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Saving Lives, Safeguarding Health, and Upholding the Spirit of Love.



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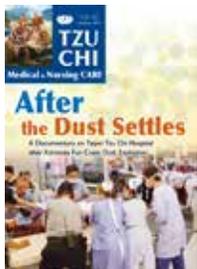
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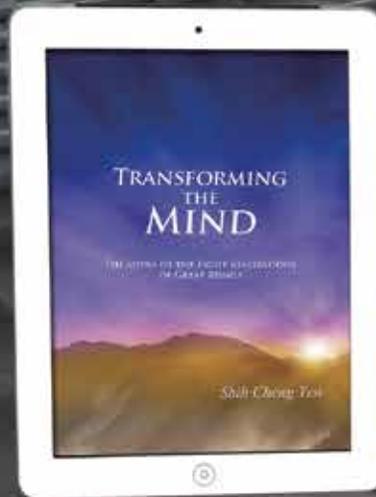
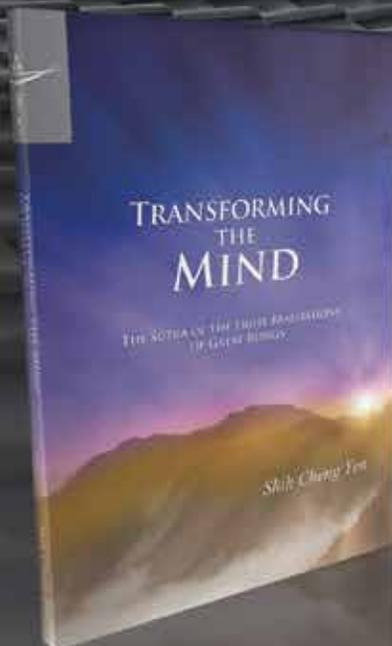
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TRANSFORMING THE MIND

THE SUTRA OF THE EIGHT REALIZATIONS OF GREAT BEINGS

The Sutra of the Eight Realizations of Great Beings contains the fundamental practices allowing us to make the most of our potential as human beings. In her explanation of the text, Dharma Master Cheng Yen uses stories from the Buddha's time and our days to relate these teachings to modern life. In this way, she lays out a path for how to grow in compassion and wisdom by going among people to help those in suffering.



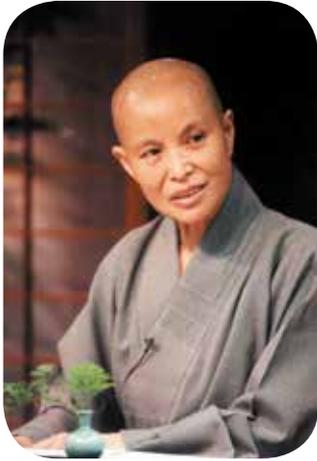
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The Sunshine Smile

Ever since the waterpark dust explosion in June, 2015, I have been concerned with the young survivors whom had to go through such a horrible ordeal. Although many of them were successfully discharged under the good care of the medical professional, I cannot but to worry whether they are ready for the long and arduous rehabilitation ahead. During my travel in September, I met with several survivors. They were more optimistic than I anticipated. Their smile unburdened my worries.

However, the burned scars under the pressure garment aches, itches, and bleeds and tears when dressing. I asked one of the boy, “I see you twisting and turning, is it because of the pain?” “It hurts and itches like worms crawling under my skin, and the twists and turns relieve the discomfort,” He replied with a smile. “Are you relieved inside?” I asked. “I am grateful,” he responded. He was grateful for all the sincere care and aids when he was hospitalized. I reached out



to feel the pressure garment, the texture was hard to the touch. I can only imagine how hard it must be to wear the garment for a year or two.

A women, as I recall, was doused with gasoline by her husband four years ago, resulted in serious burn on her upper torso. She was immediately sent to Hualien Tzu Chi Hospital, where she cooperated keenly to therapy and rehabilitation. She spent a year inside the pressure garment, enduring the itching discomfort, and was only allowed to remove it when showering. Fortunately, she recovered so well that one cannot tell she was a burn victim. Those burn scars are only visible to the touch. I used her as an example, encouraging the young survivors to endure the suffering, leave the trauma behind, and embrace the sunlight. I also urge Da ai Technology to speed up their research on the new fabric that would significantly improve the comfort and ventilation of the pressure garment.

When the tragic accident occurred, Taipei Tzu Chi Hospital mobilized immediately to receive incoming patients, stood in the frontline to save lives. These medical staff could not have done it without the support from their family. Even the child of a nurse said sensibly, “Burn is painful. They need my mom, so mom has to work.” Our community volunteers continued the care after these patients were discharged, keeping them company at all time.

One should give without expecting anything in return. Watching the survivors recover to health is the best reward for our medical staff and volunteers!

Treat Fire with Love



Chao You-Chen, M.D., Superintendent of Taipei Tzu Chi Hospital

On the eve of June 27, 2015, the ravaging fire from the dust explosion at the Formosa Fun Coast injured many young partygoers, sending panic and confusion across the waterpark. The injury toll continued to mount with each breaking news. Although we were informed by the relevant authority that there were many hospitals nearby the incident site, which should be able to accommodate all injured patients, my intuition told me otherwise. I wanted our staff at Taipei Tzu Chi Hospital to be prepared should any situation arise. The emergency mobilization was issued at 10pm, 126 hospital staff returned to the hospital from the dormitory or their residences, medical volunteers awoken from their slumber to standby at ER. It was not before long when ambulances began cruising in, transporting 13 young patients with severe burn.

The situation was critical. The surface of 2nd and 3rd degree burn on these patients averaged around 60%, or 90%

in the most severe case. Our medical staff crowded at the patients' bedside, busy intubating, infusing, cleaning wounds, and contacting family members. Once conditions stabilized, these patients were immediately transferred to ICU. Firefighters soaking in their sweat, volunteers consoling the young, pain-stricken patients, cleaning staff delivering oxygen tanks and dressing carts, nurses divided into two teams treating patients transferred to ICU at 3rd and 6th floor. By the time the final patient was treated, it was long past midnight.

June 28 was a Sunday. A letter of condolence from Master Cheng Yen and emergency relief money were delivered by the Religious Department of the Foundation. I hand it over in person to the anxious family members, tears were clearly visible in their eyes. The plastic surgeons estimated, according to past medical literature, the mortality rate for our patients with large body surface burn would

exceed 50%. To build a stronger support for our medical team, I acquired the assistance of the Burn Center in Hualien Tzu Chi Hospital, and Nurse Chen Wen-Chun and Wang To-Jung, experienced in burn care, arrived in Taipei by an overnight train. Plastic Surgeon Chuang Chun-Chi, Nurse Chen Huai-Yu, Yu Wan-Ju, and Lai Hsiao-Fan from Hualien Tzu Chi Hospital; Plastic Surgeon Hsu Honda, Nurse Anesthetist Lin Hui-Mei, Huang She-Fen, and Su Shih-Yun from Dalin Tzu Chi Hospital; Supt. Chien Sou-Hsin, Plastic Surgeon Yang Chou-Chih, Chang Pi-Shan, and Nurse Chang Hua-Ju from

Taichung Tzu Chi Hospital; and Dir. Peng Tai-Chu, Asst. Prof. Hsieh Mei-Lin, and Ass. Prof. Yi-Maun Subeq from Dept. of Nursing, Tzu Chi University all came to assist.

After the dust explosion incident, 14 patients were admitted to Taipei Tzu Chi Hospital, and 12 of them stayed for treatment. To ensure that all our patients receive quality care and to eliminate risk of infection, we isolated a positive pressure ventilation burn section inside ICU to centralized all the burn patients, regulate in and out traffic, setting up video calls to replace face-to-face visit, and



During the care period, Chao You-Chen, Superintendent of Taipei Tzu Chi Hospital had been visited the burn patients at the ICU every early morning.

hold daily interdisciplinary meeting every 8am and 12:30pm, discussing in detail the conditions of each patient. After a two month long treatment, most of our patients were successfully transferred out of ICU or discharged, except for Huang, who suffered a 95% body surface burn, succumbed to her injury. A group of heroes and heroines that occupied a majority of the staff devoted to the rescue deserves a proper recognition. This group is known as nurses.

Every patient required wound dressing at least twice a day, last an hour or two each time, with the assistance

of at least 6 to 8 nurses working in collaboration. From preparing medicine, undressing, unpacking, clean, dressing, apply crepe bandage, apply gauze, change bed sheets, to cleaning the patient's body, every single procedure is critical. In response to the high demand of dressing staff, nurses who were experienced in intensive care or burn care teamed up into what was called a "dressing team", with seven nurses a team, two teams in rotation (day shift and night shift). Before each dressing session, the team would hold a meeting, discussing the dressing methods and



On August 26, 2015, Taipei Tzu Chi Hospital hosted a farewell party for two burn victims, everyone was happy for them.

wound conditions of each individual patient. With each surgery, wound debridement, grafting, and dressing methods change accordingly. With the end of each shift, team members would again gather together to discuss wound conditions and dress techniques. To shorten dressing time and minimizing patient pain, the nursing team developed their own dressing manual, documenting in detail the conditions, burned areas, and dressing procedures of individual patient. It is a perfect example of the mindfulness and patience of our nurses.

What the patients and their families looked forward to each day was the video chat twice a day after wound dressing. Some patients had trouble speaking, our nurses would accompany them and report to the family members on the other side of the screen how the patient was doing. As the burn patients have elevated metabolism rate, adequate nutrition is vital to accelerate wound healing and to build immunity. Most patients had burns to the extremity, and the thick gauzes wrapped around the limbs limited their mobility. The nurses had to feed them spoon by spoon with occasional words of encouragement.

Wound dressing already demanded a great deal of nursing staff. Starting week two, the burn patients would require intensive debridement and grafting, the additional tasks further strained the nurses

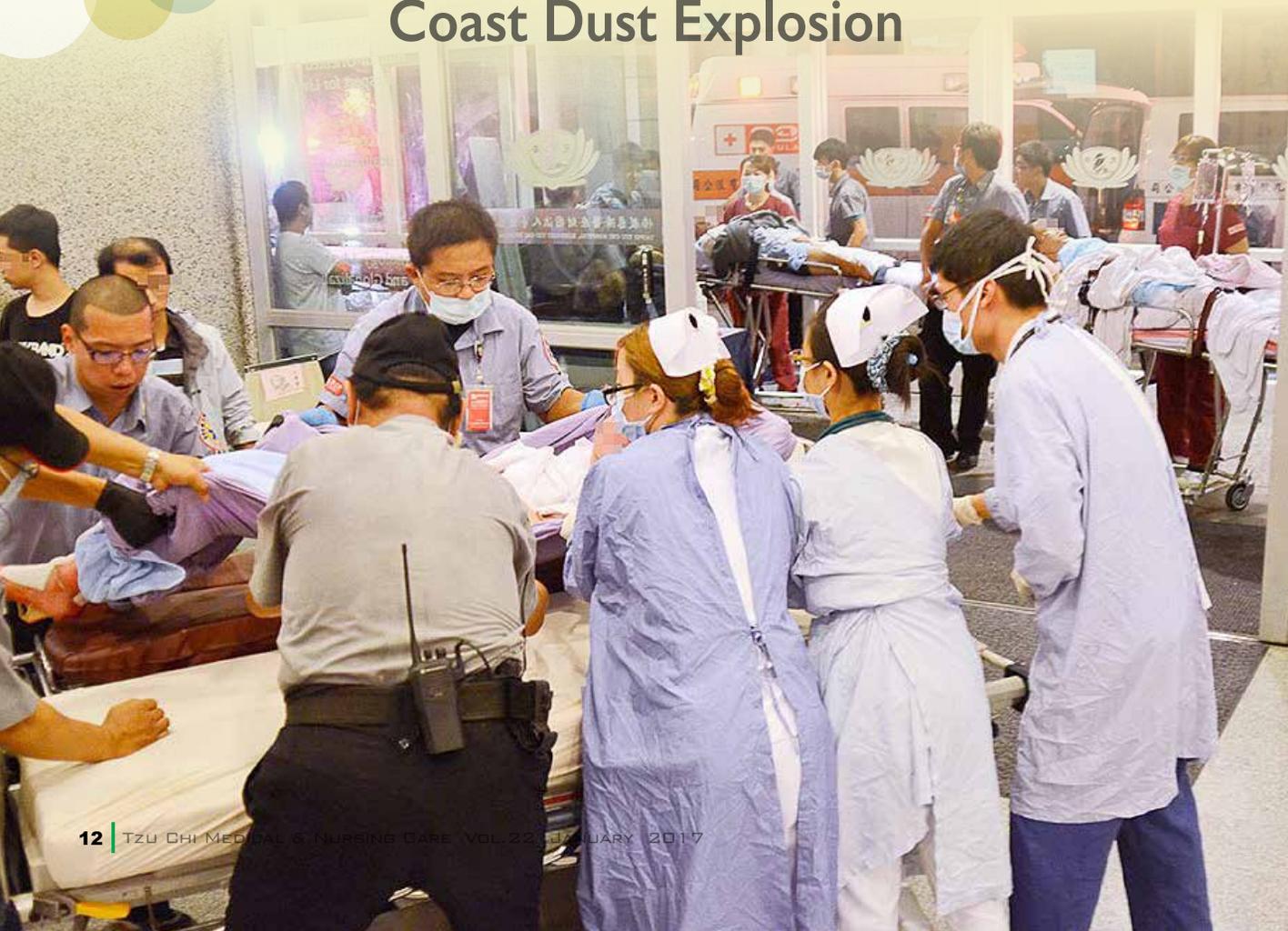
in the operating room. In response, nurses from all departments came to assist, either during off-hours, cutting short vacation time, or postponing resignation.

Many young nurses in Taipei Tzu Chi Hospital care were thrown into the fray without any experience. They faced burn patients for the first time, and the inexperience translated to stress and fear of inability to care for these critical patients. As they watched the large surface burn on these patients, listened to their cry and plea when dressing, and the empathy from age similarity, many of the young nurses burst into tears on several occasions. Thanks to the guidance, comfort, and encouragement from senior nurses, together with the assistance of psychologists, these young nurses gradually adapted to the stress. The frequent “thanks” from the patients and their families also revitalized our medical staff.

Under the attentive care and treatment of the medical team and volunteers, the conditions of these burn patients finally stabilized, and many were discharged. No matter where they live, in Taipei, Yilan, Hsinchu, or Yunlin, the community volunteers are there to assist with the follow-up care. I would like to thank all our Hospital staff for their selfless dedication. We shall continue on the path of saving lives together and side by side.

After the Dust Settles

A Documentary on Taipei Tzu
Chi Hospital after Formosa Fun
Coast Dust Explosion





**On June 27, 2015, 8:40pm,
The worst burn accident in the history of Taiwan
took place at Formosa Fun Coast,
where the dust explosion injured 508 people.
Taipei Tzu Chi Hospital immediately
initiated mass casualty incident protocol,
mobilizing over 120 medical staff into rescue,
as 13 patients with burns ranging
from 40% to 90% body surface area arrived.**

**Medical and administrative staff collaborate seamlessly,
holding two interdisciplinary team meetings a day,
to update all changes on the patients' conditions,
and to determine joint treatment plans.**

**Under the comprehensive care of
Tzu Chi medical team and volunteers,
two months went by,
and the patients were successfully discharged
one after another.**

**The road to rehabilitation is long,
and the love and care from the medical team
and volunteers will never cease...**

/ Hsu Li-Hui

Around 9pm, June 27, all the news media ran the Formosa Fun Coast dust explosion on the newsflash. As the firefighters and paramedics rushed to the scene, hundreds of injured teenagers were wailing in pain. A party of fun and game turned into an inferno in a matter of only seconds.

Initiating Mass Casualty Incident Protocol

When Supt. Chao You-Chen received the news, he contacted the New Taipei City Fire Department at 9:30pm, notifying them that the Taipei Tzu Chi Hospital was ready to the patients. At 10:30pm, the

New Taipei City Department of Health contacted the hospital that approximately twenty patients with 15% to 20% body surface area burned would arrive shortly. 10:47pm, the first burn patient, transported by the patient's parents, arrived at the emergency room. After a brief assessment, the medical staff at the scene realized the severity of the burn was seriously understated: the total body surface area burn on this patient was at least 60%.

In preparation of the arriving burn patients, Yiang Giou-Teng, the director of ER, initiated the mass casualty incident protocol and corresponding ward bed arrangement. In addition to

The medical staff treating the patient.



Supt. Chao, Vice Supt. Shyu Rong-Yuan, Vice Supt. Chang Heng-Chia, and Chief Secretary Chiao Li-Hua, over 120 medical professional, medical technologists, and administrative staff immediately returned to their post awaiting further instruction.

From 11:06pm to 12:33am, 12 patients transported by ambulance arrived at the hospital in succession. They were all very young, aging from 17 to 27, with 24% to 90% body surface area burn of 2nd and 3rd degree. Dir. Lu Chun-De, Dr. Wang Shu-Wei, and Dr. Lin Chung-Chiao from the plastic surgery, as well as doctors from ER, lead in stabilizing the patients' conditions, while Night-shift Head Nurse Tsai Pi-Chueh coordinated the nurses to



Taipei Tzu Chi Hospital Supt. Chao You-Chen(middle) and ER Dir. Yiang Giou-Teng(left), Vice Supt. Chang Heng-Jia(right) discussing patient treatment plan.

treat the wounds. “These patients were burnt all over. Aside from attending to



Taipei Tzu Chi Hospital initiated mass casualty incident protocol, all medical staff returned to their post.



Tzu Chi volunteers came to resupply medicines.

the patient's conditions, we needed four nurses cleaning the wound, draw blood, performing infusion, and administering IV drip, antibiotics, and tetanus shot simultaneously. If the patient suffers from inhalation burns, immediate intubation is required. In severe skin burns, if peripheral intravenous access cannot be achieved, central venous catheterization has to be performed while comforting patients as they scream in pain. Overall, we require a considerable amount of assistance," said Dir. Yiang.

In terms of medical supply, antibiotics, burn creams, IV drips, and gauze were prepared by the pharmacy staff and

property management team, providing sufficient logistic support to the frontline staff. To solace the anxiety of the family members, Supt. Chao awakened the volunteers from their dormitory to provide mental support for the distressed parents outside ER. Once the emergency treatment was completed, all the patients were transferred to ICU. At 2am, the department directors and social workers visited every single patient to understand their conditions and to discuss follow-ups.

To ensure that everyone involved is updated on the patients' conditions, Taipei Tzu Chi Hospital held a morning assembly every day at 8am, hosted by Supt.

Chao, with hospital directors, director of surgical department, director of nursing department, social workers, volunteers, and staff from engineering affairs, general affairs, social services, medical affairs, information center, humanities, and public relations, discussing in detail on the medical and administrative operations. At 12pm, an expert meeting is hold with frontline medical staff, including staff from department of plastic surgery, infection, rehabilitation, psychosomatic medicine, nephrology, cardiology, thoracic, metabolism, gastrointestinal hepatobiliary, anesthesia, ICU, and head nurse, supervisor, nutritionist, psychologist, respiratory therapist, and pharmacist. Together they discuss

the various perspective of every single patient's physical and mental condition in scrutinizing details, and develop future treatment plans accordingly. Over 160 medical staff across multiple disciplines were devoted to the care of these 12 patients.

Non-stop Debridement and Skin Grafting for Plastic Surgeons

Taipei Tzu Chi Hospital admitted 13 burn patients immediately after the dust explosion incident. One more patient transferred in later from another hospital and two transferred out, which came to a total of 12 patients admitted. After 48 hours of emergency treatments



Daily morning assembly and noon expert meeting to jointly discuss the next step in the treatment plan.



The medical staff performed surgeries day and night. Photo by Wang Shu-Wei.

to stabilize their conditions, these burn patients had to face their greatest challenge yet: infection. The Hospital set up a regulated burn area, managed by designated nursing staff, inside ICU where the burn patients were centralized, with positive pressure air conditioning to avoid infection. A video area was set up to allow the patients' families to observe and communicate with the patients via video feed. All of these measures were taken to eliminate any chance of infection.

During the initial stage of treatment, several patients developed compartment syndrome, where the compartment begins to swell due to tissue inflammation and venous occlusion, the

intercompartmental pressure continues to increase, causing impeded blood flow and eventually oxygen deprivation. The syndrome usually develops few hours or few days after the injury, which if left untreated, could result in muscle necrosis, secondary infection, nerve defects, gangrene, wound not healing, and even acute renal failure and death. The nurses closely observed the patients' limbs to identify any swellings or numbness, and arrange fasciotomy when necessary to release the intercompartmental pressure and improve blood circulation.

July 1, Dir. Lu Chun-De, Dr. Wang Shu-Wei, and Dr. Lin Chung-Chiao from plastic surgery began wound debridement,

where the dead skins are removed to avoid bacterial infection. Sometimes grafting and wound debridement were performed simultaneously to effectively reduce the burn surface. Three doctors, nurses, surgeon assistant, and anesthetist performed surgeries day and night, a surgical marathon that was a cruel test of their physical and mental endurance. Knowing that the team was understaffed, Dr. Yang Chih-Chao from Taichung Tzu Chi Hospital and Dr. Hsu Honda from Dalin Tzu Chi Hospital gave up their vacations to rotate with the exhausted staff, while Dr. Chuang Chun-Chi stayed for the entire month without taking a break in-between.

Improvised Ice Packs to Reduce Heat

When operating on patients with large surfaced burn, air conditioners in the operating room are switched off, and heat lamps on, to prevent the patients from hypothermia. The plastic surgeons have no options but to operate under a scorching 30 degrees Celsius temperature. Dr. Lu, who operated from 8am to 5pm, left the operating room with his entire garment soaked in sweat. Not one single drop of sweat can fall on the patient as it will risk infection.



While operating for these seriously burnt patients, the plastic surgeons demanded to turn off the air conditioning. Photo depicts Dr. Lu Chun-Te doing surgery with an ice bag on his back which OR nurses made for him.

The temperature in the operating room is usually set around 20 degrees Celsius where the bacteria are not too active, Dr. Lu explained, and in certain cardiac surgery, the temperature is lowered intentionally to reduce patient metabolism. When operating on burn patients, he added, the logic is reversed. When the patient's body temperature drops below 36 degrees, the exposed body surface would lose moisture rapidly. To sustain a safe body temperature throughout the surgery, all air conditioners in the operating room are to be switched off, with additional heat lamps in place.

The empathetic nursing staff already made preparations before surgery to ensure that the surgeons could operate in their best conditions. They filled surgical gloves with water and iced it in a freezer, placed the ice gloves inside plastic bags, tied it under the surgeons' surgical gowns to relief the heat.

In the middle of an operation, Dr. Lin received a bad news of his grandmother, who was suffering from colon obstruction and blood infection, was admitted into ICU after surgery. He was torn between his love for family and his obligation to the patient. "The saddest thing for the doctor is to be powerless when the family is ill," Dr. Lin said. "I know very well who needs me the most at this moment." Dr. Lin took the weekend off, rushed to the south to see his grandmother, and returned to his post the very next day.

Skin Grafting Machine Helps Accelerating Wound Healing

Autologous skin grafting, using patient's own skin in grafting, can accelerate the wound healing in burn patients. The skins for grafting are usually harvested from thigh, hips or scalp. In the case of the Formosa Fun Coast survivors, majority of their lower limbs were burnt, which leaves the scalp as the sole supply of skin grafting. To minimize the number of surgeries and the pain it may cause, Dr. Lin arranged two skin grafting machines that can extend the skins, hence increase coverage, to nine times of its original size. Harvesting 4% of the skin from the scalp, for example, and extend that by ten folds, and you will have 36%, which is enough to cover both legs. "When we speak of 1% in body surface burn," Dr. Lin explained, "we are referring to a burn surface equal to the size of a palm."

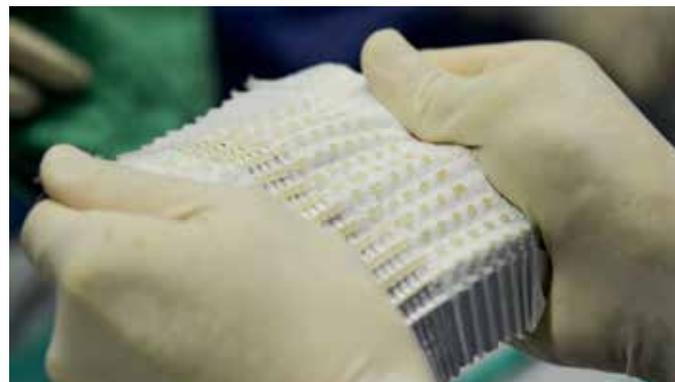
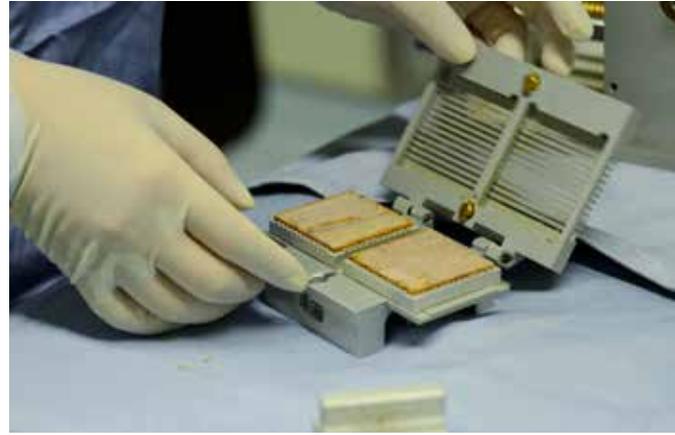
Skin grafting machines are particularly useful for patients with large body surface burn, Dr. Wang added. Harvest a piece of skin, and the machine will cut it to small square pieces. Spray these pieces with bio-adhesives, paste it onto artificial dressing, and it can stretch nine times the original surface when unfolded. A week later, the grafted skins begin to receive blood supply from the patient, which then continues to grow, accelerate healing, and lower overall death rate.

Mobilizing the Entire Nursing Team

While these 12 patients resided in the burn area in ICU, each wound dressing or video conferencing requires a great deal of nursing staff. Each patient needs to dress the wound twice daily, each time an hour or longer, and since it is an extremely complicated and elaborative process, 8 nurses are required working seamlessly to complete it. In the case where the patient could not speak, a nurse has to accompany that patient, report the patient's conditions in detail to the family members. Everyone gave everything to their assigned tasks, covering each other when needed, with no discrimination or complaints.

The head nurses of every department were responsible with the video conferencing. While the video conferences were being set up, the ICU nurses took the time to dress the wounds. Nurses from every department would, after finishing their own assignments, take shifts in ICU to cover for the ICU nurses. "Many nurses volunteered to take shifts in ICU. Someone of them just finished graveyard shifts, some of them were on vacation, and some were in the process of leaving the hospital," said Wu Chiu-Feng, the director of Nursing.

A strong family support allowed ICU Head Nurse Kang Fang-Yu to concentrate



The harvested skin is placed on a cork mat (top), cut by the skin grafting machine into many little squares (mid), and later transferred to artificial dressing where the skin is extended 9 times its original size (bottom).

fully on her job. “Why is mom not home? Can’t you come and do homework with me,” sometimes her child would ask. To that, she would clearly explain the tasks she was facing, “be good, there are many brothers and sisters in the hospital who needs my help.” Chen I-Ling, the head nurse of 11A, often brought her two children to the hospital, settle them down, and proceed straight to ICU. “There aren’t much I can do, so I want to do everything in my power to help out,” she said.

In response to the high demand of dressing staff, nurses who were experienced in intensive care or burn care teamed up into what was called a “dressing team”, with seven nurses a

team, two teams in rotation (day shift and night shift). Before each dressing session, the team would hold a meeting, discussing the dressing methods and wound conditions of each individual patient. With each surgery, wound debridement, grafting, and dressing methods change accordingly. With the end of each shift, the members would again gather together to discuss wound conditions and dress techniques. Thanks to Nurse Wang To-Jung, Chen Wen-Chun, Chen Huai-Yu, and Yu Wan-Ju who offered their support to Taipei Tzu Chi Hospital since June 28.

Supt. Chao was particularly grateful to senior nurse Wang To-Jung and Chen Wen-Chun. They hopped on the train

Wound dressing requires 8 nurses working together to complete.



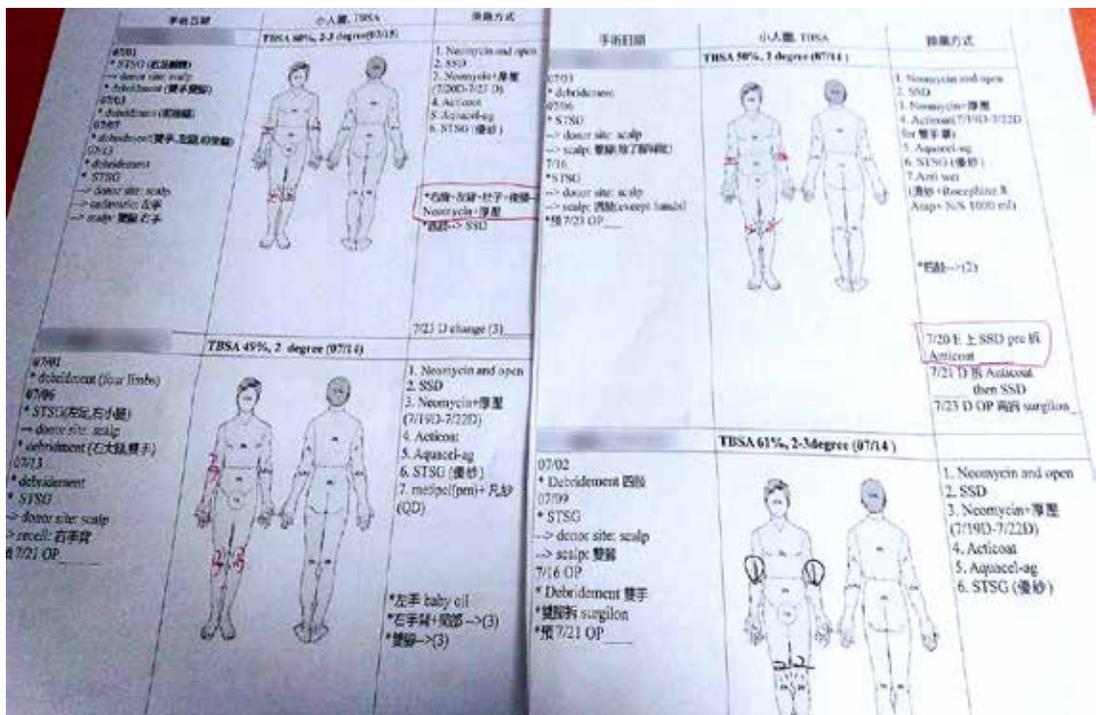
when the news broke, went directly into the ICU to dress wounds after they arrived, worked 12 hours a day, taught the dressing teams methods and techniques, and established the initial dressing flow process and charts. “Thanks to their strictness, allowing our patients to receive the best care possible,” Supt. Chao said.

“The day shift usually begin at 8am and finish at 2pm,” 10B Head Nurse Chen Shu-Chuan recalled. “One day, a team working day shift just finished dressing the wounds at 3pm. Just as they were about to sit down and take a well-deserved rest, these nurses overheard a patient who accidentally wetted the wound. They stood up, went back in and redressed

the wound.” During the first week, Nurse Chen felt as if her legs were no longer hers, aching and numbing all over. Human bodies are mysterious, though, she was used to it the second week.

Wound Dressing Manual for Nurses and Patients

From preparing medicine, undressing, unpacking, clean, dressing, apply crepe bandage, apply gauze, change bed sheet, to cleaning the patient’s body, every single procedure is critical. Eight nurses must each complete their assigned tasks. Injuries on different parts of the body must be dressed differently. “When dressing,



Wound dressing manuscripts.

everyone is responsible for a certain region where no one else can touch,” said Heart Lotus Ward Head Nurse Chen Mei-Hui. The strict rule is in place to avoid the risk of infection.

To shorten dressing time and minimizing patient pain, the nursing team developed their own dressing manual, documenting in detail the conditions, burned areas, and dressing procedures of individual patient. It is a perfect example of the mindfulness and patience of our nurses.

Dressing the wounds of a burn patient can be a delicate undertaking. Even the slightest movement when dressing can evoke excruciating pain. “Every time we undress the wound, a slightest touch

to the limb and the patient trembles in pain. We pause whenever they wail. The degree of pain is simply beyond our imagination. Patients who suffer from lung burn lacked the strength to cough on their own, we had to tap their back to assist the coughing. Every time, they would beg us to stop, and that is when our tears fall,” Lin Yu-Ting, senior nurse at ICU, said. Despite the pain, there were several patients who would endure and say, “thank you for everything!”

Consolation from nurses is an excellent alternative to anesthesia. When dressing wound, Head Nurse Kang Fang-Yu would comfort the patients, “I am going to clean the wound! Count with me, one, two, three! I am going clean again



Nurse setting up the equipment for video session.



Patient with wound dressed is now ready for visitors.

now,” distracting the patients from pain by keeping them engaged.

During the video session on the first day, Palliative Care Head Nurse Chen Mei-Hui had just completed dressing a 20 year old girl and accompanied her in the video chat with her family. The girl trembled in pain throughout the entire session. “Dad, do you still love me? I should’ve listened to you and not attend the party. Please, don’t be sad, I am sorry,” she said. “As soon as you recover, I will take you anywhere you want to go,” her father said, visibly holding his tears in. The dialogue repeated again and again, between parent and child in their first conversation since the incident.

Anesthetists Tried Keeping Pain Away

Pain, for burn patients, is a constant, haunting nightmare, which makes anesthesia a must in the treatment and recovery of burn patient. As the dust explosion survivors started to arrive at the Hospital, the anesthetists immediately reported to ER, performing central venous catheterization to maintain patient vital signs. They would be needed again in debridement and skin grafting once the patients stabilizes to administer general anesthesia.

One day after the incident, the



Dir. Huang Chun-Jen of Anesthesiology(right) and Dir. Kao Ming-Chang of Pain Clinic (mid) are assessing the dosage of narcotic analgesics.

Department of Anesthesiology organized a pain treatment team, responsible for pain relief, anesthesia, and acute and chronic pain management. They fully utilized the essence of empirical medicine, collecting and reviewing literature to discuss with experts of all fields involved.

Since the burn patients had to endure the skin-ripping pain twice a day, the medical staff would administer morphine prior to wound dressing. The amount, though, must be precise to relieve pain without placing them in deep sleep, risking the chance of never waking up.

During the initial phase (acute stage)

of the treatment, morphine remains the primary pain reliever, said Kao Ming-Chang, Director of Pain Clinic. Some hospitals introduced patient-controlled anesthesia (PCA), where the medication and dosage is regulated by an anesthetist depending on patients conditions, allowing patients to self-administer morphine for fast pain relief. Because burn patients admitted to Taipei Tzu Chi Hospital suffered large body surface burn including the limbs, which prohibited them from controlling their fingers, administration of intravenous morphine was decided as the primary pain relief method, in conjunction with non-morphine, neuralgia

or chronic pain medication, to reduce drug dependence and prevent chronic pain.

“I have been pondering, is morphine the only solution to the acute pain of these children,” Dir. Kao wondered. In the numerous discussions Dir. Kao had with experts, they all agreed on the benefit of administering large dosage of morphine to the patient, the thought of injecting these young people with schedule 1 substance on daily basis continued to keep him up at night. Intravenous injection is a fast and effective pain reliever, but fast pain relief can lead to dependency and eventually addiction. The concern haunted Dir. Kao until the administration of intravenous morphine discontinued.



Dir. Huang Hsuan-Li comforted Chang's anxiety and cleared her obstructed blood vessels with care.



Mr. Huang, who was particularly sensitive to pain, demanded the presence of pain physician when dressing. "When I see Dir. Kao, I see him as a guardian angel. He is like pain killer, whenever he is around, the pain is not as unbearable," Mr. Huang claimed. "Sometimes the patient is relieved simply by having us around. Our presence alone offers a psychological consolation. The profession and obligation of anesthetists and pain physicians is to help patients in identifying the most appropriate pain relieved, so they won't be scarred with a horrible memory throughout the treatment," Dir. Kao shared.

Peripheral Vascular Team Saving Injured Limbs

Chang, age 18, suffering from severe burn in her lower limbs, had trouble sleeping due to lower limb pain since hospitalized. The pain in her lower right limb persisted despite pain killers, Supt. Chao pointed out. He asked the director of Cardiovascular and Peripheral Vascular Center Dr. Huang Hsuan-Li to arrange a catheter examination, and the result indicated a 13cm blood clot lodged somewhere between her iliac artery and common femoral artery.

Dir. Huang frowned when he first saw Chang's result, the severity of the injury was worse than expected. "Blood flow to her right leg is restricted, a surgeon may recommend amputation. We used

vascular ultrasonography when dressing her wound to assess the blood flow, discovering that the blockage happened somewhere in the abdominal blood vessels, restricting blood flows from the heart to the right leg. It has a great impact on wound dressing and debridement, no blood flow means the risk of necrosis," Dir. Huang explained. If the blood vessels are not cleared in time, it could lead to amputation above the knee.

The peripheral vascular team used cardiac catheterization to clear Chang's abdominal artery, using guide wire and thrombectomy catheter to remove the 13cm blood clot, and opened up the restricted arteries with balloon angioplasty, placed a new type of blood stent to ensure unobstructed blood flow from the heart to the feet. Chang could finally have a good night sleep without the persistent, disrupting pain. Chang was Dir. Huang youngest patient, as well as his first burn patient, he did all he could for Chang despite the harsh challenges.

Although the artery in Chang's right leg opened up nicely days after the operation, many blood capillaries around the region remained clogged. A right leg amputation below the knee was performed to save her life. Considering how hard it must for Chang to accept, a hospital director contacted Chou Ya-ching, a girl who had her left lower limb amputated last year, to share her experience and challenges with Chang



Two months after the incident, the medical staff were excited as the young patients were discharged. The photo showed Vice Supt. Chang Yao-Jen and others walked the patient out of the hospital

and her family, letting them know that an amputee can still lead a splendid life.

Chang almost broke down when Supt. Chao broke the news to her about the amputation. Her mother, too, was saddened by the news. The encouragement from Chief Secretary Chiao, Social Worker Yang, and her classmates eventually calmed Chang's heart. After the amputation, Supt. Chao and Chief Secretary Chiao visited Chang often in her ward, Chang's classmates chat with her via internet, and Chou took her weekends to accompany Chang in her recovery. Two months later, Chang's condition finally stabilized and was transferred to general ward. Her mood, too, had stabilized. She was ready to face

the long rehabilitation ahead.

Out of the 12 burn patients admitted to Taipei Tzu Chi Hospital, one unfortunately passed away, the rest were transferred out of ICU into general ward, and few successfully discharged. The medical team used everything they had to save the lives of these young patients and console their fear and anxiety. Three month long treatment exhausted and fatigued countless hospital staff, some had fallen ill, but the treatment and accompaniment continued. The complete and unwavering trust from the patients and their family was the driving force that supported Taipei Tzu Chi Hospital team in their mission to save lives.

Mission Accomplished at the Critical Moment

Wu Da-Yu, Director, Pharmaceutical Department, Taipei Tzu Chi Hospital



Evaluations and inspections of hospitals require proper storage and handling of emergency medical supplies. The pharmaceutical department sets rules and regulations for the handling of special circumstances supplies. These

circumstances include large number of injuries, emergency disasters, explosion of wars, spreading of influenza, poisoning, and failure of procurement systems. For Taipei Tzu Chi Hospital, the first challenge of our emergency pharmaceutical system was

the disaster relief efforts of the Nepal earthquake.

On Sunday, April 20, 2015, I received a phone call from Superintendent Chao of the hospital. He informed me that the Tzu Chi Nepal earthquake relief team was departing the following day. I immediately contacted my colleagues who were participating at certain events in Miaoli, to return to the hospital as soon as possible. At about 11:00 pm that evening, 1,000 kg of medicines and supplies were ready for shipment for the first relief team. (Our medical relief team consisted of nine echelons, with a total amount of 1,410 kg of medicines)

In addition, evaluations and inspections also require a smooth flow of medical supplies in the case of emergency. The Formosa Fun Coast explosion was a more critical test of our system.

The accident occurred on Saturday evening June 27, 2015. Soon after the news broke, our group leader, Lin Kuan-Ling rushed to the hospital from her living quarter to join the pharmacists on duty, Hsu Yueh-Hsin and Huang Ya-Wen helped collected about 400 kg of supplies, such as IV fluids and burn patient ointments. It is worthwhile to mention that the pharmacists themselves weighted only about 40 kg on average, but they

were handling supplies ten times their weight.

In fact, the message we received was that the medical team required more than 200 cans of scald cream, which was about a month's consumption of our normal usage. This was beyond our normal storage amount. What could we do?

The first thing we could think of was to ask for help from our network. We contacted Hualien, Taichung and Dalin Tzu Chi Hospitals, and also sent messages to other neighboring hospitals. Fortunately, large quantity of scald cream and albumin injection were offered from these hospitals.

The second thing we did was to go to the source of the supplies. Even though it was a Sunday, we still went through different channels to contact personnel of the pharmaceutical company. The factory is located in Yilan, Taiwan. It just happened that our pharmacist Yu Wei-Ju went back to Yilan that Sunday. With the help of the Yu's family and the factory personnel on duty, they borrowed a truck and moved the medicine to Wei Ju's house. This move was proven to be correct. If we didn't have the medicine earlier, by Monday all other hospitals would go to the same factory and fight for the same medicine.

My original plan was to leave the

truck load of supplies with Wei-Ju in Yilan for the weekend. However, by Sunday afternoon, I received phone calls from the hospital informing me that the stocked scald cream was exhausted. We had no choice but to bring back the supplies from Yilan. Thanks for the help of the general team leader Chang Li-Der and colleague Lin Quan-Wan, they volunteered to drive to Yilan to pick up the supplies. They were stopped by the highway patrol on the way back to Taipei because of traffic control. With the explanation that the supplies were for emergency relief for the victims, the patrol officer

released the truck. On Sunday evening, the health bureau of New Taipei city also collected certain amount of medicine and scald cream, so we could share a proper amount to join effort. By Monday morning, we were short of IV fluid. At 7 am in the morning our colleague Chang Wen-Chiang was sent to the factory in Shinjo to pick up 180 kg of IV fluids.

The third route was to get help from the government. The Ministry of Health and Welfare established a “Line” group especially for the supply of medicine and medical supplies for victims. Through this group, we



As the typhoon Chong Hon approaching, Pharmacist Chang Wen-Chian and colleague from the General Team were dispatched to Pharmaceutical factory in Yilan to pick up 200 cans of medicine.



Hsu Yueh-Hsin of the Pharmaceutical Department checked out the IV fluids and burn patient ointments, immediately after she was informed of the emergency.

informed the officials the amount of supplies we need. The Ministry then contacted the suppliers to increase supply. By Wednesday, we stocked up 3,287 cans or 16 different types of scalded cream from five manufacturers with six different brands. This is because no single manufacturer alone can provide the amount we needed.

After the initial critical period, the manufacturer caught up with demands. As we were welcoming the relief, on Thursday, 9th of July, the weather bureau issued a typhoon alert. Typhoon Chan-Hom was approaching and rain started to fall that evening. I received phone call from the Head of our

nursing department, Wu Chiu-Feng. The message was that our Betadine ointment would be exhausted by next morning. I was riding my motorcycle in the rain, sending my child home. Without hesitation, I stopped my bike under an arcade and called my colleagues to find solutions. Our pharmacist in charge of the medicine storage, Yu Wei-Ju, already had the first message. She rushed back to the hospital and made arrangement for the kids. We made many phone calls to several nearby hospitals. Unfortunately, none of them had the medicine. Eventually, we located a different brand name medicine at the Shin Kong Wu Ho-Su Memorial Hospital. Since we had the need the next morning, the General Affairs team dispatched a vehicle and brought Wei-Ju to Shin Kong Hospital to get the ointment, at nine in the evening.

The immediate problem was solved, but Wei and I must come up with a solution for the long run. We contacted the manufacturer in Taoyuan. But they told us flatly that they could not come up with what we need. Our last resort was then the same pharmaceutical factory in Yilan. They did produce Betadine Ointment with the same composition. We decided to borrow the medicine from them and pick them up the next morning.

At the time all the details were sorted out, my son joyfully announced that school was cancelled because of the typhoon. That news worried me because weather condition might shut down the Yilan pharmaceutical factory. Luckily, the Yilan factory was business as usual the following day. Before 7 am, Chang Wen-Chian of our medicine storage and Lin Quan-Wen from the general team were dispatched to Yilan to pick up the 200 cans of the loaned ointment.

Overall, through this episode of emergency medicine collection, we travelled about 300 kilometers and picked up about 2,400 kilograms of various medicines. Hospital evaluation

rules require that in case of emergency, three days of medical supplies must be available. From the Formosa Fun Coast explosion experience, we learned a way to keep our supply uninterrupted, even though we have to use up 30 days of normal consumption in a single day. This is what our management called “Mission Accomplished at the Critical Moment”. This is what we called responsibility. With our mission accomplished, we sincerely appreciate the seamless coordination from departments such as Resource Management Department, and General Team of the Hospital. Without their full hearted cooperation, our mission would not be accomplished so smoothly.



The first few days after the Formosa Fun Coast explosion, colleagues of our Pharmaceutical Department were required to check our inventory daily. Picture shows our dressing supplies on the fourth day after the incident.



Continuity of the Supply Line

Cheng Chien-Fang

The deadly Formosa Fun Coast explosion occurred on a holiday. Without warning, over ten burned patients were rushed into our hospital. A quick overview found that the required medicine and medical equipment far exceeded our ordinary inventory. Luckily, under the flawless coordination of our Pharmaceutical and facility department, supplies were delivered to our front line medical workers.

Wu Ching-Hua, Director of our general affairs office, recalled the orderly support provided by different branches of the hospital. The responsible person at the facility, Chang Li-Te, and the Head of Occupational Safety, Tang Ming-Hsun, personally drove to our Chiang Ling living quarters to pick up the medical professionals. Lee Ming-Lan, Chief of the facility, heard the news from television and drove all the way back to the hospital from her



The small storage area supports external emergency unit at the Taipei Tzu Chi Hospital.



Lee Ming-Lan (center) of the facility group helping Ward 9A to acquire needed supplies.

home in Longtan, Taoyuan. As soon as Lee arrived, she did not waste time to prepare a list of necessary medicines and equipment. She also contacted all nearby Tzu Chi hospitals to assure that the needs could be delivered to us in time.

The emergency burn care units' supplies include: intravenous infusion machines, fluids, scald gauzes, cotton sheets, ointments, antibiotics, blades, sterile gloves, skin rolling machine, etc. Furthermore, all supplies must be delivered to the front line in very short time. The first two-week is critical to the severely burnt patients, and therefore, the quantity of supplies has to be larger. In order for the front line medical personnel to have adequate inventory, a running supply line flow is also critical.

“At the beginning, burnt patients often have excess fluid and blood on their wounds. Frequent changes of the wrapping materials are necessary. A nonstop sterilization of the wrapping material is performed at the supply center. As an indicator of the work load at the supply center, the wrapping materials are still warm when arriving at the ward.” Director Wu Ching-Hua, “In addition, the frequent changes of dressings, create vast of medical wastes - a burden to the service maids.”

With the medicines and medical supplies flowing smoothly, Director Wu said gratefully, “Thanks for our hard working colleagues, we have a strong and wonderful team.”

Because the wound areas for most of the patients are quite large, the service line of the Emergency Unit must be adjusted in order to reduce the risk of infection. First, the burn patients are housed in a special area. Then the medicine personnel are directed to enter and exit according to a special one-way route. This way, infection and other medical complication can be minimized.

Also, visitors and family members can only communicate with the patients via video conferencing. Patients can talk to their loved ones without the worries of infection.

Huang Shao-Fu, Information Services Director, indicated that in the evening of June 29th he received telephone calls from the Chiao Li-Hua and Nursing Director Wu Chiu-Feng, inquiring the possibility of setting up video conferencing between patients and their families. Director Huang immediately consulted his team for the most efficient method for video conferencing. He also wanted to find out all the details to setup proper equipment.

In order to achieve stable video



Director of Information Services, Huang Shao-Fu(left), and colleagues are testing computer network with tablet computers.



quality and platform, Assistant Director of Information Services, Chen Ling Jun, also provided on-site assistance. After a series of tests with broad band channel to reduce disturbances, a best image and video quality were achieved.

With ingenuity of the information sciences team, the worries of the patients were greatly reduced. Tablet

computers were used for video conferencing. Through video images, the patients and family members chatted casually, warmly exchanged words of comfort. This way, the patients were inspired to calmly receive treatments, with the accompanying of family members.



Plastic Surgeon, Dr. Lin Chung-Chiao (center, dressed in blue), is explaining to family members of the patients about the necessity of video-conferencing.

Discharged, HAO Wanted to Say...

What Hao Wanted to Say to the Hospital Staff?

Dr. Wang and all the nurses at the ICU of Taipei Tzu Chi Hospital are among the most memorable. Most of the time, I had received morphine, which resulted in delirium. ICU was busy and hectic and everyone having multiple tasks to complete. Initially, they had to begin wound cleansing and needed four nurses to assist care as we scream in pain. The nurses needed to endure our screams and continue with the wound care. It was really hard! Due to the changes in shifts and their work hours were hard and long. I was in bed, watching them most of the time. I hope that the hospital or the government will give these medical staff praise, encouragement or reward because they were very tired, really, really tired. Whatever I lost - the injury is minor. I was reborn because of Dr. Wang Shu-Wei.



Hao was the first Formosa Fun Coast Explosion victim discharged from the Taipei Tzu Chi Hospital. Hao and his parents attended a news conference.

How to survive debridement and dressing?

My skin felt so tight when I walked. I must stretch it to recover its elasticity. During rehabilitation, I did not give up because I know this was a necessary process. If I wanted to recover soon, I must give it all I have. What was most memorable was the second time when I was accompanied to see the turtles in the pond at the 5th floor garden. Initially, I was bored, but later I felt I was reborn. Dr. Wang was with me. He is like my older brother. I said many things while I cried, thanking Shu-Wei for what he had done for me, especially during the unstable stages in the ICU. For my own sake, he kept the truth of the passing of some of my friends. When I was later transferred to a regular ward and upon learning the truth, I was really depressed. He told me my goal was to survive and live to the fullest for myself and my deceased friends. In addition to my physical rehabilitation, that was also the main reason for my rebirth.

How I felt upon discharge from the ICU?

My father berates often; however, the first time he visited me in the ICU, he frowned and couldn't speak. When I told him that "I'm alright", he began to cry. My father is a very "manly" type of person. Seeing him cry, I cried too. Previous, we rarely talked but when he departed that day, I told him, "I really love you!"

When I was transferred to a regular ward and learned of people dying on the news, I felt really bad. I felt goosebumps everywhere. I continuously asked myself, "Why? Please don't have any more casualties!" When I saw the good news of individuals being transferred to regular wards or being discharged, I was really happy for them.

Planning post Discharge?

I've experienced it! I'm no longer afraid! But I pray it will never happen again! I shall precede the future with optimism. In the near future, I wish successful rehabilitation, go back to school on time, return back to my usual life, and believe that these scars will not affect my life.

No Longer Alone When Joining Others to Help in Rehabilitation

Wu Yen-Ping
Translated by: Doris Shieh

“My selfish wish to have fun is what caused this accident. Although I am the one with injuries, my parents are hardest hit because they have to care for me,” confessed Zheng whose childish face was full of regrets and shame.

Zheng was going to be a junior high this fall. On June 27, 2015, she and other classmates attended the event at the Formosa Fun Coast when an explosion happened. She was ambulated to the Taipei Tzu Chi Hospital at 12:28 am with 2nd and 3rd degree burns covering 40% of her body. Under the care of the burn unit staff and her fighting spirit, she recovered smoothly. She was discharged on July 31, after 34 days of hospitalization and a full assessment of her condition by her attending physician Dr. Lin Chung-Chiao.

During her hospitalization, she underwent numerous wound debridement procedures and multiple skin grafts on her bottom limb and



Hugging her dad, Zheng speaks of her regrets.

left hand. She expressed tenacity and optimistic throughout the ordeal, and was grateful to others who cared for her. “When I was in the ICU, my family was always here during morning and evening visiting hours. They prepared and brought lunches or dinners and I am so thankful for them.” Zheng expressed her appreciation to her family members as well as to the nursing staff, “They painstakingly cleanse our



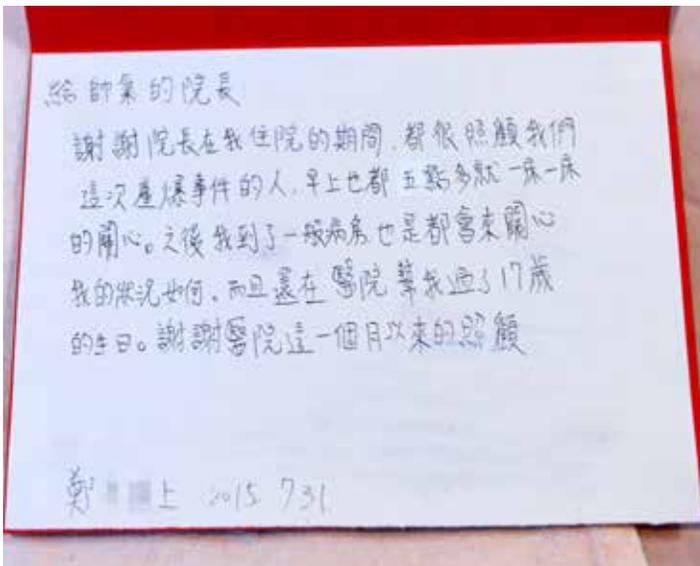
Nursing staff helping Zheng get ready to be discharged, wishing her smooth road to recovery.

wounds to prevent infection. During dressing change, they always spoke of encouraging words to support us when the pain seemed unbearable. They were our cheerleaders and we see all the hard work they have done.”

Doctors are like our parents. After taking over the treatment of the dust explosion young victims, Superintendent Chao You-Chen would make his rounds and visit the ICU patient’s everyday around five in the morning regardless of his busy schedule. All these small gestures did not go unnoticed. Zheng said, “He cared about our injuries. He asked if we had any discomfort. He was kind and friendly like a father.” The day of her discharge, Zheng handwrote a card and walked over to Chao’s clinic

office hour to pay her appreciation to “Chao Dad”. She handed over the card with both hands and said, “Thank you Chao Dad for checking on us daily. When we see your smile it was as if our own dad was smiling at us. I will try to get better so that I can help others for their recovery.” Chao was delighted by her maturity and positive thinking.

Zheng was an outgoing individual who quickly became a part of the extended family with the nursing staff. She became the little sister to the nursing staff of comparable age. Zheng was jubilant on her 17th birthday and the day of her discharge when the department manager and her medical care team prepared a special cake to celebrate with her.



Before her discharge, Zheng pays a visit to “Chao Dad” (Superintendent Chao You-Chen) at his clinic with a hand-written card to show her appreciation.

The day before her discharge, the medical team visited her home to assess home safety, environmental health condition, mobility route, wound care and proper bathroom setup, etc. Volunteers also mapped and estimated her route to return home via public transit. All these assessments were geared to help her transition to normal life a little easier.

To reduce her parents' concern, Zheng gave her 100% cooperation during rehabilitation. “If I don't

recover, then I would become a burden to my dad and mom. It would be more difficult for them. If I am diligent about my rehabilitation, then it will make my parents' life easier." Zheng was confident about her road to full recovery. She also encouraged other victims to start their rehabilitation as soon as they are able. "We can even form our own rehabilitation group! We can chat and walk or talk as we squat. Someone will always be with you and you won't be alone."

When asked about what she thought of the incident, Zheng's tone turned solemn and calculating. "We must be aware where we party in the future. Try to avoid unsafe activities and places otherwise we will just make our parents worry." An unexpected dust explosion put her through indescribable pain. However, this painful experience also made her recognize her parents' concern and became a more accommodating and understanding person.



The day before discharge, the medical team conducted home visit to evaluate suitability of Zheng's living situation.

A Burn Mark That Blossoms

Chiu Hsin-Ling, Nurse Practitioner of Neurology, Taipei Tzu Chi Hospital



Once a burn victim herself, Neurology Nurse Practitioner Chiu Hsin-Ling shares her experience.

I was a burn victim by accident in my childhood. The treatment and rehabilitation were toilsome. At times, the pain from scar contracture would turn me away from daily therapy. Fortunately, my mother was always there for my company and to help me live my new life. I was grateful to the medical staff for their meticulous care; so I resolved to save other's life. I am now a member of the medical professionals.

I was on vacation outside of Taiwan at the time of Formosa Fun Coast Water Park incident. The news took me back to my own memories. I can totally relate to the pain and struggle these victims have to endure. More than just physical suffering, it would be an everlasting emotional trauma. Formidable challenges were crushing down on not only the victims but also their families and friends, if the victims were lucky enough to live. I was compelled to step forward and use my own experience to hopefully hearten victims and their families.

Since returning to work on June 30th, 2015, I visited the ICUs in my off-hours and shared my firsthand experience with families to calm their nerves. I told them I am a veteran nurse, "Although the wounds are painful, one should enlist rehabilitation specialists at the very beginning to help ease the recovery, things like positioning and contracture exercises to de-scar. The body and physical functions will recover better." Areas such as joints and thickened skin are more difficult to heal



so they are limper. A rehab specialist will provide the best assistance to suit each individual's different needs. The scars are less sensitive to temperature so patients should stay in a cool environment and to avoid injury. These were some of the rehab experiences that I shared with the victims and their families. The hardship can only be comprehended if one is in their situation. I am grateful that I am able to give back to my community and to help those in need with my own experience.

These young victims often cried about their physical pain and grieved the emotional scar. I told them, "It's ok to let them all out. But you still need to deal with the reality afterward. Do you want your family to worry about you?"

They responded contentedly, "No, I don't want Mom and Dad to worry. I will make a fast recovery!"

For those who were distraught by their altered appearances, I consoled them that we would all get old and become unattractive, they just had their turn earlier. I answered their questions, including how the scars would look like, how to wear a compress suit, and would rehab be painful, etc. I rolled up my sleeves to demonstrate each rehab movement so that their families would be mindful of the needed assistance. I even set up an online group for everyone to share information and be each other's moral support.

As soon as patients were able to raise their hands or feet, I immediately



Chiu Hsin-Ling visits victims in her off-duty hours to boost the morale.

gave them applause.

“Today’s toil paves way for tomorrow’s success. Being laid back now is merciless to the future. Take one more step every day and the goal will soon be reached.”

My mother said I was only able to somewhat move my fingers when I was just transferred out of the ward. After a long and hard rehab journey, I now function completely as normal. I was an all star cheerleader in my school days. This year I even ran a 21-kilometer half-marathon and completed a triathlon. After hearing my “medal decorated” life stories, some patients promised to do

triathlon, some wanted to train to regain their shapes, and one even planned to race-climb Taipei 101. It was my hope that my story could bring faith and courage to the burn victims.

The sufferings that burn patients go through during treatment and rehab are indescribable. It is plain painful. My burn marks are one of a kind. They proved that even accidents can make possible a wonderful life and a meaningful existence. I will continue making rounds between hospital rooms to help whoever is in need, whether they are in the hospital or discharged.

The Challenge of Pain Relief for Burn Survivors

Dr. Kao Ming-Chang, Director of Anesthesiology and Pain Clinic, Taipei Tzu Chi Hospital



In the night on June 27, all anesthesiologists rushed to the ER to do endo intubation, central venous catheter, and artery line for victims.

The general perception of an anesthetist is to administer surgical anesthesia inside operating room. In reality, a great deal of our work happens outside the operating room, especially in life-threatening situations. When Green Nine (emergency) is announced, we anesthetists would rush to the scene and begin resuscitation, emergency treatment, and intubation. On June 27, 2016, the eve of the Formosa Fun Coast dust explosion, we were there at ER to assist intubation and the insertion of central venous and artery catheter. Stabilizing patient vital signs is another specialty of the anesthetist. Our

training requires us to have an intricate knowledge of internal and external diseases and organ systems, as well as the use of all acute and chronic pain relievers. In the incident of the waterpark dust explosion, pain physicians were heavily involved in the pain management of all burn patients.

Burnt Fingers Prohibit Self-Administering Pain Relief

Shortly after the explosion, under the order of Taipei Tzu Chi Hospital Supt. Chao You-Chen and the Department of Anesthesiology Dir. Huang Chun-



During the operation for a seriously burn patient, even the anesthesiologist and many other staff would assist to hold the leg high for hours.

Jen, we assembled an anesthetic and pain management team, focusing on pain relieving for the patients in the treatment to come. The first thought was the installation of patient-controlled analgesia that allows patients to self-regulate the dosage of morphine. Upon further investigation, out of the 13 patients, 12 of them suffered severe burns to the finger, making it impossible to operate the pressure switch. To effectively relieve the intense, excruciating pain from burn injury, it was up to the nurses to regulate the flow rate of the infusion pumps, continuing the administration of venous morphine.

The addiction to morphine soon became the concerns of the family when morphine analgesia is the only effective pain reliever during debridement, grafting, and dressing of large body surface burn, and the medical staff had exercise caution when facing the risk of morphine tolerance and dependence. Under the professional control and monitoring of the medical team and the pain physicians, we successfully alleviated pain and avoided tolerance and dependence of morphine analgesia.

Accurate Venous and Artery Catheterization and Pain Relief

Aside from administering anesthesia during debridement and skin grafting, the

anesthesia team is also responsible for the insertion and replacement of central venous and artery catheters, since the burn patients with severe damage to the skins have no usable peripheral blood vessels. Thanks to the solid training, we completed each catheter insertion with ultrasound guidance. Another role we fulfill is the venous anesthesia and pain management inside ICU during a comprehensive wound dressing. It was done to minimize any psychological scars these patients may suffer from the extreme pain during wound dressing. The pain management team of Taipei Tzu Chi Hospital accomplished greatness in this regard.

An Intricate Balance of Effective Pain Relief and Morphine Dependency

As the treatment extended into week two, the subacute phase, the threat of death gradually subsided. What a pain physician has to think about is the prevention of tolerance and dependence of morphine analgesia from large dosage administration. Tolerance refers to the increase in dosage of morphine analgesia to achieve the same effect as before; dependence refers to the euphoria of rapid pain relief from venous morphine injection that could lead to dependence. In treatment, we rotate the venous morphine analgesia used

to avoid tolerance from large dosage. Once the patients could ingest oral medication, we immediately switched to oral morphine, which could minimize the euphoria, and hence dependence, from injection. During the initial stage of burn treatment, we administered medication to treat neuropathic and chronic pain via nasal catheters, successfully managed the patients' pain to a scale of 0 to 3 from the original 10, without the administration of large doses of morphine analgesia.

As a pain physician trained in the department of anesthesia, with years of experience with morphine analgesia, and knowing full well the correct administration and management of controlled substances will not lead to addiction, whenever I thought about the fact that 13 young lives were using venous morphine analgesia 24 hours non-stop, it kept me at night. Morphine and heroin are both schedule 1 drugs, after all, I could never erase my guilt if any one of these young people develop dependency. Fortunately before the end of second week, most of the patients changed to oral morphine, and I was relieved.

We Are Here, Pain Is Not

From week two to week four, debridement and skin grafting had

completed, and we were finally in the recovery stage. In this stage, non-morphine analgesics, combined with a small dose of oral morphine, can reach a desirable pain relief. One month into treatment, except for two or three patients who required morphine after surgery or wound dressing, most were off any sort of morphine analgesics. As they continue to recover from the merciless fire, the joy and the thrill of watching these patients relieved from pain without developing morphine dependency was incredibly satisfying.

With the growing skin comes the pain from rehabilitation and scar contracture, and the chronic pain that might develop later. At the time of the injury, the skin, together with the nerves underneath, receive severe damage. Once nerves are damaged, neuropathic pain such as extreme itching, prickling, tingling, and burning, or hyperalgesia and paresthesia, can develop during recovery, which in time may progress into chronic pain. Fortunately, we started using neuromodulators, like the new calcium channel blocker Lyrica, in the early stages of the treatment, which could drastically reduce the pain and itch during recovery and prevent or reduce the development of chronic pain.

I had felt, while caring for these children, their trust and dependence on the anesthetic and pain management

team. I recalled a patient, overwhelmed by a sudden pain at 1am, immediately called an anesthetist, as it was the first thought to cross his mind; another patient always requested an anesthetist during wound dressing, for simply by having an anesthetist around, even without the administration of analgesics, is sufficient to relieve his overwhelming anxiety and pain. Our

intervention throughout the treatment had brought them a strong sense of security. As tired as we were, I was glad that he relied on us, not morphine. Watching these young patients discharged one by one under the care and effort of Taipei Tzu Chi Hospital, it was the best reward we could ask for. We hope that every single one of them can soon return to their life.



When a burn patient got his/her skin back gradually, the task of the anesthesiologist would be to lower his/her chronic pain during recovery.

The Highest Standard of Nutrition Care

Chang Ya-Lin, Taipei Tzu Chi Hospital dietitian

Which beds are burn patients? Can they eat? How big is the burn area?

On Monday, June 29, 2015, I visited the Surgical Intensive Care Unit to examine burn patients. Even with a decade of clinical experience, I was afraid of neglecting any of the assessments for my first time.

After really seeing the patients, I realized how serious it was - patients' conditions were worse than expected. There were several patients who were eating and even chatting with me, but a few hours later, they suddenly required intubation...

During this period of time, I stayed morning and evening in the burn ward - seeing the horrible open wounds, hearing the cries of patients, and watching anxious families and the emotional breakdown of nurses. Pressure was building because every



personnel in the whole hospital were involved. After work I continued to search for information until late at night. In retrospect, it was really a lifetime of unforgettable experience. The incident had happened for two to three months, but every time I had the opportunity to share, I still can't stop the tears. In fact,



Dietitian Chang Ya-Lin feeding one of the burn patient in ICU.

crying is not just for the pain, but for the hearts being touched.

“Nutrition” plays an important role for burn patients from beginning to end. At the beginning, gastrointestinal function and immune function maintenance is established, followed with debridement, skin graft, skin regrowth, the removal of the respirator, against a variety of bacterial invasion, and to support patients’ rehabilitation. Nutrition care starts from the admission, and can’t be interrupted until patient rehabilitation is completed.

Owing to the diverse food information from the internet or TV, family members, and even medical staff, raised all kinds of magical food and diet questions. To deal with this situation,

hospital held more than one symposium on the diet for burn patients. Also, we talked to the patients to explain the most appropriate food and the importance of nutrition. Superintendent emphasized throughout the communication that vegetarian diet is absolutely adequate in nutritional values so that patients and their families should feel at ease and rest assured. Wound recovery and skin regrowth rate was as expected, then patients smoothly moved out of the intensive care unit one by one.

Thanks to the Superintendent and supervisors for their attention on nutrition care for burn patients. We are more confident and strive to become the best as a nutritionist, and continue to give patients the best nutrition care.

Dust Explosion Accident

Taipei Tzu Chi Hospital Processing Time Table

2015

June 27

- 20:40 Dust Explosion at Formosa Fun Coast
- 22:47 First patient was admitted to Taipei Tzu Chi Hospital ER by family members.
- 23:06 Ambulance transported patients to the Hospital. Mass casualty incident protocol and bed arrangement initiated, about 120 hospital staff returned to their post and joined the emergency treatment.

June 28

- As of 00:33, 13 trauma patients were admitted, with an average of 60% body surface burn. Patients were transferred to ICU after emergency treatment.
- Supt. Chao You-Chen handed each patient NTD30,000 relief money on behalf of Master Cheng Yen.
- New Taipei City Government established a Formosa Fun Coast Survivor Service Center in the Hospital.
- Hualien Tzu Chi Hospital Surgical ICU Nurse Chen Wen-Chun and Wang To-Jung arrived in Taipei to support.

June 29

- 08:00 Supt. Chao You-Chen called an emergency meeting and instruct response measures.

- Taipei Tzu Chi Hospital set up a hotline for consultations relating to Formosa Fun Coast incident.
- A blessing prayer was held, with over 300 attendees, to pray for the survivors of Formosa Fun Coast explosion.
- Taichung Tzu Chi Hospital Supt. Chien Sou-Hsin arrived at Taipei Tzu Chi Hospital to inquire the staffing of plastic surgeons.

June 30

- A burn area was demarcated inside surgical ICU where the 12 patients were centralized, with positive pressure ventilation, access routes plotted and regulated.
- Information Center setup internet access and provided video chat to the patients and families.

July 2

A press conference was held on the nutritional treatment of Formosa Fun Coast Survivors through nasal duodenal tube.

July 3

Hualien Tzu Chi Hospital Surgical ICU Nurse Chen Huai-Yu and Yu Wan-Ju came to assist.

July 5

Supt. Chao and the Foundation directors discussed a cooperating mechanism with Sunshine Social Welfare Foundation.

July 6

A press conference was held on the minimization of limb contraction during rehabilitation.

July 8

Occupational therapist and social workers from the Sunshine Foundation visited the Hospital to discuss patient rehabilitation plans.

July 9

- Dalin Tzu Chi Hospital Plastic Surgeon Hsu Honda and Anesthetic Head Nurse Lin Hui-Mei arrived to support.
- Cardiology Director Huang Hsuan-Li completed stent placement inside Zhang's right popliteal artery.

July 10

- Masters from Jing-Si Abode visited the survivors and encouraged the staff.
- Teachers and students from Tzu Chi College of Technology visit their injured classmates Peng x-Yu and Chang x-En.
- Patient Chiang x-Hao was transferred to general ward.

July 11

- Patients received blessing cards from the Abode Masters and the Foundation's Religious Dept. Staff.

- Supt. Chao and Head Nurses celebrated Chang x-Hsuan's 17th birthday with presents and cake from Master Cheng Yen.
- A blessing prayer was held with over 800 attendees to bless for the explosion survivors.

July 12

- A press conference was held at 10am, announcing the decease of Huang x-Hsuan with 93% body surface burn.
- 363 Tzu Chi volunteers recited for Huang. New Taipei City Deputy Mayor Hou You-I visit the family members.

July 13

- Taichung Tzu Chi Hospital Nurse Chang Pi-Shan and Chang Hua-Ju came to assist.
- Patient Chen x-Hsuan was transferred to general ward.

July 14

- Patient Lin x-Ting regained consciousness after taken off ECMO.
- Sunshine Foundation held a Formosa Fun Coast Dust Explosion Family Forum.

July 16

- A second surgical attempt to clear Patient Chang x-Hsuan's blood vessel in the lower right limb via cardiac catheterization.
- Patient Chao x-Ting extubed.

July 17

- Vice Supt. Chang Yao-Jen and the medical team conducted home visit to Chiang's home before discharge.
- Peripheral vascular team Dir. Huang Hsuan-Li cleared Chang's abdominal artery.

July 18

Dir. Du Hsiu-Hsiu of Sunshine House, Sunshine Foundation gave a lecture at the international conference hall of Taipei Tzu Chi Hospital on "Physical and Psychological Reconstruction of Burn Patient". Over 4,000 volunteers nationwide sat in on the lecture via video conference.

July 20

Amputee Chou Ya-Ching shared her story with Chang to prepare him for the challenges to come.

July 21

- Sister Hsu Mei-Chueh, Dept. of Religion, Taipei Branch and her team visited the Hospital to discuss the follow-up after patient discharge.
- Patient Chang amputated her right leg below the knee.

July 22

- Patient Chung extubed and began spontaneous breathing.
- Patient Huang was transferred to general ward.

July 23

A press conference was held for Patient Chiang's discharge.

July 24

Taipei Tzu Chi Hospital assisted the family in the memorial of Huang.

July 26

Taichng Tzu Chi Hospital Supt. Chien Sou-Hsin sent handmade toasts from staff to comfort the medical staff.

July 27

- Received the quota from the Ministry of Social Welfare the last two quota of Japanese newly developed autologous skin grafting. The company came to explain this new skill.
- Patient Chao was transferred to general ward.

July 28

- Patient Chang x-En was transferred to general ward.
- Patient Chen was transferred to general ward.

July 30

- Vice Supt. Shyu Rong-Yuan and the medical team conducted home visit to Chen x-Hsuan home before discharge.
- Patient Lin x-Ting was taken off dialysis.
- Patient Chang was transferred to general ward.

July 31

Patient Chen x-Hsuan was discharged.

August 01

Patient Peng x-Yu was transferred to general ward.

August 03

Patient Lin x-Ting was transferred to general ward.

August 04

Dalin Tzu Chi Hospital Nurse Tu An-Chien came to Taipei Tzu Chi Hospital to prepare for the transfer of two Yunlin patients.

August 10

- Patient Chen x-Yin and Peng x-Yu began hyperbaric oxygen therapy.
- Patient Chang x-Hsuan was transferred to general ward.

August 11

“Friends of Tzu Chi” Association donated a light therapy apparatus which can facilitate wound healing.

August 12

- Six Abode Masters arrived at Taipei Tzu Chi Hospital to speak to the team and visit burn patients in their wards.
- Patient Huang x-Hsien was transferred to general ward.

August 13

Social workers and the medical team conducted home visit to Chen x-Yin home before discharge.

August 17

- Patient Chen x-Yin was discharged.
- Last patient Chung x-Chieh was transferred to general ward.

August 21

Patient Chang x-En was discharged.

August 26

Patient Peng x-Yu and Chao x-Ting were discharged.

August 31

- Patient Chang x-Yu was discharged.
- Lin x-Ting, Chang x-Hsuan, Chung x-Chieh were later discharged in September.





Love Represented with Clusters of Grapes

By Chang Yu-Hui, Chen Wen-Shei, and Peng Wei-Jun

On the 27th of June 2015, flammable starch-based powder exploded at the Formosa Fun Coast, a recreational water park in Bali, New Taipei, Taiwan. Twenty-five years old Liu Kou-Sheng was trying to save his girlfriend and suffered a 70 percent burn over his body. He was sent to Mackay Memorial Hospital for emergency treatment.

“The accident was so sudden, our lives were wrecked. We couldn’t take care of our vineyard. With heavy rain, we lost over 60 percent of our crops.” Liu’s father was sad because he needed to go to Taipei to take care of his son and also the vineyard business.

Liu Kou-Sheng’s father has a vineyard in Nantou county, Shin-Yi town. In order to take care of his wounded son, he had to travel frequently between the two places. The month of July is

harvest time, but it is also a typhoon season. There was already a warning for a major typhoon, he must harvest his grapes or his effort for the year would go down the drain.

Tzu Chi volunteers answered Liu’s call by mobilizing available personnel to pick and box the grapes before the typhoon arrived. Thus, the Liu’s family could take care of their son in the hospital. From July 7th to July 8th, and from July 20th to 21st, two tiers of volunteers totaled more than 200 people, harvested more than seven thousand pounds of grapes.

These grapes were purchased by volunteers from Tzu Chi as well as many kind-hearted people, and then delivered to 57 hospitals as an appreciation for their dedication to save lives.

“I really appreciate the help from Tzu Chi volunteers; otherwise, I wouldn’t

be able to harvest grapes. Thank you for your help to reduce our stress, I really appreciate. I wish our son will recover soon; so we can accompany him to encourage others,” said the parents of Liu Kou-Sheng with sincere appreciation.

On the morning of July 8th, when those grapes filled with love were delivered to Hualien Tzu Chi hospitals which received 3 burn

patients. Kao Ruey-Ho, former hospital Superintendent and Director of Nursing Chang Shu-Chuan delivered these 30 boxes of grapes to the emergency room staff, surgical ICU units, burn care center, plastic surgery unit, and the physical therapy unit to show their appreciation. The staff expressed that it was their responsibility to help the victims, and hoped everyone would stay strong and return home safe.



Other medical units all sent the messages through the LINE app to express their appreciation to Tzu Chi after they received the grapes.

The following are LINE messages from the hospitals that received the grapes.

Yilan Lotung
Poh-Ai Hospital

Thank you Tzu Chi for delivering these special grapes filled with love, we have already disseminated them to our staff.

Shin Kong Wu
Ho-Su Memorial
Hospital

Thank you for Tzu Chi's participation and caring for the families. We always appreciate Tzu Chi's help and invite them to take pictures with us as a memoir whenever our senior officers are here.

En Chu Kong
Hospital

We appreciate the love Tzu Chi expressed to the society. We received the precious grapes and shared them with our staff.

Chung Shan
Medical University
Hospital in Taichung

Our colleagues are very touched and appreciative.

Tung's Taichung
Metro Harbor
Hospital

We have received your warm appreciation; the nursing staff really feels the warmth in their heart. Thank you.

Taipei Cathay
General Hospital

We have already shared with the nursing units, we are touched with appreciation.

Cathay General
Hospital Sijhih
Branch

Thank you for your concerns with everything and your words of encouragement. We shared your warm gift with our nursing staff, and also other supporting staff. Because of the devotion of our supporting staff, the nursing staff could focus taking care of the patients. Thank you again!

Kaohsiung E-Da
Hospital

We appreciate Tzu Chi's generosity. Although we only received one patient we still received so many delicious grapes. We have shared with all of those who had helped during this event.

Tainan Chimei
Hospital

Thank you Tzu Chi, we also received grapes with love. We have already shared with all our team members; who are very appreciative of your kindness!

Taipei Wan Fang
Hospital

Wan Fang also received the delicious fruit and shared with all our nursing stations, thank you for t caring.

Miaoli Toufen Wei-
Liong Memorial
Hospital

It is heart-felt warmth!

Changhua Christian
Hospital Lukang
Branch

Thank you! We also received your delicious grapes; we had shared with all the medical teams, the outpatient services, the burn center as well as ICU units. We all felt your loving care. Thank you again!

Taipei's China
Medical University
Hospital

We received your loving care, thank you for your concerns and support, it means a lot to us.

Tzu Chi Hospital in Jakarta, Indonesia

The First for Marrow Stem Cells Transplantation



Photo depicts Indonesia Tzu Chi Foundation holding free clinic for construction workers.

300 guests and volunteers attended the ground-breaking ceremony held outside the Indonesia Jing Si Hall (Photo by: Anand Yahya)

On May 31, 2015, the Tzu Chi Foundation broke ground on its first general hospital outside Taiwan – a 528-bed facility in Jakarta, Indonesia. Built on a site of 2.68 hectares, it will have a main building with 21 storeys covering nearly 99,000 square metres.

It will be the first hospital in Indonesia capable of marrow stem cells transplantation, and will help to alleviate a severe shortage of beds, especially for those on low incomes. The Tzu Chi Hospital will provide services such as: marrow stem cells transplantation, palliative care, neurology, cancer care, health care for women & children, which are unique medical services for a general hospital in Indonesia.

