

Paropakar Maternity and Women's Hospital Waste Management

GGHH Agenda Goals

- Leadership
- Waste
- Energy

Hospital Waste Goals

- A leader in managing waste safely and sustainably using non-burn technology
- A leader in generating energy from organic & pathological and food waste



Now we are giving utmost priority to the safety of the patients. We segregate the waste into hazardous and non-hazardous categories, and sterilize the hazardous waste."

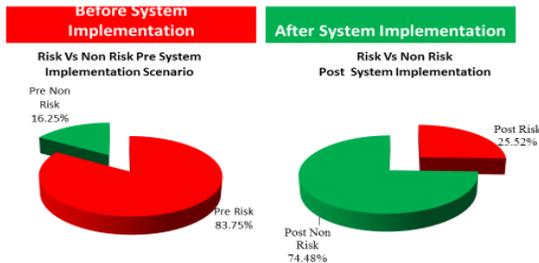
~ Dr. Jageshwor Gautam, Director, Paropakar Maternity and Women's Hospital

(Source: <http://admin.myrepublica.com/feature-article/story/36154/maternity-hospital-making-money-from-hazardous-waste.html>)

Progress Achieved

- Certified as a member of the Global Green Healthy Hospitals Network in 2015.
- Implementation of safe health care waste management system completed in all the wards—with a governance structure and system in place for safe waste segregation, transportation, treatment and recycling.
- Fully functional Waste Treatment and Storage Center established with a validated pre-vacuum autoclave in place—a recommended non-burn technology for treating infectious waste.
- Practices safe injection and safe handling of sharps with the use of needle destroyers and needle cutters in all the wards.
- Risk waste has been reduced from 84% to 25%

Risk Vs Non Risk



- Currently, 39% of its waste is recycled, generating about NPR 19,000 (USD 178) per month. (Types of waste recycled: Paper - 59%, Plastic - 34%, Glass - 4%, Rubber - 3%)
- Pioneering two-stage biodigestion plant to dispose of placenta (pathological waste), and food leftovers (organic waste), and also generate methane as a renewable fuel.
- Research in vermicomposting of sanitary pads.

I volunteered to be a waste coordinator in this ward because I think it is important for the hospital. I have been working here seven years and I am very impressed with how the health care waste management system has transformed the hospital. It is much cleaner and safer now."

~ Shrijana Bhattarai, Ward Waste Coordinator

The Issues

- Communities living near the hospitals complained about the burning of medical waste, exposing them to toxic pollutants such as dioxins and furans that have adverse impacts on their health and the environment.
- Disposal of hazardous medical waste through the municipal system without disinfecting it was a threat to the waste handlers and municipal staff.
- With 16,000 babies born a year at the hospital, disposal of placenta was a major issue. The hospital disposed the placenta in an open pit, which puts people and the environment at risk.
- There was no system for waste management. Nurses and other hospital staff were responsible for disposing waste, which was done in a haphazard manner, exposing them to risks of infection and injury.

Sustainability Strategy

- Behavioral and attitude change is the most critical for ensuring sustainability of the health care waste management system.
- To bring about this change, all the hospital staff members received orientation and training, and they were involved in each and every step of the system implementation process.
- The system was designed and developed based on a diagnostic assessment conducted at the very beginning, and on feedback from staff.
- As recommended by WHO, a hospital waste coordinator has been appointed and a waste management committee has been established, chaired by the director of the hospital, to oversee the health care waste management system at the hospital.
- The committee deals with all the issues and decisions related to waste management, and ensures that all new staff receive training on the waste management system, on segregating waste at source, and on injection safety and safe handling of sharps.

Implementation Process

Following a diagnostic assessment, a safe and sustainable health care waste management system was designed and implemented for the Paropakar Maternity and Women's Hospital (PMWH).

Technical assistance was provided by Health Care Foundation Nepal (HECAF), including orientation, training and advisory support.

The design and implementation process was coordinated by the PMWH waste coordinator and waste management committee. It involved all PMWH staff to ensure ownership of the waste management system.

PMWH focused in particular on behavioral changes in segregation practices, waste transportation, waste treatment and waste storage.

Segregation Practice



Previously, only 5% of the waste bins were labeled, and they were not standardized.

Two new features have been introduced in each ward:

1. A general waste collection area for PMWH staff and visitors with standardized, color-coded and clearly labeled bins for different sorts of waste—biodegradable, paper, plastic, and bottles and cans.
2. A tailored medication trolley designed for segregation of waste at source, which include separate bins for infectious waste and a needle cutter.

Waste transportation



Dedicated waste handlers at the PMWH have been appointed, trained, vaccinated and given personal protective equipment. Daily, they transport waste from the hospital buildings to the Waste Treatment and Storage Center on a fixed route and at a fixed time.

Waste collection center





Infectious waste and sharps are treated in the autoclave, and non-risk waste stored for recycling.

PMWH disposes on average 900 syringes per day. Previously these syringes were burned in the open, releasing toxic pollutants. Now the disinfected syringes are recycled and generate income for PMWH.

As this is a maternity and women's hospital, special attention is given to the disposal of placenta and sanitary pads, which are generated in large volumes on a daily basis.

Working together with HECAF, Health Care Without Harm and a biodigester design expert, PMWH is installing a pioneering biodigester to treat placenta/pathological waste and food/organic waste. As a bonus, the digester generates methane, which can be used as a renewable fuel.

The biodigester has two chambers to ensure that the placenta has as long as possible to break down. Treated waste overflows into the sewer with no extra handling and no power needed.

Biodigestion Plant for Placenta and Food Waste



Biodigestion Plant for Placenta and Food Waste Technical Details –

Volume Size of First Stage Digester: 15 m³

Feeding Material: Placenta only (Pathological Waste)

Maximum Input: 65kg of placenta per day (currently, PMWH disposes 40kg of placenta per day)

Volume Size of Second Stage Digester: 20 m³

Feeding Material: Food leftover only (Organic Waste)

Maximum Input: 80kg of food waste per day

Estimation of total gas output: 12 m³ per day

Usage: The biogas generated will be used in the hospital kitchen

Vermicomposting of Sanitary Pads



The earthworms convert some of the autoclaved sanitary pads into compost that is used for non-food gardening in the hospital grounds.

Lessons Learned

- Design the health care waste management system based on a diagnostic assessment that should be conducted at the start. The diagnostic assessment: (1) Measures the amount and composition of waste generated to determine the specifications and cost of the waste management facility and equipment; (2) Observes the existing waste management practices; and (3) Recommends a feasible waste management system for the hospital that is safe and environmentally sound.
- Begin implementation of the health care waste management system in one ward first. This becomes the model ward that is replicated hospital-wide. This has proven to be an effective implementation strategy.
- Involve all staff in designing and implementing the waste management system to ensure its success, ownership and sustainability. This includes the involvement of not only nurses, doctors and housekeeping staff, but also administration and finance, and security.

Next Steps

Reports on the design and operation of the biodigestion plant will be published.

About PMWH and HECAF

The hospital located in Thapathali, Kathmandu provides services in the areas of obstetrics, gynecology and neo-natal care to about 125,000 women and children annually. The hospital has 415 beds and over 16,000 babies are born at the hospital each year.

At the request of PMWH, Health Care Foundation Nepal (HECAF) started implementing a health care waste management system at PMWH in July 2012.

HECAF, established in 1994, is a national non-governmental and not-for-profit organization with a mandate to work in three core areas: (1) health care, (2) environmental health and (3) emergency health. HECAF established the National Kidney Center in 1997, offers technical support in developing a safe and sustainable health care waste management system, and provides capacity development and training in emergency management and disaster risk reduction.

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