

Special Report 2

Cultivation of Physician- Scientists

Experimental Techniques
Training Courses at
Hualien Tzu Chi Hospital
& Tzu Chi University

Written by Chien-Min Shen and Ching-Fang Tseng



To the general public, physicians should behave kindly, demonstrate sophisticated skills and relieve the sufferings of their patients. However, besides their clinical duties, doctors at medical centers are also responsible for teaching and research.

Hualien Tzu Chi Hospital is the only medical center in Eastern Taiwan. It assumes the role as an outpost in the mountainous Eastern Rift Valley. The hospital also diagnoses rare diseases in remote areas. Since its inception in 1986, through teamwork, the medical center has saved countless and seemingly hopeless lives. The experience and wisdom accumulated over a quarter of a century

are invaluable; it should be preserved and passed down to younger physicians.

However, the educational process of medical students emphasizes the teaching of medical theories and training of clinical skills. For a licensed medical doctor, returning to the laboratories and working with test tubes and microscopes seems to be a vague, remote experience. For this group of physicians, continuing education in a research institute is attractive but difficult to begin.

The planning of a medical research dept. in Tzn Chi Hospital began in 1990. The dept. became operational in 1992, with its first director Professor Hsing-I Chen, a physiology specialist. Today, the



Cardiologist Yu-Chih Chen was practicing the experimental procedure.

Dept. is headed by pediatric cardiologist, Dr. Ching-Feng Cheng.

In 2011, Dr. Cheng, together with Vice Director Dr. Cheng-Yoong Pang and associated researcher Mei-Jen Wang, started the training courses for physician-scientist. The courses include an introduction to experiment principles, procedures and skills, as well as hand-on operations. These fundamental training courses are planned for medical doctors to refresh their basic lab skills in order for them to enter medical research fields or to pursue advanced studies.

Pass on the Knowledge

More than ten years ago, Director Ching-Feng Cheng conducted medical research in the United States, sponsored by grants from the National Institute of Health. When he finished his studies and returned to Taiwan, he was determined to share his valuable knowledge with younger physicians.

In August, 1999, through the encouragement of the then Honorable Superintendent of Tzu Chi Hospital, Ing-Ho Chen, and Dr. Ching-Feng Cheng applied for the “Physician Research Grant” sponsored by the National Institute of Health. It was a program for full time clinical attending physicians recommended by medical centers and/or medical educational hospitals from

all areas in Taiwan. It was a five year program, with the first two years involving study full-time abroad in a basic medical research laboratory. During the remaining three years, the researcher returns to his or her original position in Taiwan to pursue further medical research. Dr. Cheng was one of five physicians selected in 1999, and was the only physician chosen from a private hospital. He spent his first two years studying at UC San Diego, concentrating in research of cardiac developmental biology. He returned to Hualien Tzu Chi Hospital in 2001.

Dr. Cheng never received any formal research lab training before his study abroad. Because these types of trainings are pre-requisites for a lab researcher, Dr. Cheng spent almost his entire first year on practicing cell tissue slicing and interpreting results of this process. This learning process had driven his determination to share such a valuable experience with his cohorts. However, his wish was delayed because of his engagement in the establishment of Taipei Tzu Chi Hospital.

In 2010, business in the pediatric department in the Taipei Tzu Chi Hospital stabilized. As he wished, Dr. Ching-Feng Cheng finally returned to Hualien and assumed the position as the director of the Research Dept. To spare their time from their already busy schedule for medical research is a difficult task. In order to



During the first half of the class, student doctors (interns) listen to Dr. Sheng-Chun Chiu's (right) lecture pertaining to an experiment.

promote a research-oriented atmosphere, Dr. Cheng thought of many different approaches to overcome restrictions.

A Teaching Plan That Resembles Cooking Demonstration

Since 2010, there were several research assistants with post-doctorate qualifications joined the college. In addition, there were residency doctors of the cardiology department, Dr. Chiu-Fen Yang and Dr. Mei-Ling Chen, both graduates of Tzu Chi University. They all told senior attending physician, Dr. Yu-Chih Chen, that they were willing to

squeeze advanced medical research into their busy schedules. Coincidentally, Dr. Chiu-Fen Yang had taken Dr. Cheng's class at Tzu Chi University, so she was familiar with and convinced by Cheng's idea of "doctors need research".

In 2011, Cheng realized that he had sufficient support and his timing was right. He then assembled a group of specialists from various fields led by associate researcher Mei-Jen Wang to arrange courses. The lecturers at that time included research assistants: Doctors Li-Yi Sun, Sheng-Chun Chiu, Chin-Hua Yeh, and Hsin-Yin Huang. The classes were arranged in a way that all young student

doctors could gain hands-on experience in the laboratory.

“Hands-on practice” is the most important principle of the training courses. Except for the lectures at the beginning of a class, more than two-thirds of the time is spent on demonstration and hands-on experiments. This is the best way to reinforce one’s memory.

At the request of Dr. Cheng, the lecturers arrange the class similar to the setting of the live broadcasting of the TV cooking demonstration program. In such procedure, a dish that requires three hours of preparation time is condensed into approximately half an hour. This requires that the lecturer prepare two to three sets of “semi-manufactured products”. The students then listen to the instruction for the preparation procedures and then follow with the finishing steps of the experiment.

In view of the time consuming preparation process of the lecturers and the scheduling constraints of the students, the class size is limited to 10 students. The overall length of the course is nine months. Lecturers begin with the simple principles and move progressively into in depth subjects continuously. They cover: biology, microbiology and immunology, molecular biology, biochemistry and physiology. Each class is delivered by a lecturer with a test lab assistant. A trial run will be conducted for every class, to

ensure that the content is correct and the quantity is accurate.

Wide Range and Number of Applicants

Before the class began in September of 2011, the Research dept. made two announcements through its internal mailing system. At that time, the dept. was concerned of the lack of interest in the hospital, except for the two residency doctors from the Cardiology Department. Surprisingly, 15 applications were received. Applicants included: orthopedics, general surgeons, pediatrics, rehabilitation physicians, pathologists and emergency physicians.



Doctor students volunteered to give blood when a blood sample was needed for the experiment. Dr. Mei-Ling Chen carried out the responsibility of drawing blood.



“Pass down the knowledge” is the key spirit of a physician-scientist.

In reviewing the background and expertise of the applicants, Dr. Cheng carefully arranged the classes to satisfy all the needs of the “students”. In fact, the applicants were not just younger but very senior doctors.

The first class formally started on October 8, 2011. Dr. Li-Yi Sun was the lecturer, discussing cell culture. This class was scheduled for every other Saturday morning so that all students had the time and opportunity to perform the experiments. The full course was completed by the end of June in 2012. Dr. Sun indicated that this was the first time such a course was offered, and because

he is the first lecturer, there is no routine to follow. Dr. Sun inspected all the test apparatus before his class and ensured that they were in perfect operating condition.

Course planning coordinator and associate researcher, Mei-Jen Wang, feels that “Medical research is to search of the key questions between discovering the sign of the symptom and the actual treatment. As you figure out a way or come up with ideas, you must do things yourself to reach the right judgment. But research planning cannot be taught. The training classes teach you a more reasonable way to structure your research

plan.” She hopes that the students participating in the classes will become protégés when returning to their hospital positions to promote medical research.

“Director, are you sure you want to be the first one? My skill may not be good enough. I may not get any blood on the first try...” During one of the classes, three blood samples were needed for the demonstration and operation of the centrifuge machine. Director Huang of ICU was the first to volunteer, Dr. Chou and Pathologist Dr. Ming-Hsing Lee followed by immediately rolling up their sleeves. The important task of drawing blood fell on the hands of the youngest residency doctor, Mei-Ling Chen.

The young Dr. Chen drew six blood samples from the three “seniors”. She finished with a big relief, “I was so nervous! Thanks to our teacher and seniors to give me this opportunity to practice.” This reflected the tradition of passing down the spirit with true heart that is ubiquitous in the Tzu Chi missions. Seniors rolled up their sleeves, and was willing to be the guinea pigs for the younger generation. “Lecture by action; teach by demonstration” – the silent teaching set perfect examples for the young doctors.

One of the lecturers, Dr. Sheng-Chun Chiu, has received much positive responses from the students since the beginning of the class. He expressed that doing experiments using his own

hands is the most interesting part of the course. Because all the students come to the class voluntarily, they demonstrate positivity, initiative and seriousness. If they had to be absent from the class, they always apologetically asked that their absence be excused. During the career of a medical doctor, one may not have to conduct experiments by oneself. Most of the time, tests are performed in the lab by the assistants. However, test apparatuses are becoming simpler, more humanized. Moreover, it is more difficult to detect wrong steps in the tests and incorrect test data. The real purpose of the physician-scientist program is, therefore, to understand the theory behind the tests, to interpret the experimental data, and to find solutions of the problem.

One brave student, a pathologist Dr. Ming-Hsing Lee, indicates that the most significant achievement coming out of the class is to understand the test procedures not explicitly written in professional journal articles. In addition, it also becomes easier to visualize the meaning behind the numbers and charts, which are very important in his future research.

Rehabilitation physician Dr. Cheng Hung Yu is currently working toward his PhD degree. He indicated that at graduate school, the experimental classes only teach the basic theories behind the tests. The actual tests are usually conducted by assistants, and the students only have

to review the data. The only chance for a student to understand all aspects of a test is when one actually practically conducts an experiment. Not only that, with hand-on experiments one establishes the ability to properly interpret the test data and to judge the validity of the results. Dr. Cheng says: “You can actually feel the bitter-sweet part of each chart in a paper only when you have the experience of collecting the data with your own hands.”

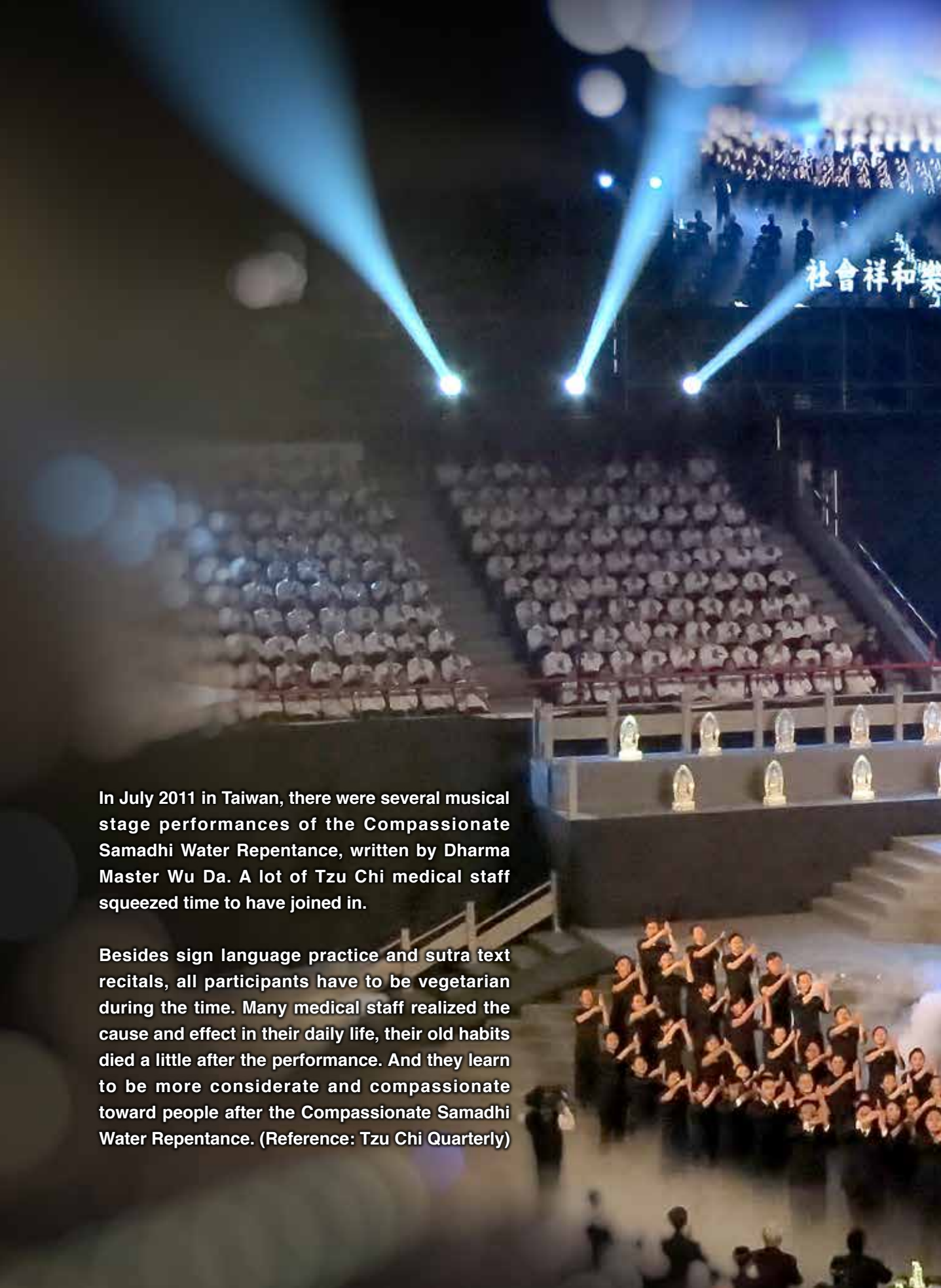
With the success achieved by the first echelon, a second echelon of physician-scientist class is ready to begin in February 2012. In the future, the research Dept. is also considering working with orthopedics and surgery departments to conduct

research in public health that is closely related to the geographical characteristics, population structure and socioeconomic pattern of eastern Taiwan. In particular, in depth studies will be carried out in the areas of biostatistics and epidemiology.

The physician-scientist is only the beginning of a long-term research project. The long-term goal is to promote medical research that will result in technology break-through. Dr. Ching-Feng Cheng wishes that all doctors of Tzu Chi Medical Foundation not only simply offer the best medical services to their patients, but also regain their enthusiasm of medical science to explore the truth of medical care.



Group photo of Hualien Tzu Chi Medical Center Physician-Scientists classes Term One, including Superintendent Ruey-Ho Kao, Vice Superintendent Hung-Wen Liu, Director of Research Dept. Ching-Feng Cheng, and lectures, members.



In July 2011 in Taiwan, there were several musical stage performances of the Compassionate Samadhi Water Repentance, written by Dharma Master Wu Da. A lot of Tzu Chi medical staff squeezed time to have joined in.

Besides sign language practice and sutra text recitals, all participants have to be vegetarian during the time. Many medical staff realized the cause and effect in their daily life, their old habits died a little after the performance. And they learn to be more considerate and compassionate toward people after the Compassionate Samadhi Water Repentance. (Reference: Tzu Chi Quarterly)

*Dharma Water Cleanses
Mind & Soul
Medical Staff Carry
in Heart to Serve*

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