and the medial border of the tibia.

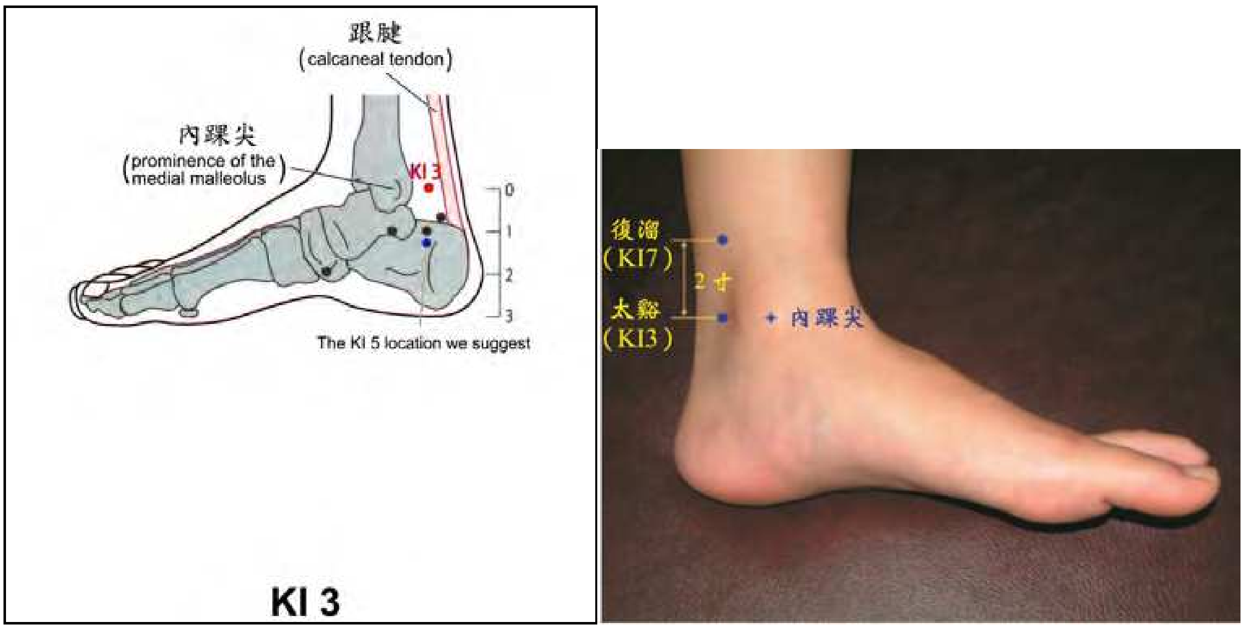


Fig. 26. Taixi (KI3). On the posteromedial aspect of the ankle, in the depression between the prominence of the medial malleolus and the calcaneal tendon. (WHO 2008)

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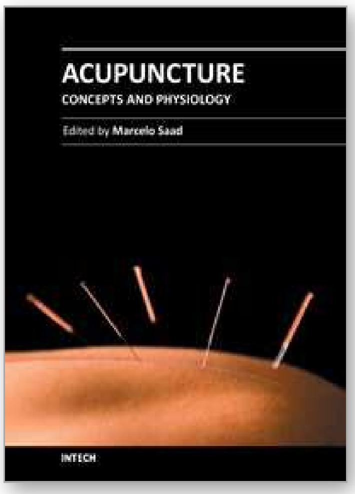

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Acupuncture and related techniques are useful tools for treating a spectrum of diseases. However, there are still many areas of controversy surrounding it. We hope this book can contribute to guide the advance of this ancient medical art. In the present work, the reader will find texts written by authors from different parts of the world. The chapters cover strategic areas to collaborate with the consolidation of the knowledge in acupuncture. The book doesnâ€™t intend to solve all the questions regarding this issue but the main objective is to share elements to make acupuncture more and better understood at health systems worldwide.

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