

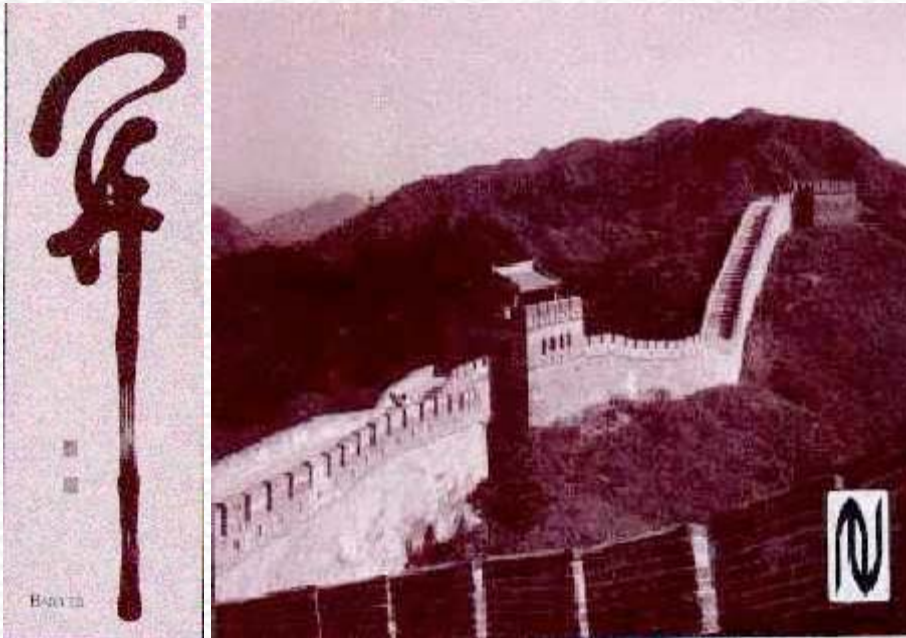


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Journal of Asian Martial Arts



Volume 2 - Number 2 - 1993

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INCREASED LUNG CAPACITY THROUGH QIGONG BREATHING TECHNIQUES OF CHUNG MOO DOE

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Introduction

There are many reports of the healthful benefits of martial art training (Zhao, 1984; Maliszewski 1992). Usually these reports consist of martial art experts, as well as students, attesting to the value of their training programs. These benefits can include improved physical fitness, resolution of specific body problems and a subjective feeling of mental improvement. However, objective evidence on the effectiveness of martial art training for improving the health of the average student is lacking.

Martial art training involves the performance of specific movements over a period of time until a certain proficiency is achieved. One important aspect of many advanced martial art training programs involves the development of some form of breathing control. Specific breathing forms (*qigong*) have been alleged to improve the circulation and strengthen both the immune system and the internal organs. Other *qigong* breathing forms stretch the muscles, clear the mind and reduce stress (Eisenberg, 1985; Wilhelm, 1985). *Qigong* means the practice of developing *qi*. *Qi* has been described as the energy of the body. It is associated with breathing as well as muscle and mental activity. It is more of a life energy than a measurable substance (Ming-Dao, 1990). *Qigong* breathing techniques are taught in the Chung Moo style of martial art. Chung (mind) Moo (body) martial art (also known as Um Yang martial arts) has its foundation in Chinese martial arts. It was first introduced into the United States twenty years ago.

Our own positive experiences practicing *qigong* breathing (a cumulative experience of twenty- nine years in the Chung Moo style of martial art) led us to interview many other students who also practice *qigong* breathing forms. They stated that they felt "energized" after practicing *qigong* breathing and they were able to complete daily activities more easily. Many stated that they had fewer colds, more energy and greater endurance. Some of these students originally had been severe, activity-restricted asthmatics. After practicing *qigong* breathing, they became very active and also noticed a marked decrease in the use of their asthma medications (Massey and Thorner, 1992). We wanted to determine if there was a measurable, physiologic parameter that could justify the apparent feeling of improved health in those practicing *qigong* breathing. Since the students were practicing a specific breathing form, the most obvious parameter to measure was the amount of air each student could exhale with a single breath. We postulated that, through *qigong* breathing techniques, there may be a significant increase in the lung capacity. We compared the functional lung capacity in those students who practiced *qigong* breathing with the lung capacities of an age- and height-matched control population (national average). Our data confirmed that students who practiced *qigong* breathing had a marked increase in their lung capacity.

METHODS

One hundred students training in the Chung Moo style of martial art volunteered to participate in this study. Students were randomly selected and represent an age span of between twenty and seventy-one years of age. All had been practicing *qigong* breathing forms for at least four months.

The lung capacity of each student was measured using an Assess Peak Flow Spirometer. Students, after taking a deep breath, would expel as much air as possible, as fast as possible into the spirometer. The flow of air (liter/min.) was measured by the spirometer. Spirometry was performed four consecutive times per student. All students were evaluated before practicing *qigong* breathing forms. The numeric value for each student was determined as the average of the four attempts. The numeric value of each age group was an average of all of the students in that age group.

The numeric value of lung capacity was calculated by using the national standards for lung capacity and peak air flow volumes. Since lung capacity is directly related to both age and height, student's lung capacities were compared with national averages for both their age and height (Leiner et al., 1963).

RESULTS

A Sample Qigong Breathing Technique

Photos courtesy of E. Thorner

Figure I-1

Air is drawn into the lungs through the nose as the arms and leg move to one side in unison.



Figure I-2

Intake of air is completed as the arms reach the level of the shoulders. The air is then pushed into the abdomen, ready for expulsion.



Figure I-3

Air is released in a controlled manner as the arms move downward.



Figure I-4

The movement is completed with total release of the air, an extension of the arms toward the toes and a pulling in of the stomach. *The entire sequence can then be repeated.



Figure I: *Qigong* breathing practiced by students in the Chung Moo style of martial art. One of many different *qigong* breathing forms is demonstrated. Air is taken in through the nose (Figs. I-1 and 2), forced down into the abdominal area (Figs. I-3) and finally expelled through the mouth while contracting the abdomen (Figs. I-3 and 4). These and other similar breathing movements are practiced for twenty minutes per day, three to four times a week. Movements are done in a relaxed manner and are continuous. *Qigong* breathing movements are done an equal number of times on the right and left side.

**INCREASED PEAK FLOW RATE
IN STUDENTS PRACTICING QIGONG BREATHING
IN THE CHUNG MOO-STYLE OF MARTIAL ART**

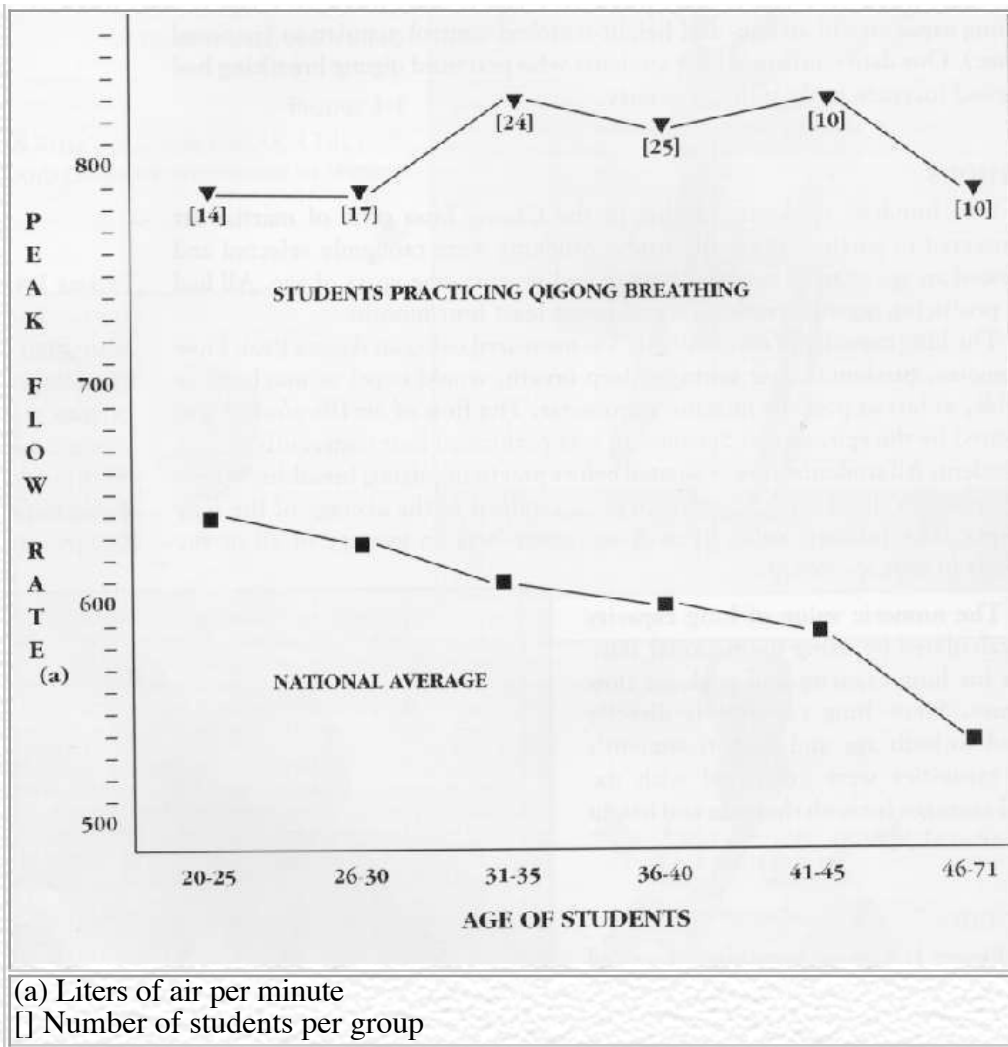


Figure II: Increased peak flow rate in students practicing *qigong* breathing in the Chung Moo Style of martial art. The peak flow for each age group represents the maximum speed at which air was expelled from the lungs after a single deep breath. Each value is the average of four measurements for each student in the specific age group. These values were compared to the national average for each age group. The national average peak air flow declines with increasing age. In comparison, there was no decline in the peak air flow for those students between the ages of twenty and seventy-one who practiced *qigong* breathing.

**PERCENT INCREASE IN LUNG CAPACITY
 OF STUDENTS PRACTICING QIGONG BREATHING
 IN THE CHUNG MOO-STYLE OF MARTIAL ART**

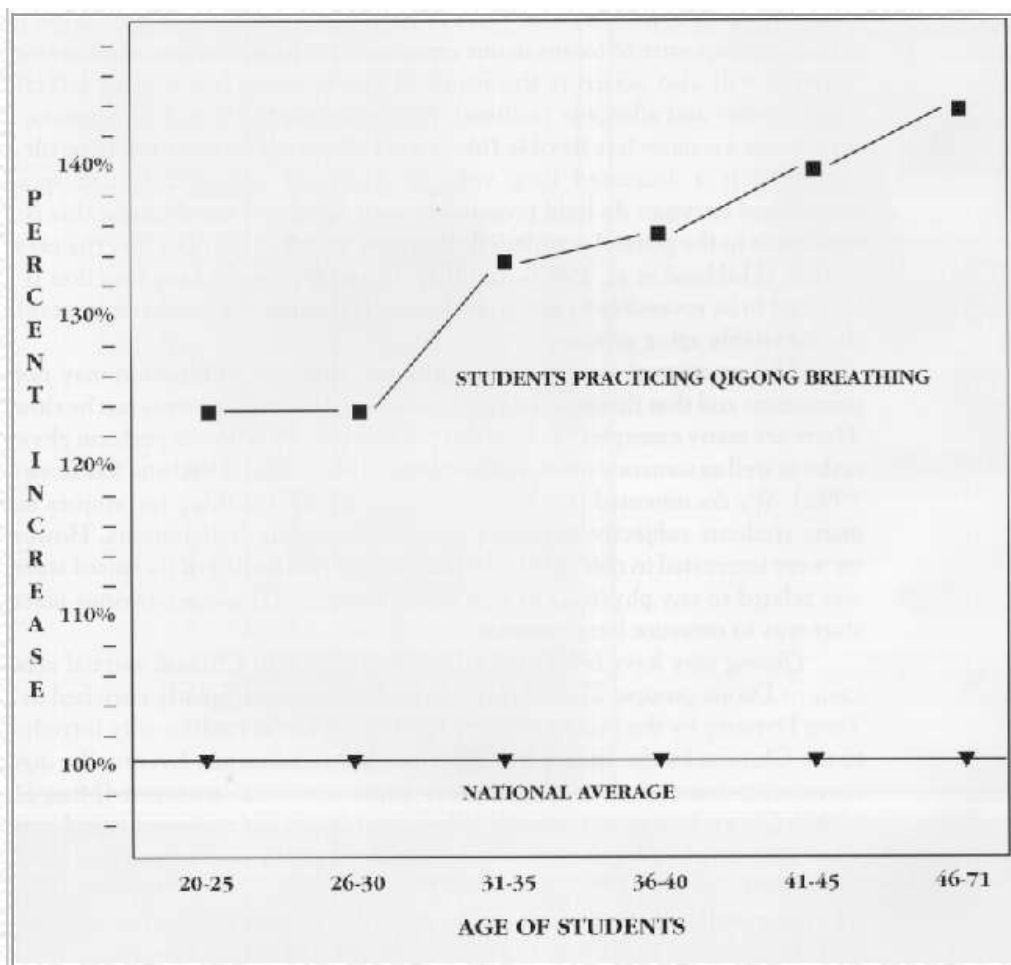
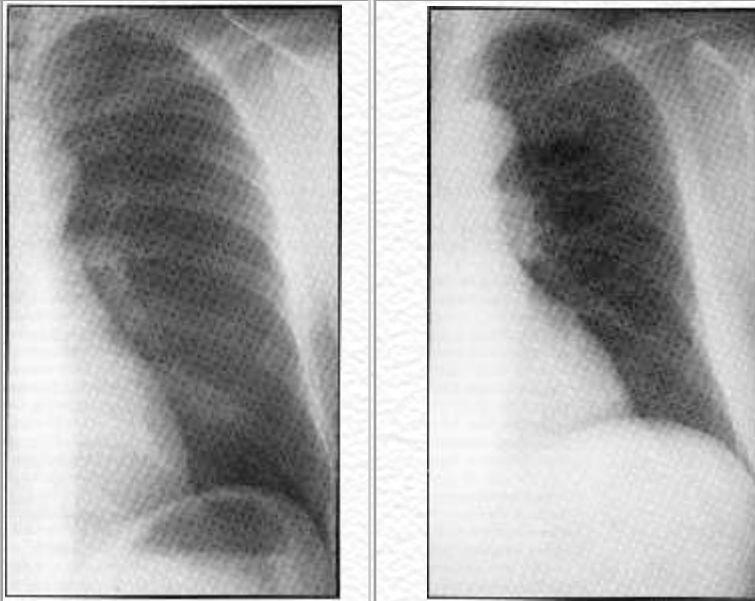


Figure III: Percent increase in the lung capacity of students practicing *qigong* breathing in the Chung Moo martial art style. These data show that the greatest percent increase in lung capacity is in the older students (between thirty-six and seventy-one years of age) who practiced *qigong* breathing. For comparison purposes, the national average lung capacity for each age group was set at 100%. As a result, in the older students, the lung capacities were 30-45% greater than age- and height-matched controls (national average). A smaller but significant increase over the national average (20-25%) was seen in the younger students.

DISCUSSION

As the human body ages, certain functions diminish. There is a decrease in hearing, eyesight, muscle mass, bone density, memory and learning. Reaction time dramatically increases. There is also a decrease in lung capacity that is believed to be irreversible (Poppy, 1992). This loss of lung capacity may reflect structural changes of the chest shape resulting from increased curvature of the spine and a loss of postural height (most commonly the result of osteoporosis). There are also changes in the lung tissue itself. The lung tissue loses some of its elasticity. This is the result of years of scarring by multiple insults to the lung tissue, e.g., exposure to toxins in our environment: pollution and tobacco smoke. Scarring will also occur as the result of the immune response to infections (pneumonia) and allergens (asthma). As the amount of scarring increases, the lung tissue becomes less flexible (like a dry balloon). The measurable result of a stiff lung is a decreased lung volume. Although antioxidants and specific aerosolized enzymes do hold promise in some specific lung diseases, this is not applicable to the general population; there are no drugs that can stay the ravages of time (Hubbard et al. 1989). In other words, the loss of lung function is not believed to be reversible to any great degree. It is simply an unfortunate

result of the inevitable aging process.



A thirty year old male.

A seventy-six year old male.

X-Rays comparing the left lung of a young adult male with that of an elderly male. The reduction of lung capacity is largely due to the effects of ageing. However, this common tendency for the lungs to progressively decrease in function can be beneficially impeded by regular practice of qigong breathing exercises.

The practice of martial arts emphasizes that loss of function may not be permanent and that through the proper training, the aging process can be slowed. There are many examples of older martial art students who can perform physical tasks as well as someone many years younger (Ming-Dao, 1990 and Maliszewski, 1992). We documented that the practice of *qigong* breathing techniques made many students subjectively more energetic, increased their stamina. However we were interested in objectively documenting if this feeling of increased stamina was related to any physical changes in the students. The most obvious place to start was to measure lung capacity.

Qigong may have been originally introduced into Chinese martial arts by various Daoist groups. These breathing techniques were greatly enriched in the Tan Dynasty by the incorporation of breathing forms traditionally introduced to the Chinese by the Indian Buddhist monk Bohidharma. Eventually, *qigong* movements found their way into many Chinese martial art forms (Ming-Dao, 1990). *Qigong* incorporates many different positions and movements and is most often associated with promotion of health through the development of internal strength (Chang, 1978). These breathing techniques are so intertwined with Chinese martial arts that now it is almost impossible to practice advanced martial art forms without being introduced to some form of *qigong* breathing.

We wanted to evaluate the effects of *qigong* breathing on the lung capacity. We needed a large group of participants who were all practicing the same set of breathing movements. In this way the individual results from each age group could be combined. We chose to evaluate students practicing the Chung Moo style of martial art. The Chung Moo style has deep roots in Chinese martial arts and specific *qigong* breathing forms are part of the training program. Chung means a "balanced mind" and Moo

means a "strong body." Chung Moo, a name used generally throughout Asia, can also represent the aspects of Yin and Yang (Chinese) or Um Yang (Korean), signifying a balance between the mind and the body.

Practice of the *qigong* breathing movements involves a controlled intake of a large volume of air into the lungs. The air is then pushed into the abdominal area and then is followed by a controlled expelling of the air (Fig. I). Our data confirmed the hypothesis that there was a measurable improvement in lung capacity related to the subjective feeling of improved stamina in those students practicing *qigong* breathing techniques. The older students apparently realized the greatest benefit. Their resultant lung capacities were much greater than their age- and height-matched controls (Fig. III). This may reflect that an older student initially has a smaller lung capacity than a younger student. Between the age of twenty and seventy-one, in the general population, there is a loss of at least 30-35% of the lung capacity, the equivalent of having one-third of the total lung mass surgically removed (West, 1977). However, this "lost" capacity is apparently not lost forever. After they practiced *qigong* breathing techniques, the lung capacity of the older and younger students were not statistically different (Fig. II). Interestingly, even the younger students demonstrated a significant increase in lung capacity. This indicates that there is considerable room for improvement even in the younger student.

Unlike a machine, in the human body, specific organs, joints and tissues become more efficient, more flexible or more supple with increased use (in the right manner). *Qigong* breathing promotes a remarkable increase in the lung capacity. Whether the increase in lung capacity reflects an increase in the chest wall size or an increase in flexibility of the lung tissue itself can not be determined from this study. One intriguing possibility is that *qigong* breathing may train the student to tap into this large lung volume (West, 1977). A whale, however, can exchange greater than 90% of its total lung volume. *Qigong* breathing may train the student to tap into this large lung volume reserve with every breath, to become more efficient in breathing. Again, this study cannot answer this hypothesis.

As with all scientific studies, more questions are raised than answered. Would breathing forms in other martial art styles compare favorably with those taught in the Chung Moo style martial art? How fast do *qigong* breathing techniques increase lung volume? Could *qigong* breathing movements reverse the severe lung damage from emphysema and cystic fibrosis? How long do the benefits last after stopping *qigong* breathing? What other organ systems does *qigong* breathing affect? Preliminary blood pressure studies on students practicing *qigong* breathing indicate that circulation is also favorably influenced (data not published). It is clear that martial art training and the study of medicine both seek answers to the same questions to understand how the human body works. The combination of martial arts and medicine is exciting in that new insights into how the human body works may be found.

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