

## Exploring the Basis for Tai Chi Chuan as a Therapeutic Exercise Approach

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For many centuries Tai Chi has been a martial art form, practiced primarily in Oriental cultures. For the past 300 years this movement approach has been used as an exercise form, practiced by millions of Chinese elderly people. To date, virtually no information exists about the therapeutic elements of this intriguing movement sequence. This article provides a historical review of existing documentation of reputed Tai Chi benefits. The 108 "forms" of Tai Chi Chuan are reduced to 10 composite forms for ease of application of these forms to older individuals within a reasonable time frame. An effort is set forth to identify the potential therapeutic elements within these forms.

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**P**RACTITIONERS OF Chinese medicine believe that all elements in the universe are contained in a primordial, potential energy, known as Tao. Tao is believed to be a universal unifying principle from which emerged bipolar energy forces, called Yin and Yang. These forces represent negative and positive concepts from which complexity in worldly matters are manifest. In Traditional Chinese Medicine, health is contingent upon the balance between Yin and Yang. Imbalances in these energy forces are thought to produce physical dysfunction that may lead to poor health. If nutritional intake is poor, the environment is unpleasant, mental attitude is contaminated, and lifestyle is corrupted, the ability to satisfactorily replenish the energy sources and assure a balanced flow throughout the body is compromised.

Tai Chi (TC), also called Tai Chi Chuan, Tai Chi Quan, Taijiquan, or T'ai Chi, was devised more than 300 years ago in the late Ming and early Qing dynasties of China. Tai Chi, meaning "supreme ultimate," and Chuan, meaning "fist," was first perceived as a form of shadow boxing<sup>1</sup> and was subsequently transformed into a martial art in an effort to ward off foreign invaders or to suppress peasant insurrections.<sup>2</sup> The

unique attribute of TC necessitated subduing the aggressive advances of an enemy through a soft flow of movement designed to dissipate force through or past one's own body. Throughout the positioning of a practitioner's pose, movement could be either energetic or gentle, with a slow, rhythmic harmony characterizing the rate of movement. TC is an important feature of the traditional Chinese approach to health and is associated with enhancing a sense of well-being and health. It is designed to promote a smooth and balanced flow of energy throughout the body and has become popular among Chinese elders who wish to better control bodily movements and to be more aware of the space through which they move during practice or in real life situations.

Over the years, the emphasis in TC became far more focused on body environment and mind-body interactions than as a martial art. By 1956, a meeting of TC masters, convened by the Chinese National Athletic Committee, had produced a "combined" form of TC designed to convey the best components of the various TC schools, such as the Yang, Chen, Sun and Yin approaches, that had evolved over the previous centuries.<sup>3</sup> Despite this combined form, the individual approaches remain very distinct but continue to share in common the belief that TC arose from opposing forms of Yin (inactivity) and Yang (activity). Furthermore, all TC movements seek to balance Chi (vital energy) in the body's meridians and continued practice strengthens this vital energy, consequently reducing the potential for serious illness.

The current practice of TC has evolved into relaxed, smooth, and graceful movements. All TC forms tend to operate on three basic principles.<sup>4</sup> First, the body should be extended and relaxed. Awareness of trunk alignment and deep breathing are necessary prerequisites to achieve a proper posture before forms can be practiced and learned. Second, the mind must be alert but calm as one becomes more aware of the presence and movement of the body within its own space. Last, all body movements require well-coordinated sequencing of segments. Awareness of this sequencing originates through body loci at the waist and upper hips, with movement initiated in the half-squat position and progressing to the distal limbs.

Against this historical perspective, a well-documented contemporary accounting of TC in numerous lay magazines attests to its almost ritualistic use by Chinese elderly. Long-lasting physiological, psychological, and social benefits accrue through regular practice. Many public forums promote the practice of the exercise form for people of all ages. When or how older individuals began using TC is uncertain. Most probably this occurrence was not sudden but rather a naturally occurring evolution as lifelong TC practitioners simply continued this activity while drawing notice because of their continued good health.

Only recently has attention been given by Western science to the benefits of TC to the health of people living in Western cultures. Our health care systems are faced with increasing expenditures for chronic disease and disability. The creation of novel approaches to enhance the well-being of people destined to frequent rehabilitation medicine clinics seems imperative. TC has the potential to offer more than a group exercise form to

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**Table 1: Changes in Various Measures Resulting From TC Practice in People Older Than 60 Years of Age**

Condition	Persons Older Than 60yrs (TC)	Persons Older Than 60yrs (Sedentary)
Occurrence of spondylitis (%)	23.8	47.2
Occurrence of osteoarthritis (%)	14.3	79.4
Bone density (vertebral column)	"Normal"	"Not good"
Occurrence of degeneration/deconditioning (%)	25.8	47.2
Ability to touch the floor with hands (%)	85.7	20.6
Average resting systolic blood pressure (mmHg)	134	154
Incidence of developing atherosclerosis (%)	37.5	46.4
Sit-stand 20 times in 30 seconds (%)	No abnormal heart beats	35 abnormal heart beats
High density lipoprotein (mg)	Reduced by 14.5	No change

obviate expenditures associated with poor health by facilitating a lifestyle that promotes wellness among people of all ages. Before endorsing this historic practice, several relevant questions must be explored. What evidence exists that TC affords any benefits? From a preventative or rehabilitative perspective, what therapeutic principles might underlie its use? What impact might TC practice by older individuals have on relevant clinical behaviors, such as balance control or injurious falls? The purposes of this article, then, are to: (1) provide information about this intriguing form of exercise by critically reviewing existing evidence for the benefits of TC, and (2) identify the therapeutic elements that formed the basis for the successful application of TC in a recent clinical trial.<sup>5</sup>

## RELEVANT STUDIES ON TC

### Literature From China

Perhaps the most appropriate way to approach a cursory review of TC literature is through a chronological survey that begins with studies performed in China. The earliest available accounts of benefits derived from TC can be extracted from translation of the Chinese literature. Precision of experimental methods and available controls are difficult to ascertain. Gong and coworkers<sup>6</sup> were unable to demonstrate a change in heart rate with TC practice and concluded that this form of exercise did not provide cardiovascular conditioning. Specifics regarding exercise intensity were not provided. On the other hand, data from the Sports and Exercise Building Group of China<sup>7</sup> and the An Wei Science and Technology Publication,<sup>8</sup> summarized in the upper and lower portions, respectively, of table 1 indicate that regular practice of TC can have positive effects on people older than 60 years of age. Neither specific delineation of measurement techniques nor accuracy (reliability) of measures related to "conditions" was reported.

Among other Chinese studies, the People's Sports and Exercise Publication<sup>9</sup> reported that grip strength in TC practitioners, aged 70 to 79, was 32.8% greater than identical measures taken from a non-TC practice group ranging in age from 50 to 59 years. In addition, after one year of TC training, 83.2% of these elderly trainees could undertake "house chores" that they were not capable of completing before training. Ninety-two percent of TC trainees could achieve "normal" blood pressure within 3 minutes of completing a 30-second, 20-repetition sit-to-stand exercise compared with 22.4% of the nonexercise group. Air exchange for these two groups was 79L/min and 64.3L/min, respectively. Another study<sup>10</sup> evaluated behavioral changes

among TC practitioners older than 70 years. Among a sedentary, age matched group, 76.1% demonstrated (unspecified) behavioral test outcomes indicative of anxiety, anger, sadness, depression, and loneliness, whereas 92.3% of the TC group showed "substantial" improvement on measures (unspecified) of friendliness, pleasantness, and socialization.

### First American Publications on the Benefits of TC

The first publication in American literature about TC was a self-report by Koh,<sup>11</sup> an Australian physician who began TC exercise 15 years after being diagnosed with ankylosing spondylitis. After 2 to 5 years of practice, Koh felt stronger and healthier, presumably had better balance, reduced blood pressure, and a decrease in daily indomethacin intake. Zhou and coworkers<sup>12</sup> studied the accrued benefits from practice with the "long form" of TC in which all 108 forms had been learned and practiced for 3 to 5 years by 11 participants (mean age, 28.4 years). Measurement of average energy costs allowed this exercise to be classified as moderate in intensity for this age group.

The first clinical study to incorporate a control group made use of the philosophical principles inherent in TC.<sup>13</sup> Specifically, patients with rheumatoid arthritis were taught a dance program using flowing, relaxed movement. Breathing and postural awareness were also stressed. Compared to a control group, the dance exercise group had significantly greater upper extremity range of motion (ROM) 4 months after completing the program and expressed "significantly higher" reports of enjoyment. A more recent study<sup>14</sup> confirmed that TC practiced once or twice a week for 10 weeks by patients with rheumatoid arthritis led to no further deterioration in their rheumatic disease compared to a control group of patients.

### Impact of TC on Cardiorespiratory Activity

Cardiorespiratory responses to training have also been examined in more detail. Brown and coworkers<sup>15</sup> examined ventilatory and cardiovascular responses to use of the TC long form by six experienced TC practitioners (ages unspecified) and found significantly lower ventilatory frequency, ventilatory equivalent, and the ratio of dead space ventilation to tidal volume compared with similar measures made on these individuals during cycle ergometry. TC experts therefore show different ventilatory responses, suggesting better use of ventilatory volume than would be anticipated from comparable exertional levels on a cycle ergometer. Similar findings were obtained by Schneider and Leung<sup>16</sup> from 20 male martial arts experts (age unspecified) from both TC and a defensive exercise called Wing Chun. TC practitioners showed significantly lower ventilatory equivalent for oxygen, suggesting that TC may yield more efficient breathing patterns than Wing Chun.

A study by Jin<sup>17</sup> showed that among 33 TC practitioners, compared with 33 beginners (total group age range, 16 to 75), TC increased heart rate, increased noradrenaline exertion in urine, and decreased salivary cortisol concentration. These data are compatible with the notion that TC practice produces less tension, depression, fatigue, and state-anxiety. A subsequent study<sup>18</sup> among 96 experienced TC practitioners (estimated age range, 26 to 48 years) compared this exercise form to meditation, brisk walking, or neutral reading, as all participants were randomly assigned to one of these four groups. After respective interventions for 3 weeks, heart rate, blood pressure, and urinary catecholamine changes were comparable between TC and brisk walking (6km/h) groups. Lai and coworkers<sup>19</sup> made detailed physiological assessments on 49 practitioners, aged 50 to 64 years. TC consisted of a 20-minute warm-up period and 24

minutes of intense TC exercise, followed by a 10-minute cool-down period. Compared to a sedentary control group matched for age and gender, TC participants showed significantly higher  $\text{VO}_2$ ,  $\text{O}_2$  pulse, and work rate. Mean heart rate maximum exceeded 70% of maximum heart rate during TC exercise. TC practitioners had been engaged in this exercise form for more than 6 years. On 2-year follow-up,<sup>20</sup> the rate of decline in  $\text{VO}_2$ -max and  $\text{O}_2$  pulse was significantly less in the TC group than in the control subjects. Collectively, these data reinforce the belief that cardiorespiratory benefits for both younger and older people can be achieved over long-term, progressively more intense TC training.

### Impact of TC on Balance and Posture

Tse and Bailey<sup>21</sup> provided the first evaluation of the influence of TC training on balance. When comparing performance on five balance tests between TC practitioners ( $n = 9$ ; age range, 65 to 84 yrs) and nonpractitioners ( $n = 9$ ; age range, 66 to 86 yrs), the TC group did significantly better on three of the tests (right or left leg standing, eyes open, heel-toe walking).

In 1990 the National Institute on Aging and the National Center on Nursing Research of the National Institutes of Health funded the FICSIT (Frailty and Injuries: Cooperative Studies on Intervention Techniques) trials. Seven sites, working with a coordinating center, each examined novel interventions to improve frailty or reduce falls in older individuals and gathered data including physical, functional, behavioral, and environmental measures. Wolfson and coworkers<sup>22</sup> offered 3-month balance and strengthening, balance, strengthening, or education programs to 110 older community dwellers. The balance program improved all balance measures so that this subgroup achieved performance scores similar to people 3 to 10 years younger, and participants in the strengthening program showed significant increases in the generation of lower extremity isokinetic torques. Subsequently, all participants received a 6-month maintenance program consisting of weekly 1-hour group sessions of TC. The combined strength and balance group preserved some of the gains made during the intervention, as reflected in persistent improvement in single limb support time. Equally important, the other exercise groups preserved their respective balance and strength gains seen at the end of each intervention, suggesting that the relatively low intensity TC supplement over 6 months could justify a more intense future application. Wolf et al<sup>5</sup> also studied TC, but as one arm of a randomized group of interventions for older community dwelling individuals. Unlike the Connecticut FICSIT study,<sup>22</sup> the Atlanta group<sup>5</sup> employed TC immediately and condensed the 108 forms of TC to 10 forms. They compared specific biomedical changes in this group to individuals assigned to an educational (control for exercise) group (ED) or a group receiving computerized balance training (BT). Each intervention lasted 15 weeks with hourly sessions for the ED and BT groups while the TC group met for two hourly sessions but with a total instructional time equivalent to the former groups. All subjects were followed for 4 months after concluding their interventions, with falls surveillance continuing throughout the length of the FICSIT trial. Compared to ED or BT groups, TC reduced the onset to falls by 47.5% with concomitant significant improvements in fear of falling and other physiological and psychosocial measures. Before engaging in more detailed studies on TC or unequivocally advocating its use by older individuals as an exercise form, efforts should be made to examine which aspects of postural stability might be influenced by this exercise form.

First, however, it is necessary to understand the movement components in many of the TC forms or what therapeutic elements of potential benefit to older individuals may be contained therein.

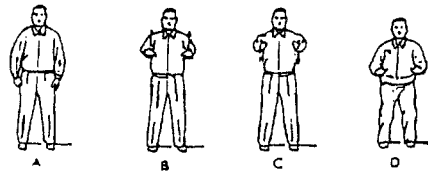
### EXPLORING THE THERAPEUTIC ELEMENTS OF TC

As part of the FICSIT trials,<sup>23</sup> we examined 108 forms contained within TC for their apparent movement components. In undertaking this work, all references made to movement forms applied to elderly subjects had been approved by the Human Investigations Committee at our university school of medicine. Levandowski and Leyshon<sup>24</sup> had compared the movement forms of TC to proprioceptive neuromuscular facilitation patterns and emphasized the reciprocal or opposing movements that categorize many forms, and Ng<sup>25</sup> had identified the value of postural alignment, relaxed shoulders, swinging elbows, and diaphragmatic breathing as essential elements in performing TC. Yet there had been no attempt to relate the actual movements to potential deficits in motion or posture often observed in older people. Based on extraction of movement components presented in relevant literature<sup>26-28</sup> and critical discussion among ourselves, we set out to identify therapeutic elements contained in TC<sup>29</sup> that were of potential benefit for elderly practitioners. We reasoned that observable alterations in posture, movement patterns, and gait among older individuals may be caused by varying degrees of (1) slowed movement, (2) reduced ROM, (3) reduced muscle strength, (4) increased flexed posture, (5) reduced rotational movements, especially in the trunk, (6) reduced arm swing, and (7) decreased unilateral weight shifts and stance times. In fact, as people age, axial movements,<sup>30,31</sup> and motions at the cervical spine<sup>32,33</sup> become more limited while trunk postural muscles tend to be more slowly engaged when upper extremity motions are made.<sup>34</sup>

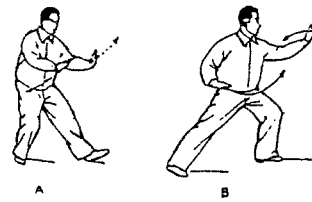
In addition to the low costs, ease of application, and great potential for socialization, TC exercise forms might also address some of these movement alterations, thus allowing an opportunity to improve balance, posture, gait, and perhaps even cardiorespiratory capabilities. Because of time limitations in executing a study on the use of TC, we condensed the 108 forms to 10 that could be learned by elderly subjects within 15 weeks, during which time total contact time and training were restricted to 2 hours per week. The 10 forms were selected because they (1) clearly represented progressive degrees of stress to postural stability, with weight bearing moving from bilateral to unilateral supports, (2) were easily comprehensible, and (3) seemed to emphasize increasing magnitude of trunk and arm rotation with diminishing base of support and, as such, were potentially taxing to postural stability.

Against this background we identified seven therapeutic elements that correspond numerically to the seven alterations in posture, movement, and gait, noted above. These elements are blended into the 10 forms (fig 1), either in total or in specified combinations and are as follows: (1) Continuous, slow movement may be slightly increased once mastered. (2) Small to larger degrees of motion are undertaken, depending on the ROM and strength characteristics of the individual. (3) Progressive flexion of the knees is performed to varying degrees with 70% of body weight generally on one leg, then shifting to the other leg so that the majority of lower extremity muscle strengthening would be expected during loading onto that limb. (4) Straight and extended head and trunk positioning is developed, a necessary prerequisite for promoting a less flexed posture. Consequently, rigorous attention is needed to prevent leaning of the

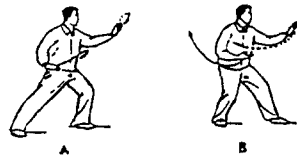
**FORM 1. OPENING FORM**



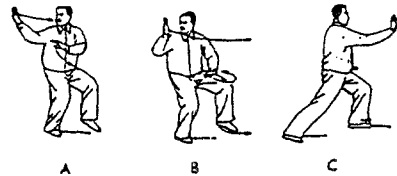
**FORM 6**



**FORM 2**



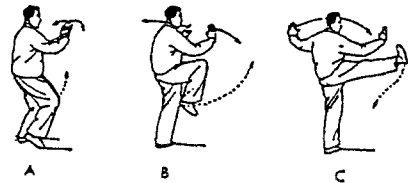
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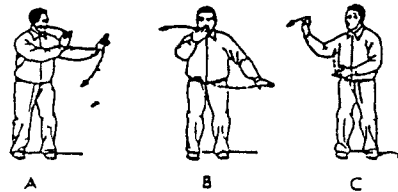
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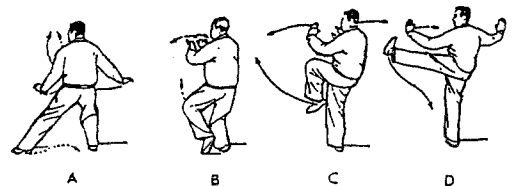
**FORM 8**



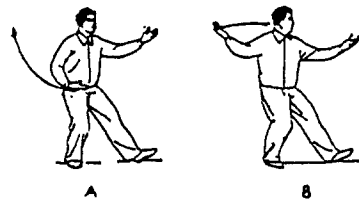
**FORM 4**



**FORM 9**



**FORM 5**



**FORM 10**

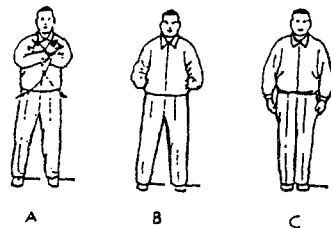


Fig 1. Pictorial representations of the 10 forms sequenced by their progressive difficulty in terms of increasing arm and body rotation and decreasing bar of support. See Appendix for more details.

trunk or protrusion of the sacrum. (5) Trunk, head, and extremity rotation is emphasized in all but the first and last exercise forms. Movements are done in circles, especially in the upper extremities, and require a strong rotational component. The eyes often follow the hand movements, thus promoting head and trunk rotation through eye movements.<sup>35,36</sup> (6) Symmetrical and diagonal arm and lower extremity movements are used as a major part of the selected forms, not only to promote arm swing in gait but also to increase trunk rotation around the waist. (7) Constant shifting to and from the right and left legs emphasizes progressively more displacement of body mass (Forms 2 to 9)

to develop skill at ultimately achieving unilateral weight and balance through self-awareness of limitations in postural stability. The exact directions and therapeutic elements for each form are presented as an Appendix.

Assuming that these therapeutic elements represent a reasonable first approximation of how TC practice might have a favorable impact on the health of older people, previous observations<sup>5,21,22</sup> must now be extended to see just how long-term control over balance might be affected with more extensive training and whether the application of these forms can alter the frequency or severity of falls-related behaviors. Seeking

answers to these questions within a group of independent community dwelling older individuals is particularly intriguing because some TC experts have argued that this exercise requires months, if not years, of practice to be of value.

### SUMMARY

TC is a time-honored martial art form that has gained recognition as an exercise for older people. The literature reveals ample reason for why TC offers multiple cardiopulmonary, musculoskeletal, and postural benefits among its practitioners. At present, initial efforts have been made to identify components of movement, posture, or gait alterations in aging individuals. For each of these alterations we have extracted possible therapeutic elements, which we apply to 10 of the 108 forms of Tai Chi Chuan. These 10 forms represent a reasonable number to teach an older TC student group with typical time constraints. Data presented elsewhere<sup>5</sup> suggest that this approach would be worthwhile for at least older individuals living independently within the community. Determining the ultimate value of TC as an exercise form to promote wellness for both younger and older individuals, however, necessitates controlled clinical studies that examine biomedical, behavioral, functional, and socioeconomic outcomes subjected to critical evaluation. If TC can be shown to maintain or enhance ability and reduce impairments, then its potential value to rehabilitation clinicians will become self-explanatory. In the interim, there is a clear challenge to practitioners of Western medicine to explore the effectiveness of this time-honored exercise.

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### APPENDIX: DIRECTIONS AND THERAPEUTIC ELEMENTS FOR LEARNING 10 FORMS OF TC

#### FORM 1. Directions

- Stand upright with feet shoulder-width apart, toes pointing forward, arms hanging naturally at sides. Look straight ahead (1A).
- Raise arms slowly forward to shoulder level, palms down.

The hands do not go above the shoulders and the elbows are held in (1B & 1C).

- (3) Bend knees as you press palms down gently, with elbows dropping towards knees. Look straight ahead (1D).

#### **FORM 1. Therapeutic elements 3, 4**

This "warmup" form begins with nonstressful bilateral stance where all thoughts other than those about movement clear the head. Attention is directed to relaxing all muscles except those of the legs—the feet are to "stick to the ground." As movement begins, concentration is directed to move all four extremities at the same constant speed that begins and ends concomitantly in the arms and legs.

#### **FORM 2. Directions**

The body is turned slightly to the left, with left foot at 9 o'clock for a left bow stance. The left forearm and back of hand are at shoulder level, while right hand is at the side of right hip, palm down. Look at left forearm (2A). Turn torso slight to left (9 o'clock) while extending left hand forward, palm down. Turn torso slightly right while pulling both hands down in a curve past abdomen, until right hand is extended sideways at shoulder level, palm up, and left forearm is across chest, palm turned inward. Shift weight onto right leg. Look at right hand (2B).

#### **FORM 2. Therapeutic elements 1-7**

The trunk and head rotate while both feet remain on floor. The arms move in asymmetrical positions so that the center of mass is extended further from left to right due to arm positions. The trunk and head are kept erect so that rotation is around a central axis. The body weight is predominantly on a flexed leg for greater balance and strength mechanism.

#### **FORM 3. Directions**

Look straight ahead, face 9 o'clock with weight on left leg in a bow stance and hands forward at shoulder height in a pushing position (3A). Turn both palms downward as right hand passes over left wrist, moves forward, then to the right until it is on the same level with left hand. Separate hand shoulder-width apart and draw them back to the front of abdomen, palms facing obliquely downward. At the same time, sit back and shift weight onto right leg, slightly bent, raising toes of left foot. Look straight ahead (3B & 3C).

#### **FORM 3. Therapeutic elements 1-4 & 7**

The body center of mass moves diagonally posteriorly than other forms with a decreased base of support from only heel contact of the left leg, demanding greater balance and strength than the previous form. The trunk rotation is decreased and the arm movement is symmetrical.

#### **FORM 4. Directions**

Turn torso to the left (10-11 o'clock), shifting weight to left leg. Move left hand in a curve past face with palm turned slowly leftward, while right hand moves up to the front of left shoulder with palm turned obliquely inward. As right hand moves upward, right foot and left foot are parallel and 10 to 20cm apart. Look at right hand (4A). Turn torso gradually to the right (1 to 2 o'clock), shifting weight onto right leg. At the same time, move right hand continuously to right

past face, palm turned slowly outward, while left hand moves in a curve past abdomen up to shoulder level with palm turned slowly obliquely inward (4B & 4C).

#### **FORM 4. Therapeutic elements 1-7**

While the legs are symmetrical, weight is shifted laterally. The arms are asymmetrical, the trunk and head rotate with arm movement. Both knees are flexed and weight shifts to the leg on the side to which the arms are moving.

#### **FORM 5. Directions**

Turn torso slightly to the right, moving right hand down in a curve past abdomen and then upward to shoulder level, palm up and arm slightly bent. Turn left palm up and place toes of left foot on floor. Eyes first look to the right as body turns in that direction, and then to look at left hand (5A & 5B).

#### **FORM 5. Therapeutic elements 1-7**

Again a smaller base of support with the majority of weight on one extremity. The arm on the weight bearing side is curved back into shoulder extension. Done on the right leg and then reversed and done on the left leg. Again trunk rotates at the end of the movement.

#### **FORM 6. Directions**

Hold torso erect and keep chest relaxed. Move arms in a curve without stretching them when you separate hands. Use waist as the axis in body turns. The movements in taking a bow stance and separating hands must be smooth and synchronized in tempo. Place front foot slowly in position, heel coming down first. The knee of front leg should not go beyond toes while rear leg should be straightened, forming a 45° with ground. There should be a transverse distance of 10 to 30cm between heels. Face 9 o'clock in final position.

#### **FORM 6. Therapeutic elements 1-7**

Hand assumes a position of holding a ball initially. Movements in the form are diagonals and rotations of the trunk and head. Movements slide back and forth in and out of 6A and 6B, then position is reversed for right and left.

#### **FORM 7. Directions**

Turn torso to the right (11 o'clock) as right hand circles up to ear level with arm slightly bent and palm facing obliquely upward, while left hand moves to the front of the right part of chest, palm facing obliquely downward. Look at right hand (7A).

Turn torso to the left (9 o'clock) as left foot takes a step in that direction for a left bow stance. At the same time, right hand draws leftward past right ear and, following body turn, pushes forward at nose level with palm facing forward, while left hand circles around left knee to stop beside left hip, palm down. Look at fingers of right hand (7B & 7C).

#### **FORM 7. Therapeutic elements 1-7**

This form begins in the position of 7A, but with both feet flat on the floor. They remain on the floor throughout the exercise. Move in and out of the position 7A, B, C, A, B, C, then reverse right-left positions.

**FORM 8. Directions**

Continue to move hands in a downward-inward-upward curve until wrists come in front of chest, with right hand in front and both palms turned inward. At the same time, draw right foot to the side of left foot, toes on floor. Look forward to the right (8A).

Separate hands, turning torso slightly to 8 o'clock and extending both arms sideways at shoulder level with elbows slightly bent and palms turned outward. At the same time, raise right knee and thrust foot gradually towards 10 o'clock. Look at right hand (8B & 8C).

**FORM 8. Therapeutic elements 1-7**

With the elderly, the kick is only a small part of their available range. The form is utilized for kicking with both dorsiflexion and plantar flexion of the foot. Forms 8 and 9 are the most stressful for maintaining balance due to the small base of support and the extreme movement of the kicking leg. However, forms are done continuously with slow movements and a strong degree of concentration. The range for the kick is not extreme in the elderly.

**FORM 9. Directions**

Shift weight onto right leg and draw left foot to the side of right foot, toes on floor. At the same time, move both hands in a downward-inward-upward curve until wrists cross in front of chest, with left hand in front and both palms facing inward. Look forward to the left (9A & 9B).

Separate hands, extending both arms sideways at shoulder level, elbows slightly bent and palms facing outward. Meanwhile, raise left knee and thrust foot gradually towards 4 o'clock. Look at left hand (9C & 9D).

**FORM 9. Therapeutic elements 1-7**

The same as Form 8 but right and left are reversed.

**FORM 10. Directions**

Turn palms forward and downward while lowering both hands gradually to the side of hips. Look straight ahead (10A, 10B & 10C).

**FORM 10. Therapeutic elements**

This is a warm-down form like Form 1 and constitutes both a physical and mental ending of the exercise.