

## **Singapore: Alexandra Health Cluster**

Healthy eating is promoted throughout the hospital – from wards to eateries. Fresh fruits and vegetables are harvested from hospital's gardens and served to patients in the wards. In the food court, food stalls and café serve healthy yet delicious food, prepared with less oil, salt and sugar. To further encourage healthy eating, the food is not only healthier, but also cost less than restaurant food.



Alexandra Health Cluster- Hospital's gardens

## **Waste**

The definition of waste by the World Health Organization is the waste from health care facilities that includes the waste produced during diagnosis, treatment, prevention, rehabilitation and related research. The international survey shows that the health care facilities are the major producer of biomedical waste, which constitutes 10-15% of total hospital waste. According to the 2007 data from the Department of Health of Taiwan, there are a total of 19,900 hospitals and clinics in Taiwan, and the statistics from the Environmental Protection Administration indicates that there are 90,000 tons of wastes generated each year, with 23,561 tons of biomedical waste included. The statistics also shows hospitals produce an average 64.5 tons of medical waste every day<sup>15</sup>. How to deal with huge biomedical waste in hospital is something the hospital administrators must take seriously.

## **Taiwan: Changhua Christian Hospital**

Changhua Christian Hospital applied Automatic Identification and Data Capture (AIDC) system in managing their biomedical waste. For the waste recycling, they began making an effort in the management of biomedical waste, reusing infectious waste to fully implement waste

recycling. In October 2009, the plans used reusable biomedical waste such as vacant syringes, artificial kidney, and the tube of IV set. According to the 2009 data, hospitals produced 32 tons of biomedical waste per month, and after the commencement of the project in March 2010, biomedical waste was reduced by 5 tons per month. In the hospital, around 20%~30% of the used vacant syringes, artificial kidney, and the tube of IV set could be reused. Compared with the cleaning fee of traditional biomedical waste and the reclamation waste, it could save about NT\$ 35,000 per month and NT\$ 420,000 per year.

For example, they recycle the bottles to be reused in the nursing department, and the hemodialysis cans are provided to the recycling company. Recycled advertisement flyers are reused. Both sides of every sheet of paper are used. E-system is used instead of paper. These actions would reduce both hospital cost and the consumption of paper.

Changhua Christian Hospital insisted on adopting green consumption and reusable materials. As a health care facility, they purchase goods and equipment with the green label only, and adopt

environmental promotion to decrease the need of redundant purchases and optimize the information management system to decrease and prevent pollution.

The Picture Archiving and Communication System (PACS) is used in the hospital, making viewing examination reports anywhere possible in the hospital; thus increasing efficiency and reducing the need of space and manpower. Films are displayed on screens, and physicians do not need to use the traditional X-ray photograph, reducing the use of photographic paper, developing agents and fixer solutions. As a result the hospital would produce less water waste and cause less harm to the environment. Moreover, the hospital specified the regulations on deserted property management and disclosed them on the website, and furthermore, they transferred the goods to the departments that need them and held auctions sales which will extend the usage and reduce wastage.

### **Taiwan: Buddhist Dalin Tzu Chi General Hospital**

In health care facilities, the management of medical waste is one of the most important tasks. We use modern information technology to develop electronic health care information as part of our effort

in becoming a paper- and film-free hospital. Through e-administration system and health care information system, the hospital saves NT\$ 21.5 million per year.

Quality Control Circle (QCC) programs for reducing the medical waste successfully cut down on the amount of waste production from 2.92kg/bed to 2.59kg/bed per day. In the hemodialysis room, the equipment is designed to successfully decrease the artificial kidney fluid from 0.9 kg to 0.8 kg per bed.



Buddhist Dalin Tzu Chi General Hospital- Recycling work in each nursing station. There are 9 categories recycling bins: metal, paper, plastic, soft bag, biomedical waste, glass, aluminum, PET bottle and garbage.

The recycling work is also the important strategy in hospital. In each nursing station, there are more than nine categories of recycling bins. And in the hospital compound, hospital staff and families will volunteer and gather in the recycling station to recycle the goods from hospital and local communities.

Over the past three years, the general waste has decreased from 2.05kg to 1.92 kg per bed per month and the recycled was increased goods by 87,991 kg.

By not providing disposable utensils and mandating the use of reusable items whenever possible, the use of disposable chopsticks has decreased by more than 3 million pairs in 7 years.



Buddhist Dalin Tzu Chi General Hospital- Reusable utensils only in the hospital.

### **Taiwan: Taipei Medical University- Shuang Ho Hospital**

The waste management is one of the important environmental safety management systems in Shuang Ho Hospital. For waste sorting, reduction and recycling, the hospital adopted several measures: set up a waste treatment plant for biomedical waste area, general waste and recycling area;

reduction from source of waste, processing and reduce final waste in the recycling process.

1. Reduction from source of waste: for environmental protection, paper cups are no longer provided in the meetings, greywater is used to wash toilets and irrigation, and all departments should reduce the medical waste from the source.
2. Processing: posters of different waste recycling categories in each department to teach staff how to discard the waste in the correct bin.
3. Reducing final waste: The delegated staff manages all waste and performs secondary recycling to reduce unnecessary waste and increase the amount of reusable goods (such as paper, iron, aluminum, plastic bottle and glass).

Leftover waste gets incinerated, and recycled goods are cleaned and delivered to recycling stations by the professional wastage company who is specialized in, for example, melting the recycled glasses with coal ash or other materials to become reusable bricks.



Shuang Ho Hospital- The general waste handling area and biomedical waste storage area.

### **Taiwan: Chiayi Christian Hospital**

The hemodialysis room is one of the departments in the hospital that produces more biomedical waste than others. The major waste is the artificial kidney and catheter. They remove the wastewater remaining in the artificial kidney and circuits by dialysis machine blood pump, to lighten the weight of biomedical waste. Similarly, in order to simplify nurses' workload and prevent nosocomial infection from happening, the hospital designed a simple infectious wastewater recycling connector to discharge the infectious

wastewater to the polluted water treatment plant. After reducing these biomedical wastes, the hospital can save cost on hiring people and expenses on dealing with the biomedical waste, increasing the empty bin recycling by NT\$ 180,000.

### **Taiwan: Chang Gung Memorial Hospital**

Compared to year 2008, the recycling program yielded significant results in the year 2009. A total 642 tons of garbage were reduced, decreasing carbon dioxide emission by 578 tons, compared with the previous year. They continue to promote e-administration system and paperless system. For example, the employment of digital signature in medical information system can save 32 tons of paper, 3,514kW.h of electricity, NT\$10.527 million, 48 tons of carbon dioxide emission and 184.8 m<sup>2</sup> of space for storing admission notes.

### **Singapore: Alexandra Health Cluster**

‘Refuse, reduce and reuse’ is one of the philosophies that Alexandra Health Cluster hospitals live by. To encourage everyone from staff to visitors to patients alike to help in a joint effort in reducing waste, the following initiatives have been implemented:

- Plastic bags are only provided upon request. Clean, recycled plastic bags are provided free of charge, but new plastic bags are chargeable.
- Recycling stations are placed conveniently throughout the hospital.
- Cornware is used instead of plastic where disposable cutlery is required.



Alexandra Health Cluster- Bio-degradable cornware utensils and recycling bins placed around the hospital