

DEPARTMENT OF HEALTH, EXECUTIVE YUAN, R.O.C.

Taiwan Health in the **G**+lobe

Vol. 5

Issue 4

December 2009

Improvement of Medical Care and Patient Safety

- ◆ Taiwan Strives for a Safer Hospital Environment
- ◆ Improvement in the Quality of Health Care in Taiwan



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ISSN 1997-5538 GPN 2009701792



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Taiwan



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預防跌倒10知
預防措施做得好，跌倒傷害自然少



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Strives for a Safer HOSPITAL ENVIRONMENT

COVER
Story

Interview with

Dr. Cathy H.Y. Wung, MD, MHA

Chief Executive Officer, Taiwan Joint Commission
on Hospital Accreditation



In

1999, the Institute of Medicine in the US drew worldwide attention to a major medical concern when it published a report on patient safety called "To Err is Human". The report concluded that approximately 44,000 to 98,000 deaths occur in US hospitals each year as a result of medical errors and adverse events such as infections, reactions to medicine, and miscommunication among caregivers. This demonstrated the urgent need for improvement in patient safety and the quality of medical care, and the Taiwan Department of Health (DOH) acted quickly to make improvements. Nevertheless, Taiwan saw its own high-profile medical incidents in 2002, and in response the DOH formed the Patient Safety Committee in early 2003 to develop many programs and campaigns to improve patient safety. At the same time, the DOH began a campaign which included among other projects the drafting of National Patient Safety Goals and the promotion of National Patient Safety Week.

Seeing the opportunity to encourage safer environment and practices, the DOH commissioned the Taiwan Joint Commission on Hospital Accreditation (TJCHA) to implement the recommendations of patient safety. TJCHA, an independent, not-for-profit organization, was established in 1999 with funding from DOH, medical association and hospital associations. Its core businesses include not only hospital accreditation, but also quality related activities and education. Thus, it was fitting for TJCHA to assume the task of promoting patient safety through hospital accreditation, publication, safety guidelines and workshops. Dr. Cathy Wung, Chief Executive Officer of the TJCHA, brings us up to date on the status of the National Patient Safety Goals.

Directed Efforts to Improve Safety in Hospitals

Improve the Safety of Using Medication

Dr. Wung points out that the most common type of errors in Taiwan hospitals is medication errors. Examples of this kind of error include incorrect doses of medicine, incorrect use of medicine due to patient misunderstandings, allergic reactions or other side effects, and other similar situations. It is predicted that by creating standardized procedures for dispensing medicine, collecting correct information from the patient, and providing thorough explanation, the number of incidents can be dramatically reduced. In the case of inquiring about medication history, rather than simply asking the patient to name any known allergies, the health care provider can follow the more specific questions on the checklist to get a more detailed impression of the patient's situation, such as what drugs they are using including herbal medicines and vitamins. In addition, the TJCHA has made many other changes that reduce the likelihood of human error when distributing medicine, such as ensuring that medicine containers bear labels that differ enough in color and design to be distinguishable at a glance by even a rushed pharmacist.

On a similar note, improvements have been made to the prescription of antibiotics. In the past, it was thought that starting a patient on antibiotics one to two days before surgery was an effective safety precaution. However, because it has been found that beginning antibiotics as little as half an hour prior to surgery does not increase the risk of infection — in fact, the risk appears to have slightly decreased — the TJCHA has updated the program to avoid overprescribing them. “Our efforts have significantly reduced the unnecessary use of antibiotics,” adds Dr. Wung.

Reduce Healthcare-associated Infections and Improve Tube / Catheter Management

Reducing the danger of healthcare-associated infections during hospital visits is another National Patient Safety Goal. For patients and visitors, the hospitals now take more steps to encourage proper hygiene. This is accomplished by displaying posters and other reminders of hygienic behavior such as wearing masks or frequently washing hands, ensuring that sinks and soap are always available and organizing activities that promote other healthy habits. Not only do these actions reduce the transmission of communicable illnesses such as Tuberculosis or flu from patient to patient, but they also reduce the chance that a caregiver becomes infected and passes the illness on to other patients. Meanwhile, for health care workers, TJCHA has paid greater attention to safety procedures during the use of tubes and catheters to minimize associated infections. In particular, it was found that a sizeable number of infections and other incidents occurred specifically during the use of nasogastric tubes, endotracheal tubes and Foley's tubes. In some cases the tubes became disconnected, while in others the patients accidentally removed the tubes, or they tried to remove the tubes because of discomfort. Efforts to



First generation

Third generation



Pethidine HCl



Morphine HCl



◀ Package change of look-alike medicine.

be diminished if not eliminated altogether. As part of this revision process, the hospitals have followed the recommendations of the World Health Organization by creating convenient checklists for the surgeons, nurses, anesthesiologists, and all other members of the surgical team. These lists

remedy these occurrences have included changing the design of the tube fittings and connector valves so that each tube can only be connected to its corresponding socket, ensuring that each connection is secure, and educating patients properly about the dangers of tampering with the tubes.

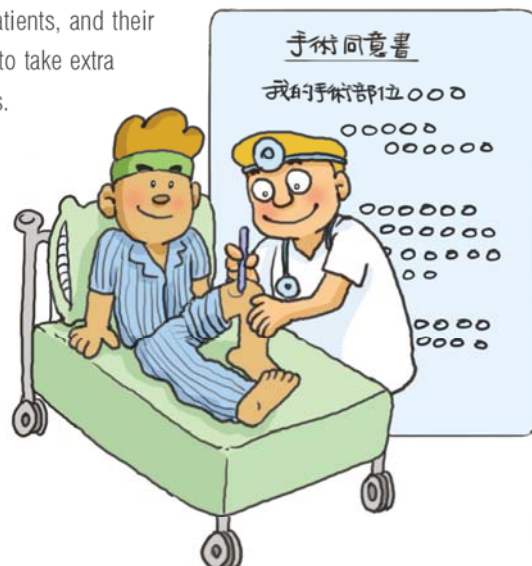
contain pre-surgery procedures and confirmation questions for the patient, so there is much less reliance on the hospital workers to recall every step perfectly from memory. Also, the patient's identity and vital information are verified at each of the multiple steps leading up to the surgery.

Improve Surgical Safety and Prevent Patients from Falling

Errors during surgery may also occur from time to time, and Dr. Wung argues that these kinds of mistakes can happen at even the most reputable hospitals. She offers as an example a case in 2003 at Duke University Medical Center in the US, in which a girl received a heart transplant, and only after the conclusion of the procedure did the doctors realize that there was a mismatch in blood type. "Even one of the most famous, top university hospitals in the world can have this error, and that's why we really have to pay attention to patient safety," adds Dr. Wung. This example reveals one of the more extreme cases of surgical incidents, though there have also been other severe cases in which surgery was performed on the wrong person or wrong side of the body. In addition, there are also less dramatic cases such as those in which pieces of gauze or small devices are left inside the patient's body. These rare incidents can potentially happen anywhere, but through careful revision of the standard operating procedures for surgery, the impact of occasional human error can

Dr. Wung also briefly mentioned that TJCHA has taken steps to reduce the number of falls that occur in hospitals. Though some kinds of falls, perhaps due to slipping or tripping, are difficult to completely eliminate, there are others that result from sleeping pills or drugs with sedative effects, improper use of equipment or wheelchairs, and oversized clothing. Doctors, nurses and pharmacists can reduce instances of the latter by advising patients, and their caregivers to take extra precautions.

▼ Mark the operation site before surgery.



Designing a Better Reporting System and Encouraging Communication

Many of the targets of the National Patient Safety Goals' efforts, such as those already mentioned, are very tangible, involving concrete methods that produce visible results. However, there are many other ways of improving health safety in Taiwan that involve less-visible modifications to the structure of existing health care programs. The aim is to strengthen many aspects of health care, such as teamwork, communication between health care providers, and prompt and accurate reporting of mishaps.

Taiwan Patient-Safety Reporting System (TPR)

Taiwan's National Patient Safety Goals do not rely entirely on referencing the literature or mirroring other countries' regulations; the gathering of domestic data is also crucial in the process of forming new goals. For this reason, Dr. Wung stresses the importance of having an effective reporting system when obtaining data on accidents or near-accidents occurring in the hospital. The Taiwan Patient-Safety Reporting System was thus launched in 2005. Modeled somewhat after the report system used for aviation industry, the system is designed to be non-punitive, confidential and anonymous, as well as to allow for mutual sharing and learning. The idea is to move away from focusing blame on individuals, because as seen in the Duke example major events can potentially occur anywhere and to anyone. Instead, the goal is to examine which steps in the process presented the opportunity for such events to occur and then revise the procedures in such a way that limits the chance of such incidents happening again.

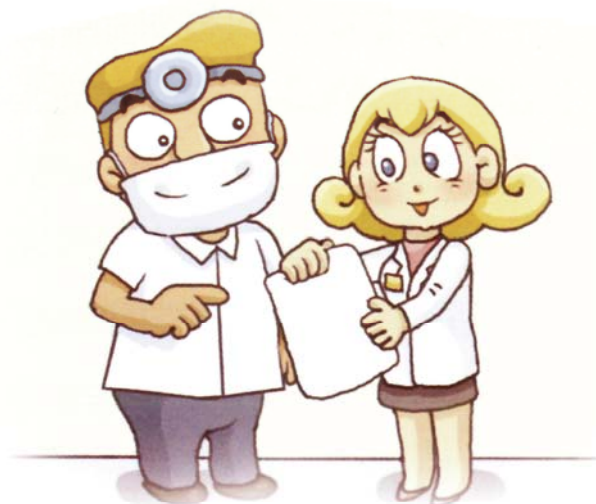
Although the remodeled system has only been active for a few years, the results obtained from the data collection have already brought attention to new issues. With reference to the new discoveries, Dr. Wung provides an example, noting that in the past, "We did not know that there were so many incidents with the endotracheal tube

but from the reporting system we now know that it's a big problem." It is expected that the new reporting system will lead to more of this kind of useful knowledge in the future.

Proper Communication among Hospital Staff

While an extensive reporting system can lead to fewer mistakes down the road, many mistakes can also be avoided when there is a reliable avenue for communication among hospital staff. One kind of problem that may occur due to poor communication is when hospital staff working one shift becomes aware of a special situation with regard to one patient but then fail to make that knowledge available to the workers of the next shift. This may put the patient in danger if the workers proceed to treat the patient without that knowledge, and there is a clear need here for a solution.

Hospital workers must also communicate effectively to fill in the gaps or the gray areas where the responsible party is not always clear. An example in this case, Dr. Wung points out, it might be the proper care of a patient during transfer from the ward to another part of the



▲ Detailed explanation on patients' conditions during hand-over or transportation.

Press conference of Patient Safety Week 2009. ▼



hospital, such as an operation room. If the patient is using an oxygen tank, then all parties need to communicate to ensure that the amount of oxygen provided in the ward will be sufficient to sustain the patient during transfer. Additional considerations such as unusual delays at the elevator need also to be carefully thought through and accounted for.

Reducing Errors through Group Cooperation

Dr. Wung emphasizes that one of the essential underlying elements here is of teamwork. While an individual will naturally make occasional mistakes, a group of people cooperating together is much less likely to do so provided that there is ample communication and each member is aware of what the others should be doing. The TJCHA has begun a teamwork campaign to improve safety in this way. "The physicians are still the leaders," explains Dr. Wung, "but the team cannot depend on only one discipline. It cannot depend on only the doctors, nurses, or pharmacists. Everybody has to work together."

The concept of teamwork can even be extended beyond the hospital staff. Patients and their family members are encouraged to get involved too. Because nurses and physicians have such a limited amount of time to get familiar with patients' conditions, they can benefit greatly from the input of family members who know the patient and can provide crucial details. Meanwhile, patient involvement has been improved by designating a safety reporting

hotline which allows patients themselves to call and report incidents related to hospital safety. There has also been a campaign reminding patients that they should feel welcome to ask health care staff whether they themselves have washed their hands recently. Dr. Wung adds that patients are encouraged to speak up and ask questions so they can be part of the process. "Don't be shy. Don't be embarrassed. If you have a question, just ask," she says. By

working in these and other ways to include patients and their loved ones as part of the team, it gives them the comfort of being able to take an active role in the recovery of the patient, and their input also improves the safety of the environment.

*"Patients
are encouraged to speak up
and ask questions.
Don't be shy.
Don't be embarrassed.
If you have a question,
just ask."*

Dr. Wung

One goal from previous years was absent from the most recent version (2008-2009) of the National Patient Safety Goals: patient identification. The goal was removed because it is of such fundamental importance that it should be taken into account in every field. "It should be a foundation of everything," comments Dr. Wung. In every department and

at every step, the identity of the patient must be certain 100 percent of the time. Hospitals have shown excellent compliance with the regulations involving patient iden-

tification, and it is no longer necessary to treat this as a separate issue, though it will continue to underscore all other goals and programs.

Dr. Wung closes by asserting that although some medical incidents have had dire consequences, the suffering of the victims has brought about great improvements to safety in hospitals. "They did not die in vain," she says. The disastrous case of a man who had the wrong leg amputated later led to the introduction of time-outs, checklists, and other surgical protocols to drastically reduce the chance of such an error occurring again. There was another case of two human research subjects who died as a result of the research in the USA, and this led to a broad reform which implemented much stricter regulations for research on humans. From accidents involving incorrect doses of harmful anti-cancer drugs, new regulations and methods have been devised to carefully monitor the use of these medicines. These are only three examples of the many ways in which terrible accidents have inspired great life-saving changes to medical safety. Through the careful collection of incident reports to the evaluation of the system and the design of safety improvements, the Department of Health and Taiwan Joint Commission on Hospital Accreditation intend to create a safe environment for the patient – an environment in which human errors occur less frequently, and on the rare occasions that they do occur they will in no way endanger the safety of the patient. Together, we strive for safer and better patient care. 😊

2008-2009 National Patient Safety Goals

- Medication safety
- Infection control / Hand hygiene
- Surgery safety
- Fall prevention
- Encourage reporting
- Hand-over and transportation safety
- Partnership with patients
- Tube safety



IMPROVEMENT in the Quality of Health Care in Taiwan

COVER Story

The Chairman of the Taiwan Joint Commission on Hospital Accreditation (TJCHA), Dr. Bor-Shen Hsieh, recently shared his thoughts on how to ensure quality health care both at present and in the future. With the proposition that health care in the 21st Century will be “patient-centered and team-based,” he highlights the direction of health care focus in the near future and describes the changing doctor–patient relationship.

The TJCHA is the first organization in Taiwan that is sponsored by both the government and non-governmental medical groups, and in the ten years since its establishment in 1999, it has worked together with government agencies to perform a range of tasks with the aim of increasing patient safety and effecting improvement in quality of health care. These tasks have included carrying out accreditation of hospitals and implementing the Taiwan Quality Indicator Project (TQIP), the Healthcare Quality Improvement Campaign (HQIC), the Patient Safety Net and the Taiwan Patient-Safety Reporting System (TPR).

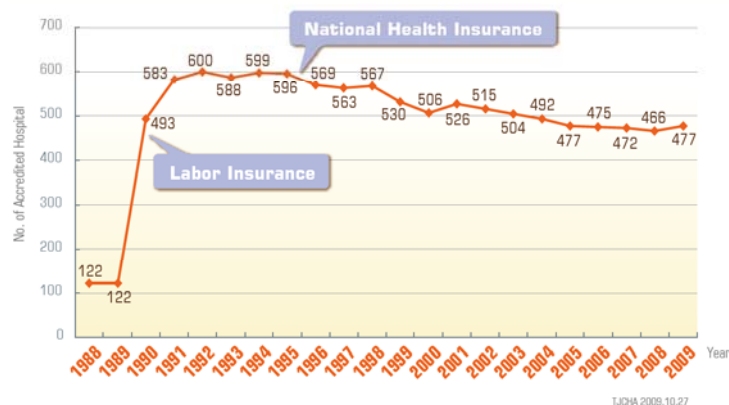
Accreditation of Hospitals

The purpose of hospital accreditation is to increase the quality of health care in hospitals. In Taiwan, accreditation of hospitals began in 1988; however, the first scheme was unsuccessful because it was not mandatory for hospitals to receive accreditation. The level of health care previously differed enormously among domestic hospitals in Taiwan, and it was therefore difficult to evaluate all hospitals using the same standard. Hence, in 1990, three sets of standards with different criteria were used to evaluate different groups of hospitals based on their func-

tions and characteristics. Although the criteria used for the different groups were not the same, the groups were nonetheless required to meet the same standard of quality. To date, since the hospital accreditation scheme went into effect, nearly 500 hospitals in Taiwan have received accreditation, accounting for 95 percent of the total number of hospitals on the island.

Accreditation of hospitals has remained a major task of the TJCHA since its inception. Over the past three

Number of Accredited Hospitals Assessed during 1988~2009



years, the TJCHA has also taken into account the policies promulgated by the Department of Health to revise the evaluation standards and improve the accreditation system. Furthermore, by electing and training professional accredi-

tation surveyors, cooperating with government agencies and participating in international activities, the TJCHA has demonstrated vast experience of hospital accreditation and of its ability to improve the quality of health care. In 2006 and 2007 respectively, the TJCHA passed the on-site survey for Accrediting Organization, and the Accreditation Standards review conducted by the International Society for Quality in Health Care, Inc (ISQua) and was granted IAP certification, becoming the first certified accreditation organization in Asia and the eighth worldwide. These achievements reflect the amount of effort expended by the TJCHA to implement hospital accreditation and improve the quality of health care in Taiwan.

Taiwan Quality Indicator Project (TQIP)

Hospitals and medical institutions in Taiwan also realize the importance of improving the quality of medical care and put much effort into improving their quality of service. In order to assist hospitals in this effort, in 1999, the TJCHA carried out a survey in 112 teaching hospitals using a questionnaire composed of health care quality indicators. The results of the survey showed that 75 percent of hospitals were already undergoing collection of indicator data for health care quality improvement, but that only 33 percent had performed inter-hospital comparative research. Most of the hospitals surveyed reported that major difficulties were encountered when attempting to conduct inter-hospital comparative studies owing to the lack of standardization of indicator definitions and difficulties in accessing data from other hospitals. Therefore, the results suggested that if a third party were able to coordinate the research and provide integrated data, this would assist hospitals in gaining the information necessary for research leading to improvement in the quality of health care.

In 1999, the TJCHA used the Quality Indicator Project (QIP) led by the Maryland Hospital Association in the United States as a model for the development of the Taiwan Quality Indicator Project (TQIP), which was then

implemented in Taiwan hospitals. At the time of this writing, 75 hospitals are participating in this project. As the data obtained for the project are anonymous and therefore more reliable, this can help hospitals work more effectively in making improvements. In addition, the project provides useful references for all hospitals outlining the improvements necessary in clinical practice and hospital management.



▲ TQIP quarterly report.

Healthcare Quality Improvement Campaign (HQIC)

The Healthcare Quality Improvement Campaign (HQIC) was formerly known as the Healthcare Quality Improvement Circle, which was initially held by the TJCHA in 2000. In the 4th Campaign in 2003, the TJCHA introduced the concepts of various approaches for quality improvement. Since then, the activities of the campaign have expanded, widening participation and encompassing more topics, including multidisciplinary (cross-departmental and cross-professional) issues, integrated specialty health care, patient safety, and evidence-based medicine.

For the 9th Campaign in 2008, the name was changed to the Healthcare Quality Improvement Campaign, and this campaign focused on the concepts of "continued improvement, and team work. Throughout campaigning, the TJCHA aims to encourage all medical institutions and hospitals

to actively participate in the effort to improve the quality of health care.



▲ Healthcare Quality Improvement Campaign and poster exhibition.

Patient Safety Net and Taiwan Patient-Safety Reporting System (TPR)

Patient safety has been defined within this program as "the preventive, precautionous and improvement-related measures against any unfavorable results or harm experienced in the health care process. These unfavorable results or harm include errors, hazards and adverse events." In recent years, the issue of patient safety has been one of great concern in countries all over the world. The Department of Health in Taiwan previously invited experts and scholars from hospitals, government entities and academic institutions to discuss this issue and in February 2003 formally set up the Patient Safety Committee. The TJCHA also established the Patient Safety Task Force Team, whose focus was the im-

provement of patient safety. The short-term goals of this team are to educate medical professionals and the public in basic patient safety, while the long-term goals are to build up a shared voluntary reporting system in medical organizations and establish a mechanism by which patient safety can be improved.

Therefore, in 2003 the Department of Health commissioned the TJCHA to initiate planning for the Taiwan Patient-Safety Reporting System (TPR), which was officially launched in 2005. The TPR was designed with five principal attributes in mind: anonymous, voluntary, confidential, non-punitive



◀ Patient education material - fall prevention.

and collaborative. The TPR encourages hospitals and medical personnel to provide any information related to incident events occurring in their hospitals in hope of preventing recurrence of events that could have serious consequences.

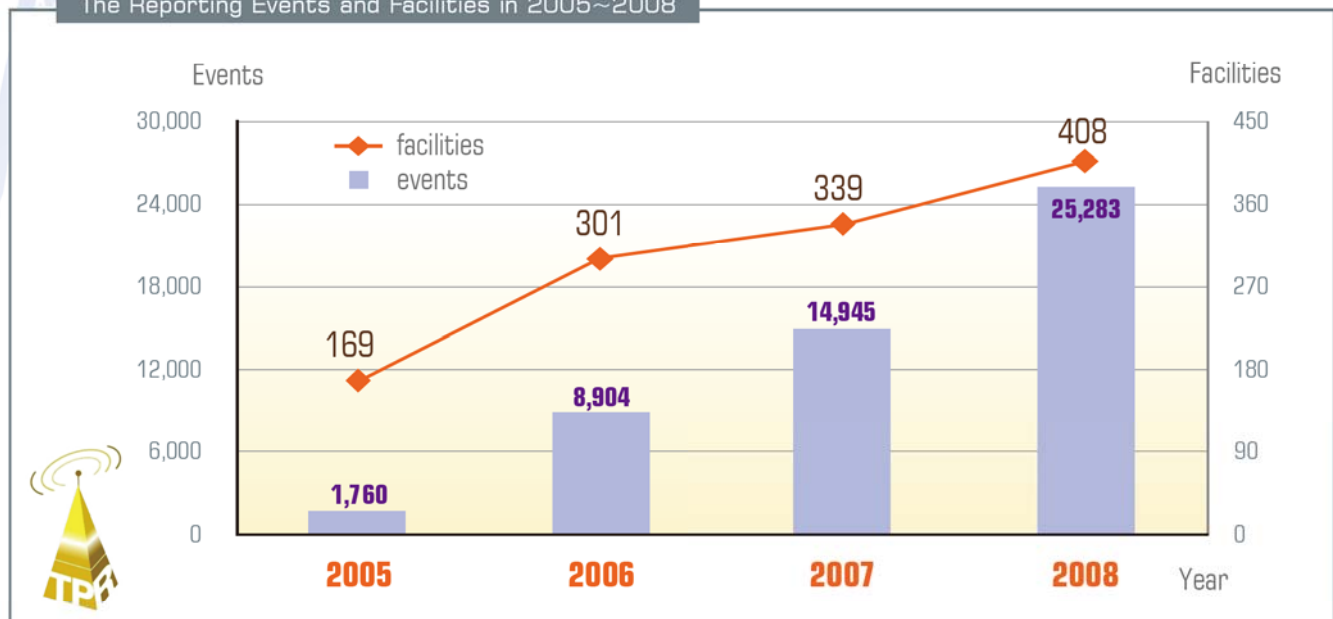
The TPR is also intended to foster a culture

of reporting abnormal events, which through the sharing of experience may reduce the repetition of errors by hospitals and medical personnel. After receiving reported information, TRP staff first deidentify the event then compile the information based on the TPR Event Classification Process, subsequently publishing the data in the Quarterly Report of the Taiwan Patient Safety Reporting System. Educational materials such as alerts, learning cases and relevant knowledge can also be found in the report. The TPR system does not accept any information regarding lawsuits arising from cases of medical malpractice, nor does it allow any malicious libel or falsehood.

Healthcare Quality Improvement Is a Continuous Process

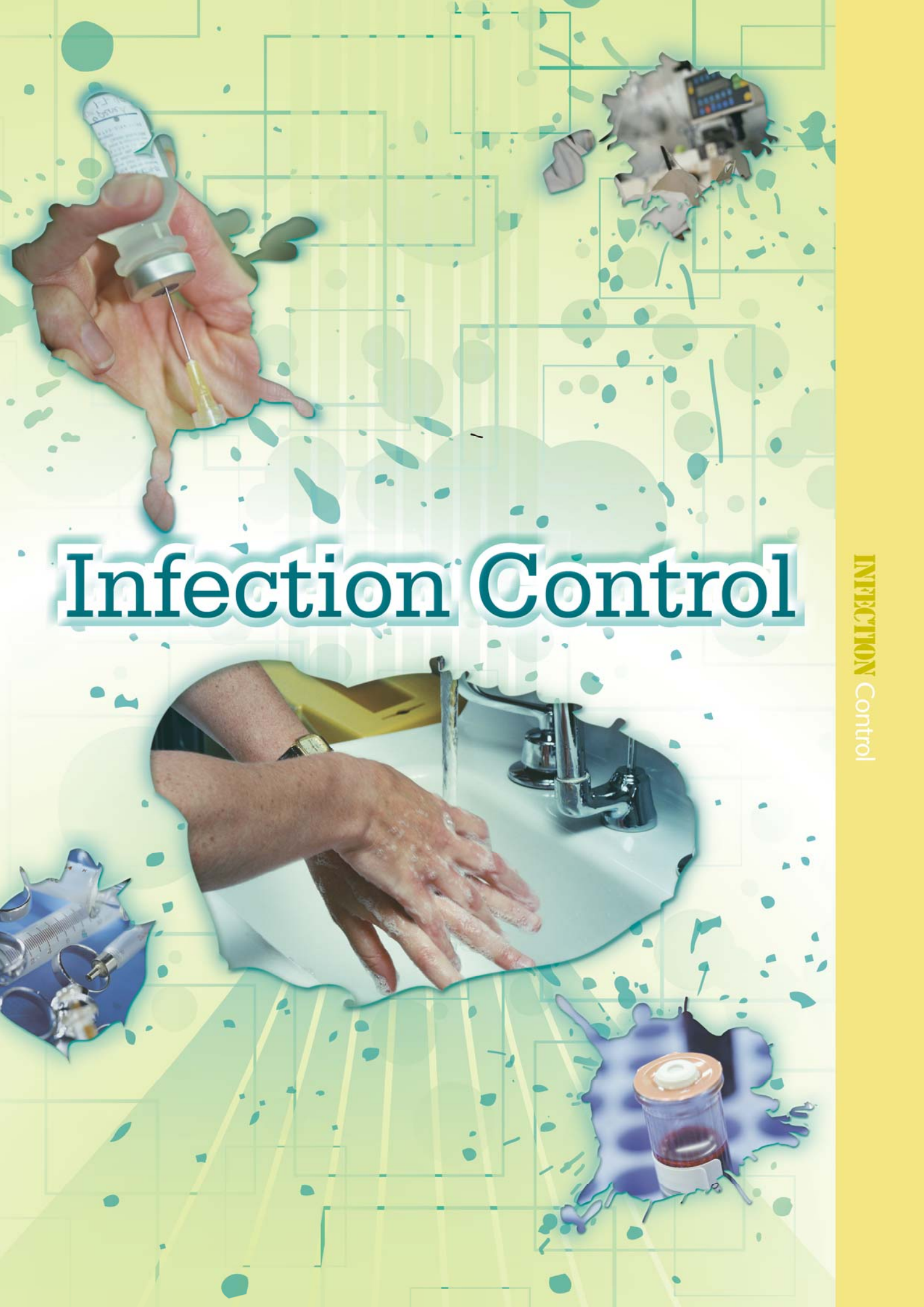
As mentioned above, the effort expended on improving the quality of health care has resulted in significant progress over the past few years in Taiwan. In addition, beginning with education of medical personnel in the concepts of health care quality and patient safety, it is hoped that through cooperation every health care professional will create the safest possible environment for patients. 🌟

The Reporting Events and Facilities in 2005~2008



Infection Control

INFECTION Control



Infection Control Is Inseparable from Patient Safety and Quality Medical Care

The Severe Acute Respiratory Syndrome (SARS) outbreak in 2003 was a recent reminder of the importance of infection control that protects patients and health care workers from healthcare-associated infection. One of the leaders and main proponents of infection control is Professor Shan-Chwen Chang, Deputy Minister of the Department of Health. Professor Chang was the Chief of Infectious Disease Division of the National Taiwan University Hospital in the past, and he has devoted himself to infection control, healthcare-associated infection, antimicrobial resistance and antibiotic usage for many years.

Condition of the Patient Is One of the Risk Factors for Healthcare-associated Infections

Healthcare-associated or nosocomial infections do not necessarily occur as the result of medical staff errors. Even when every precaution is taken, patients are often already in a weakened or vulnerable state due to existing diseases and their treatment. This weakening of the immune system make it especially easy for them to contract infectious diseases. Dr. Chang mentions that nobody wants to have infections secondary to their disease when they are hospitalized. However, infection control measures cannot eliminate infections entirely.

In fact, he estimates that only one-third of infections could be prevented through proper infection control. Two-thirds of infections are because of the weakened immune system of patients. One example is cancer patients who receive chemotherapy to inhibit the reproduction and growth of cancer cells. This treatment not only attacks cancer cells but also bone marrow cells and surface mucous cells that divide quickly. This means the therapeutic effects of chemotherapy would kill these cells and result in adverse effects such as mouth ulcers and



Dr. Shan-Chwen Chang

Deputy Minister, Department of Health

immunodeficiency. In this case, patients have insufficient biological defenses to avoid unwanted infection. Therefore, it is very important to understand that not all infections are caused by medical error, and in fact over half of infections are related to patients' conditions. "Health care providers and workers would

love not to see unnecessary infections, so they do as much as they can to prevent any possible infections. Nevertheless, we hope that the general public bears in mind that the nature of patients' disease and the corresponding treatments may lead to infection," says Dr. Chang.

Inspection of Infection Control Measures

To improve the quality of medical care, infection control is one of the inspection items of the hospi-



tal accreditation system. Since the SARS outbreak, the control of nosocomial infection and the protection of healthcare personnel have become highly significant. The Centers for Disease Control (CDC), therefore, revised the Communicable Disease Control Act and have conducted nosocomial infection control inspections in medical institutions annually since 2005. All of the surveyors are infection control professionals who can find weak spots at each medical institution and assist them in making improvements to patient safety and the quality of medical care.

The hospital accreditation systems and the implemented annual inspection of nosocomial infection control measures in hospitals have made the quality of medical care better and reduced the nosocomial infection rate. However, patient types vary among individual hospitals, and therefore, we cannot judge the overall quality of infection control based on figures from a

single site. Usually, patients with complicated diseases or procedures such as organ transplants are treated in large scale hospitals. Transplant patients are required to receive immunosuppressive agents to prevent the rejection

of transplanted organs and tissues, which result in immunodeficiency and can make them susceptible to infections. Patients with cancer or hospitalized in the intensive care unit are also more susceptible. These patients



▲ Clean your hands! – It is the best and simplest way to prevent nosocomial infection.

with high risks would bring about a higher nosocomial infection rate in the hospital. Dr. Chang comments that the large scale hospitals usually have higher nosocomial infection rates than the small scale or district hospitals. But for the reasons given above, this fact alone does not imply that smaller hospitals have a better quality of medical care than large hospitals. “We really need to see first what kind of patients they are taking care of,” emphasizes Dr. Chang.

Hand Hygiene, Sufficient Facilities and Human Resources

The best and most effective way to improve infection control is to carry out a thorough hand hygiene program. SARS, Influenza A (H1N1) and other communicable diseases are usually transmitted through hand-to-hand contact. Before and after patient contact or invasive examinations or treatment, hand washing can block the chain of infection transmission. Nevertheless, healthcare personnel are usually very busy in their daily work and may not wash their hands as often as is ideal. A convenient and practical way to wash hands can be helpful. For example, if hand washing equipment is only available at each nursing station of the ward, then healthcare workers have to go back and forth between the station and the patient rooms – a task which they might not always have the time to do. Moreover, if they have to wash hands with soap each time before and after patient contact, it takes time and reduces their willingness to wash hands under time constraints. Consequently, hospitals have installed alcohol-based hand rubs at each patient room as well as the entrance of the ward so that the healthcare workers can wash hands without extra time spent.

In addition, hospitals should be equipped with sufficient isolation rooms so that patients with communicable diseases such as tuberculosis can stay there without transmitting pathogens to other patients. Clean and contaminated areas should be separated and clearly marked. Facilities such as operation rooms must be completely cleaned before and after operations. In addition, the allocation of manpower in hospitals is very



▲ Personal protective equipment training.

important, especially with regard to professional infection control physicians and nurses. The infection control unit must be responsible for the surveillance of nosocomial infections of the hospitals. If the incident reports start to increase, infection control professionals may need to conduct an investigation to stop the spread of infectious disease. However, good infection control needs the cooperation of the other departments; every department must be aware of the importance of infection control and follow the rules of sanitation. The infection control professionals are

therefore also responsible for training hospital staff in correct infection control measures. In addition, hospitals should arrange proper human resources based on the number of beds so that preventative measures of infection can be carried out completely. Although it is not easy to ask every hospital worker in every hospital and medical center to follow infection control measures in their daily work as well as during the period of inspection, it is the best way to enhance the overall quality of medical care and ensure patients' safety.

Percentage of Medical Care Institutions Met the Standards of Nosocomial Infection Control

	2005	2006	2007	2008
Number of Hospitals Inspected	522	524	507	495
Number of Hospitals Failed	89	25	20	9
Passing Rate	82.95%	95.23%	96.06%	98.18%

Data source: Centers for Disease Control, Taiwan

Advancements in Infection Control

During the past two decades, Taiwan has made significant progress in infection control and become a leader in Asia. Hospital administrators have been paying much more attention to infection control after the SARS outbreak, upgrading sanitation facilities and increasing manpower for infection control even though this investment increases hospital costs. Meanwhile, each hospital has set up its own infection control team that reviews surveillance reports periodically and takes corrective actions as needed. "When I became a physician twenty years ago, only medical centers had infection control mechanisms," mentions Dr. Chang. Since then, the government has established a hospital accreditation system, implemented the annual inspection program for nosocomial infection control measures in hospitals, and established nosocomial infection sur-

veillance indexes to complete the overall infection control system. Large and small hospitals alike have now set up infection control mechanisms based on national regulations. Also, the Nosocomial Infection Control Society has established an accreditation system to certify qualified infection control personnel and hold training courses for infection control professionals. Dr. Chang concluded that medical school students also have to be well-trained and educated about infection control so they will be well-prepared when they work at hospitals. Meanwhile, educating the general public to wash their hands correctly is a good way to prevent the spread of communicable diseases such as enterovirus, SARS, and Influenza A (H1N1). Only when all citizens join together to prevent pathogen spread from person to person can we enjoy a healthier and safer living environment. ☺

National Taiwan University Hospital - Adequate Infection Control Provides Safer Care

Dr. Yee-Chun Chen

Director, Center for Infection Control,
National Taiwan University Hospital

After the Severe Acute Respiratory Syndrome (SARS) epidemic in 2003, the importance of infection control was reinforced in order to protect patients, visitors and health care workers and prevent healthcare-associated infection. The issue of patient safety has gained more attention in recent years. Not only should the patients themselves raise their awareness on this issue, but the hospital should make more effort in protecting patients' safety, reducing medical errors and safeguarding patients' rights in seeking medical advice.

Since 2004, National Taiwan University Hospital (NTUH) has actively complied with the implementation of infection control and hand hygiene promotion. Dr. Yee-Chun Chen, the Director of the Center for Infection Control, NTUH, shares her experience in carrying out infection control measures and the promotion of the hand hygiene campaign.

Crucial Measures in Implementing Infection Control at NTUH

Dr. Chen had suggested three strategies of infection control at NTUH. First, we must reduce the introduction of communicable diseases into the hospital from the community through patients, their families and visitors. Second, we must prevent cross transmission within the hospital. Third, we must provide a safe and clean environment including allocation of patients if indicated in isolation rooms and monitoring compliance of infection control precautions by the healthcare workers.

To reduce the introduction of communicable diseases from the community, the NTUH has suggested that everyone, including healthcare workers,

patients, their families and visitors, should follow respiratory hygiene and cough etiquette. Dr. Chen advised that visitors experiencing acute respiratory symptoms or fever should suspend visits to hospitals. Patients, patients' families and visitors share the responsibility of cooperating so as to ensure patients' safety.

To prevent cross transmission and healthcare-associated infection within the hospital, hand hygiene is definitely critical. Hands are the most common vehicle to transmit healthcare-associated pathogens. With the annual promotion program of hand hygiene

at NTUH, the hand hygiene compliance rate significantly increased from 60 percent in 2004 to 91.4 percent in 2008.

To control the environmental quality, the first step is to reduce the contamination by human pathogens and multidrug-resistant organisms. Environmental disinfection by cleaners is also important in maintaining high environmental quality. It is expected that the hospital should have higher environmental quality than home settings as the patients are more fragile and vulnerable to infection and pathogens are more concentrated in hospitals. Water sanitation, air quality and hygienic conditions are under continual surveillance.

In the main building and children-woman branch of NTUH, each ward and each intensive care

Hand hygiene campaign posters. ▼▶



unit has one negative pressure isolation room. In the west campus there is also a negative pressure isolation ward for better management regarding visitation policy. In special units, for example the bone marrow transplantation ward, reverse isolation is applied to protect the most vulnerable patient population.

Motivating the Health Care Workers

Dr. Chen commented that education in the hospital and various units is essential in motivating infection control. There are assigned teachers responsible for educating and supervising the health care workers. Infection control is vital in ensuring medical quality and the safety of health care workers and patients.

The equipment renovations include the installation of alcohol-based sanitizer dispensers which

prompted patients, visitors and health care workers to clean their hands more often. The posters at the public area and at the point of care also remind everyone of the importance of infection control and hand hygiene. The infection control professionals monitor health care workers performing hand hygiene. Not only is the staff reminded immediately, but the audit reports are also sent to the department chiefs for reference. The health care workers are encouraged to remind each other to implement hand hygiene.

Infection Control Measures in ICU

The NTUH has followed the international guidelines and protocols to meet the standard of infection control in ICU. The visitors are advised to wash their hands or to use alcohol-based sanitizers and they are provided with gowns and masks when enter-

ing the ICU to prevent introduction of communicable infectious diseases from the community. The health care workers have to strictly follow the hand washing procedures before performing aseptic techniques and invasive procedures.

The Hand Hygiene Campaign

The World Health Organization (WHO) has emphasized the importance of hand hygiene for patient safety and issued the WHO Guidelines on Hand Hygiene in Health Care in 2004, with an update in 2006. The hand hygiene promotion has no facility and budget limits and is supported by evidence-based medicine that hand hygiene can prevent healthcare-associated infection and protect patients' safety. The installation of hand washing facilities is essential. However, the design and placement of ad-

ditional washing basins might be restricted by various reasons. On the other hand, alcohol-based sanitization provides an effective, accessible and convenient way for the health care workers, patients' and visitors' hand hygiene.

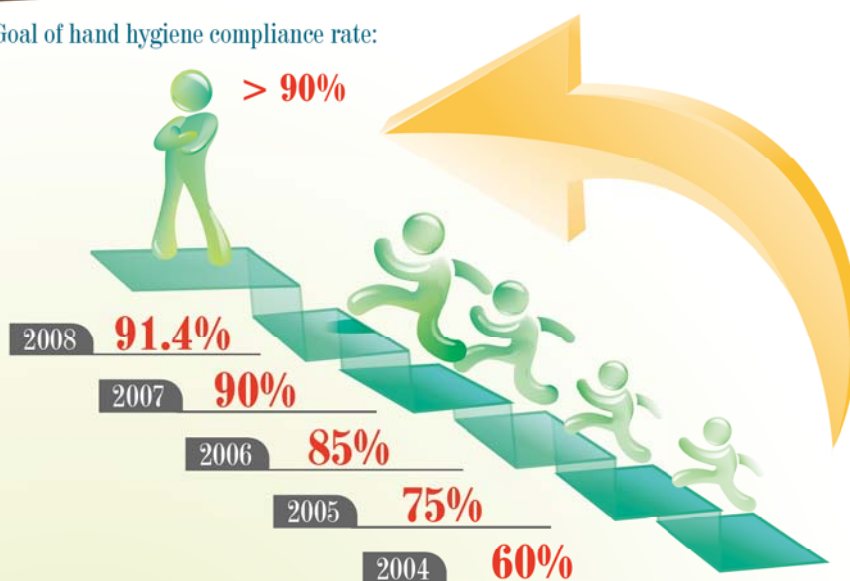
The superintendents of the hospital, chief of the department and physicians act as role models in motivating hand hygiene performance and reforming the current system. Also, through the posters

to educate patients, their family and visitors, they may become involved in the program to remind the health care workers during their busy work to implement proper hand hygiene procedures. The interaction between the visitors and health care workers is encouraged in order to increase the public's knowledge of the correct hand hygiene concepts and work together to protect our patients and also our community.

Achievement of Hand Hygiene Promotion

Goal of hand hygiene compliance rate:

> 90%



Data source: National Taiwan University Hospital

Significant Benefits of Hand Hygiene

The implementation of the hand hygiene program reduces healthcare-associated infections. It is beneficial not only to patients' safety, but also health care workers. Good hand hygiene habit prevents the health care workers from acquisition of pathogens during direct patient care or from contaminated environments. Dr. Chen emphasized that it is important to the health care workers regarding

occupational safety and personal health. During the SARS outbreak, several health care workers were infected despite wearing N95 masks. Compliance of hand hygiene by healthcare workers, patients, their family members, and visitors is the key solution to prevent the passage of pathogens from the hospital to the community. As a result, hand hygiene is a critical foundation to protect the community.

Through the annual promotion program in the previous years, this hospital has developed a hand hygiene culture. Through various activities conducted by the Center for Infection Control of NTUH, health care workers not only are aware but also perform hand hygiene properly.

Infection control is evidence-based, but not limited to knowledge, said Dr. Chen, and requires human behavior modification. Only through implementation of hand hygiene at each opportunity can achieve the goal of patient safety. Through continuous promotion and cooperation from various units and departments, the outcome of the hand hygiene is expected to be excellent.

Infection Control Is Everyone's Responsibility

It is noteworthy that infection control not only relies on health care workers; it also requires cooperation from patients, their family members and visitors. Out-sourcing cleaners are important as well to ensure environmental quality and infection control.

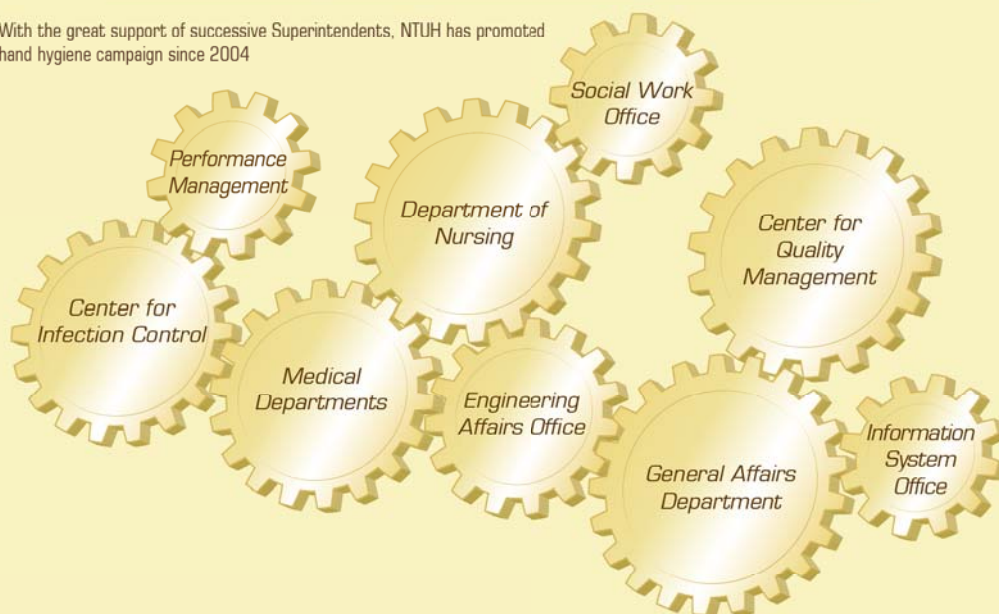
The supervisors' response, concern and support are significant to execute infection control more effectively. Advice from infection control professionals can be adopted and implemented simply. Hardware modification and installation of facilities require financial resources which also involve supervisors' support. Previous experiences suggest that the outcome will be better if the supervisors support infection con-

trol promotion as they will have internal planning and quality control activity.

Dr. Chen stated that the Center for Infection Control has promoted infection control and hand hygiene every year since 2004. Each year the Center reviews and modifies the existing promotion policy and campaign. The Center provides continuous education and new staff training. Consultation from medical and nursing staff in performing hand hygiene can make it more practical in the bedside practice. It requires supervisors' continuous support and health care workers' efforts to make infection control implementation and hand hygiene promotion sustainable. 🌟

Hand Hygiene Campaign All Departments Work Together!

With the great support of successive Superintendents, NTUH has promoted hand hygiene campaign since 2004



Infection Control in Kaohsiung Veterans General Hospital in Southern Taiwan

Introduction of Infection Control in KVGH

Kaohsiung Veterans General Hospital (KVGH) was founded in 1990 and the first Superintendent, Dr. Deh-Lin Cheng, was the first Taiwanese physician in history to receive formal infectious disease training in the United States. KVGH therefore pays careful attention to management of infectious diseases and infection control. The Infection Control Committee is the governing organization in the hospital, and its primary responsibility is managing and executing

policies related to the control of healthcare associated infections, in cooperation with physicians and nurses specializing in infection control. The policies are executed once approved by the committee and generally include planning, promoting, executing, surveying, evaluating and improving infection control measures. Such controls can generally be divided into those applying to patients and those applying to hospital faculty.

The Prevention and Control of Infectious Diseases for Hospital Faculty

The Infectious Diseases Corps in KVGH has pioneered many infection control strategies and has efficiently handled outbreaks in the past years. Our antibiotic control program, especially in optimizing appropriate use of prophylactic antibiotics in surgery, has set the standard for similar programs around the island.

Prevention of Needlestick Injuries

Needlestick injuries are the most common accident known to the healthcare workers and sometimes can cause fulminant hepatitis. We provide examination of antigen and antibody for hepatitis B and provide free vaccination for those who do not

have antibodies. Faculty who experiences needlesticks can be periodically examined for bloodborne



▲ Hand hygiene poster contest.



Dr. Yao-Shen Chen

Chief, Division of Infectious Diseases, Kaohsiung Veterans General Hospital

infectious diseases including HIV, syphilis, and hepatitis B and C. Historical infection records of all faculty members are digitally stored in a hospital database. Hospital members who might be at risk for HIV infection after potential exposure will be treated as emergency cases and will consult with infectious disease physicians immediately. Normally, we finish all diagnosis and post-exposure prophylactic medicine procedures in two hours. All medical expenses are paid by the hospital although no cases of such type of healthcare-associated HIV infection have occurred in our personnel so far.

Promotion of Hand Hygiene

Protecting not only patients but also health-care workers against infectious disease, hand hygiene is of crucial importance for reducing horizontal transmission of potential pathogens in the hospital. We have established a special task team with 160 members who teach a training program to promote hand washing within the hospital. The main duties of this team are to publicize hand hygiene and educate the public about the importance of hand washing. In the last 15 years, several wards, including infectious

diseases wards, isolation wards, wards with higher rates of nosocomial infections and intensive care units, have added hand sanitizer dispensers near the entrance of each room to ensure the feasibility of hand hygiene and prevent the nosocomial infection and transmission of multidrug resistant microorganisms in the hospital. After the SARS (Severe Acute Respiratory Syndrome) epidemic several years ago, we advocated the installation of hand sanitizer dispensers in all remaining wards that did not already have them.

We have established the necessary facilities and approached the hospital committee for support. Compared to clinics, medical centers are difficult to upgrade; therefore, we have designed a computer program allowing medical workers to easily collect the infection history of all personnel. Medical workers are not the only targeted group; we hope patients and their relatives all understand the importance of hand washing. By establishing a set of standard operation procedures, we hope eventually all the medical workers in Taiwan can adopt frequent hand washing as a habit.

The Prevention and Control of Nosocomial Infections for Patients

For patient's safety and in order to help prevent patients from getting nosocomial infection, we systemically survey and analyze the occurrence of

hospital-wide nosocomial infections, and efficiently control outbreaks and reduce the spreading of multi-drug resistant bacteria in the hospital. This informa-

tion gives us a clue whether or not there could be a cluster of infections in the hospital. If that is the case, we will collect information and deliver warnings to every department in the hospital to closely monitor the situation. Once the source of the problem is discovered, we will investigate it carefully and respond until the sanitation is improved.

Sanitation of Water and Environment

To protect patients from infection, environmental sanitation is the most important issue and we periodically test the water used in the pharmacies, dialysis rooms, endoscopy rooms and restaurants. Moreover, we examine the sterility of all medical devices prior to their use in operation or invasive procedures to ensure the safety of all the devices. To response to a previous cluster of Legionnaires' disease in our hospital, we set up the first copper-silver ionization water disinfecting system in Asia to control *Legionella* in 2004. The occurrences of *Legionella* in the water distribution system in general were reduced from 30 percent to 10 percent. In the long term, the occurrence of *Legionella* colonization can be steadily maintained below

30 percent and reduce the risk for acquisition of nosocomial Legionnaires' disease.

Construction of Contact Isolation Wards and Negative Pressure Isolation Wards

Furthermore, in order to improve caretaking for patients who are infected by drug-resistant bacteria, we built contact isolation wards for carbapenem-resistant *Acinetobacter baumannii* (CR-AB) and vancomycin-resistant *Enterococci* (VRE). All medical workers who need to go into these wards have to wear personal protective equipment (PPE) to prevent transmission of bacteria. We had only five negative pressure isolation rooms in 1996 but we now have 21 rooms in a special ward that is set apart from the other wards. The area is secured and all the staffing are highly experienced. Its outstanding performance during the SARS epidemic has been widely appreciated and recognized along with the team that was able to provide quality medical care to SARS patients while successfully avoiding nosocomial infections within the hospital several years ago.

Negative Pressure Isolation Wards





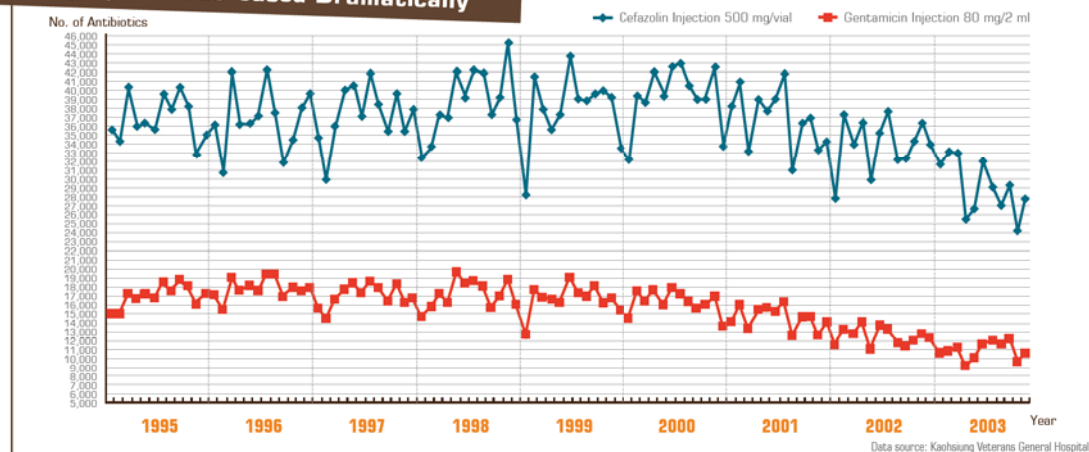
◀ Drug-resistant bacteria isolation ward.

Restriction of Antibiotics Abuse

In 2000, we initiated a program in optimizing appropriate use of prophylactic antibiotics in surgery granted by the National Health Research Institute (NHRI) in Taiwan. We had made a great progress by applying cost-effective strategies to optimize the use of prophylactic antibiotics in surgery by reducing 65 percent of

antibiotic expenditure in surgical prophylaxis, or 20 percent in total cost of antibiotics in the hospital. We initially provided our clinical data on the excessive use and often inappropriate timing of administration of antibiotics for surgical prophylaxis in a representative medical facility in Taiwan and later shared our successful experience to NHRI and Centers for Disease Control (CDC), Taiwan, as a recommendation for improvement of the health policy. The CDC and the Bureau of National Health Insurance (BNHI) then established a standard guideline for the use of prophylactic antibiotics in surgery in reimbursement of national health insurance. The optimization of using prophylactic antibiotics in surgery not only reduces medical expenses but also lowers the occurrence of drug resistance and improves and assures the quality of medical care.

The Use of Prophylactic Antibiotics for Surgery Has Decreased Dramatically



Dedicated Commitment and Contribution to Public Health

The KVGH Infectious Diseases Corps provides expertise in comprehensive medical care for infectious diseases, superior quality microbiologic diagnosis, outstanding infection control and prevention programs and strategies along with dedicated commitment and contributions to education, research and public health concerns. The advanced microbiologic laboratory is constantly updated to provide accurate microbiologic diagnosis, and an anonymous HIV/AIDS screening

program has been actively promoted to address public health concerns. The team has diagnosed many of the foremost and unusual infectious diseases in Taiwan and has published most of these cases in the literature. In the long term, we are going to establish a medical center for AIDS prevention and treatment. Besides medical service, we have social workers and organizations and we strive to provide patients with the best health care in southern Taiwan. ☺



Empowering Taiwanese Citizens with Correct Medication Knowledge through EDUCATION

Ms. Li-Ling Liu

Deputy Director-General,
Bureau of Pharmaceutical Affairs,
Department of Health



Li-Ling Liu is the current Deputy Director-General of the Bureau of Pharmaceutical Affairs. During a recent interview, she shares her insight of the recent actions taken by the Department of Health (DOH) together with other collaborating institutions to educate the citizens of Taiwan in correct medication knowledge.

“Medication safety is intimately related to the lives of all citizens,” Ms. Liu began. In addition to assuring the quality of medicines produced by manufacturers, it is also essential for the DOH to monitor the distribution of medicine to medical institutions and pharmacies. Without proper management, it is very easy for unapproved and illicit drugs to find opportunities to infiltrate the system. To prevent that, the Good Supply Practice and Good Pharmacy Practice are implementing in order to guarantee that patients will receive the best possible medicine.

Another aspect of medication safety is the patients’ correct knowledge of medication. In Taiwan, there is a large percentage of senior citizens who trust underground radio stations to recommend to them which medicines to use. This reflects the demand and need for medicine among senior citizens, but unfortunately it also shows their insufficient medication knowledge. With correct medication knowledge, a consumer would be better suited to examine the legitimacy of medicines and avoid those which are illicit.



Correct Medical Knowledge within Everyone’s Reach

In recent years, Ms. Liu mentions, the DOH has prioritized the promotion of correct medication knowledge using channels such as television or printed media to reach the general population. However, this approach does not facilitate bilateral communication between public and the government, and the DOH has therefore worked to find new approaches to this initiative.

Starting from 2008, the Medication Education Resource Centers project has allocated resource centers in four regions of Taiwan. Each resource center has the sole purpose of providing correct medication information to the public and promoting education about medication in schools and communities. Any private or public group willing to hold medication education courses can contact these resource centers for assistance. To this date, the resource centers have held 136 educational courses with more than 20,000

participants in total. This feat was made possible by the joint effort of more than 500 volunteers specialized in the promotion of correct medication knowledge, 900 pharmacists, and 200 medical personnel. The Medication Education Resource Centers are available to the public for inquiries into health issues throughout the day, and the public can reach them through free-of-charge phone calls or by going directly to their locations.



▲ Promoting correct medication concepts.

Devoting Attention to Medication,

In a public survey conducted by the resource centers, it was shown that the majority of people does not understand well and even misunderstands fundamental pharmaceutical terms. In an attempt to elevate the quality of medical knowledge in the general public, the DOH has established the five essential factors of correct medication: expressing clearly one's physical condition while visiting the doctor; examining carefully the medication label; understanding medication administration time and methods; becoming master of one's body and refusing medication from illegal sources; and building a trusting relationship with one's pharmacist.

The resource centers create educational material that is tailored to accommodate the idio-

▼ Opening Ceremony of the Northern Medication Education Resource Center.



synchronies of the target areas, and they establish collaborative relationships with local community healthcare groups. Accomplishing that, doctors, pharmacists, and nurses will be able to provide correct medication knowledge while attending to patients, thus adding correct medication education to the normal routine.



Growing Up with Correct Medication Notions

Ms. Liu also introduced the Correct Medication Education on School Campuses project, which began earlier this year. This initiative aims to equip students with medication knowledge before they graduate. To date, eight schools have applied to be central schools in medication education. The central schools have already established partnerships with 40 schools across the country.

The Correct Medication Education on School Campuses project and the Medication Education

Resource Centers project are closely related, and in many ways they complement each other. The former project relies on educational materials from resource centers, while the central schools expand and promote correct medication education to other schools in nearby areas. Many elementary schools across Taiwan have already become part of the Correct Medication Education in School Campus project, inviting pharmacists and specialized teachers from Medication Education Resource Centers to assist in health education courses, while at the same time tailoring these courses according to the health issues that particularly affect the school or the area in general.

All these projects aim to make correct

Medication Consulting. ▼



Improving Health Condition

medication knowledge both universal and localized, so that relevant healthcare information is available to every person across Taiwan in an accessible and bilateral way.

"These projects are very recent, and currently the budget is limited. In the future, the DOH will further expand the reach of correct medication knowledge, prioritizing on demographic groups that are most likely to be affected by insufficient medication knowledge, such as the elderly population in central and southern regions of Taiwan, and the women who are frequently in contact with children" commented Ms. Liu.

Another important issue is the education of children. Health education is undervalued in Taiwan's present education system, causing the younger generation to underestimate the importance of healthcare. As a direct consequence, students put all their efforts preparing for the subjects of Basic Competence Test, among which are Chinese literature, mathematics, and natural science. On the other hand, health education, not being part of the Basic Competence Test, is simply ignored by the students. Therefore, Ms. Liu commented, the ideal scenario is for the DOH and the Ministry of Education to collaborate toward educational reform, transforming health education into a more relevant subject in the education of younger generations, while updating the contents of health education courses to elevate the correct medication knowledge of the students.

Ms.

Liu concluded by saying that it is in the DOH's plan to provide an environment of medication safety, and seek international collaborations and partnerships in the near future, in hopes that these efforts will protect the public from illicit medication, while simultaneously providing the public with sufficient medication knowledge to be able to make better judgments by themselves.



CORRECT MEDICATION The Five Essential Factors

- 1 Expressing clearly one's physical condition while visiting the doctor
- 2 Examining carefully the medication label
- 3 Understanding medication administration time and methods
- 4 Becoming master of one's body and refusing medication from illegal sources
- 5 Building a trusting relationship with one's pharmacist

DEPARTMENT OF HEALTH, EXECUTIVE YUAN, R.O.C.

Taiwan Health in the Globe



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ISSN 1997-5538



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GPN: 2009701792

Price: NT\$100