Bir Hospital: A Model Hospital for Safe and Environmentally Friendly Health Care Waste Management System in Nepal

GGHH Agenda Goal

- Leadership
- Waste

Hospital Goal

- To promote safe and sustainable environmental health in health care facilities in Nepal through adoption of autoclave-based safe health care waste management system

Progress Achieved

Bir Hospital is Nepal's oldest hospital. Located at the heart of Kathmandu, it is also one of Nepal's busiest hospitals. In 2010, Bir Hospital decided to make environmental health and safety its priority and reduce its climate footprint. Today, Bir Hospital is a leader and a model green and healthy hospital in Nepal. It is the first government hospital to become a member of GGHH.

In demonstrating its leadership, Bir Hospital focuses on three other goals of the GGHH Agenda—Chemicals, Waste and Energy:

Chemicals – Bir Hospital is one of the first mercury-free hospitals in Nepal, along with the National Kidney Center, another GGHH member. At Bir Hospital, mercury containing thermometers, blood pressure devices and dental amalgams have been replaced with safe, accurate and affordable alternatives. Bir Hospital has a Mercury Collection House in which mercury-containing devices are safely stored. The mercury-free practices at both the Bir Hospital and the National Kidney Center helped convince the Ministry of Health and Population in Nepal to stop the purchase of mercury-containing medical devices for the government hospital system.

Waste – Through the establishment of a safe and environmentally sound health care waste management system, Bir Hospital has reduced its medical waste by half. It is now recycling 53% of all the waste it produces, earning about USD4,400 per year from recyclable waste. By segregating waste at source, it has reduced its infectious waste by a third. The infectious waste is disinfected using steam-based autoclave technology that has been validated by experts. Bir Hospital also promotes safe injection and safe handling of sharps through awareness raising, and the use of needle destroyers and needle cutters.

Additionally, Bir Hospital has pioneered new methods to further reduce waste through vermicomposting to dispose of autoclaved cotton and gauze that are non-recyclable. The earthworms convert these cotton and gauze into compost that is used for non-food

gardening in the hospital grounds. Bir Hospital has also built the nation's first biodigestion plant for biodegradable waste. 30% of the hospital waste goes into the biodigestion plant.

Energy – A 25 cubic meter biodigestion plant was constructed that uses an anaerobic digestion process to produce biogas for cooking in the hospital kitchen. The biodigestion plant is capable of processing 150 kg of biodegradable waste per day, but the hospital inputs about 75kg of biodegradable waste a day (mostly food waste), which generates about 7 cubic meters of biogas per day. Results from a research study on this biodigestion plant was published in the Nepal Journal of Science and Technology in 2015.[1]

Subsequently, a two-stage biodigestion plant has been designed for the Paropakar Maternity and Women's Hospital to process pathological (placenta) waste, as well as food waste. Research is underway making Nepal a pioneer in this area.

Leadership: As a leader in environmental health, Bir Hospital has actively promoted these initiatives mentioned above, and their benefits, and encouraged health care professionals to visit and learn from its health care waste management facilities. By the end of August 2014 the hospital had recorded more than 2,000 visitors, including governmental officials, staff from Nepali hospitals, delegates from aid agencies and the World Health Organization (WHO), students studying public health and medicine, and ministries of health from at least ten other countries. Bir Hospital's active awareness raising has influenced many hospitals—both public and private—to establish a health care waste management system, with Bir Hospital as its model (see quotes below).

Bir Hospital is mentioned in the Government of Nepal's Health Care Waste Management Guidelines 2014[2] as one of the models for health care waste management in Nepal.

Mercury Collection House


Waste segregation in wards

[1] See http://www.nepjol.info/index.php/NJST/article/view/14356/11662.
[2] See http://www.mohp.gov.np/images/pdf/HCWMG_Guideline.pdf.

Trained staff transports waste to the waste treatment and storage center

Autoclaves at Bir Hospital

Construction of the biodigestion plant

Garden with recycled products built on top of biodigestion plant for awareness raising

The Issue

Before Bir Hospital implemented the "Health Care Waste Management Program", the hospital was known for its improper waste management practices. The hospital previously dumped its medical waste on the street for collection by the local municipal garbage truck and disposal through the municipal waste stream, along with other local waste. This practice endangered individuals serving the waste industry through direct contact with possibly contaminated and infected wastes. The waste handlers, rag pickers and all other members of the waste collection system were at risk with disease transmission, injury, chemical exposure, and other health-related concerns.

Sustainability Strategy Implemented

The transformation at Bir Hospital was made possible through the leadership of its Director, Prof. Dr. Buland Thapa. He took the necessary initiatives to collaborate with Health Care Foundation Nepal (HECAF-Nepal), Health Care Without Harm (HCWH)

and WHO to ensure that the transformation towards a more environmentally conscious hospital was a success.

HECAF, a founder member of GGHH, took responsibility for training the nurses, housekeeping staff and other relevant staff of the hospital. The training explained to them their roles and responsibilities in the health care waste management system. HECAF also developed a Standard Operating Procedure for proper management of waste in collaboration with the hospital.

The staff of the Waste Management Section manages and maintains the waste treatment and storage center, the autoclaves and the biodigestion plant. Nurses and support staff of the hospital have been trained on waste segregation, handling and storage in wards. A Waste Management Committee was formed on June 9, 2010 to oversee waste management related activities and make important decisions. The committee is chaired by the Director of Bir Hospital.

To date, the hospital has not allocated a separate budget for health care waste management. However, they have identified it as an area that needs a separate budget provision. HECAF and Bir Hospital are continuously lobbying to get the government to provide a separate budget for health care waste management.

Implementation Process

After receiving a formal request from the Director of Bir Hospital, HECAF conducted a baseline and diagnostic assessment of the hospital's waste in 2009. Within less than a year, a waste treatment and storage center was established and two validated autoclaves for the disinfection of medical waste were installed in this center.

Following the successful implementation of waste segregation, handling and storage in a model ward, the system was replicated in most of the in-patient wards of the hospital by the end of 2010.

The story of Bir Hospital's radical transformation has been presented at various national and international seminars and conferences. The hospital has been an advocate for safe and environmentally sound health care waste management in various international forums of WHO and the Safe Injection Global Network. The hospital has also been actively organizing seminars in Nepal to disseminate knowledge about the role of the health care sector in the green movement. It played a pivotal role in the organization of a national conference on health care waste management in Kathmandu on July 30, 2014. Moreover, Bir Hospital allows the general public, other medical institutions and government officials to observe its pioneering health care waste management system and learn from the established system.

Challenges and Lessons Learned

The systematic collection and monitoring of data is a major challenge in the hospital. Hospital staff has not shown initiative to monitor data. The hospital and HECAF is working together to create a systematic data collection and monitoring system.

Lessons Learned from the Implementation Process

- Obtain full management support from director, head of nursing and housekeeping
- Orient all staff at the start of the process
- Successfully implement change in one ward first. This ward will later serve as a model ward for replication throughout the hospital
- Adopt a participatory approach. At Bir Hospital, nurses, medical staff, hospital management staff, and even the security guards were involved in designing the health care waste management system
- Incorporate awareness raising in all planned activities
- Organize regular awareness raising and training on health care waste management for new and existing hospital staff, and for the community

Next Steps

The hospital plans to replicate the safe health care waste management system into all units, including OPD and the newly established trauma center.

The hospital's thermometers, blood pressure devices and dental amalgams are already all mercury free. As next steps, the hospital plans to replace fluorescent tubes and other lightbulbs with LEDs, and substitute laboratory chemicals that contain mercury.

Demographic Information

Bir Hospital, established in 1889, is a tertiary level government hospital situated in Kathmandu, Nepal. In 2002, Bir Hospital was developed into the National Academy of Medical Sciences to provide higher education in Medicine. It currently has 460 beds with 26 wards, an emergency department, a general operation theater, a special operation theater, and specialized OPD services. Every year, Bir Hospital admits about 8,500 in-patients, deals with over 300,000 out-patients and treats over 60,000 accident and emergency cases. Bir Hospital provides services in highly specialized areas like neurology, neuro-surgery, cardiology, cardio-thorasic and vascular surgery, burn and plastic surgery, nephrology, urology, G.I. surgery, gastroenterology, hepatology and radiotherapy. The majority of out-patient examination services and in-patient beds in Bir Hospital are free. This is the only tertiary referral center in the country that provides free services.

Quotes

"I would say do not be afraid to change. Certain things need to change to bring about an effective system. It is difficult in the beginning. It is unacceptable. People do not accept it if you bring change. But moving them and yourself will bring change. It is possible and really rewarding to you." – *Dr. Buland Thapa, Former Director, Bir Hospital*

"I visited Bir Hospital while the health care waste management system was being implemented there. I saw the transformation from medical waste being haphazardly thrown in and around the hospital, to the set up of a system that resulted in a clean and safe environment both inside and outside the hospital. … We are now engaging with HECAF to develop the health care waste management system in two of our hospitals." – *Dr. Bharat K. Pradhan, Executive Director, Public Health Concern Trust (PHECT-Nepal)*

"I used to work at Bir Hospital and learned about the model health care waste management system when I was there. Now I want to bring that system to this hospital." – Ms. *Ranjana Chetri, Assistant Nursing Director, Kathmandu Medical College (currently implementing the health care waste management system with technical support from HECAF)*

Links

- Three-Minute Video on the Transformation of Bir Hospital's Health Care Waste Management System by Russ Pariseau – https://noharm-global.org/articles/news/global/video-bir-hospital-transforms-its-healthcare-waste-management or https://vimeo.com/90137654
- World Health Organization Regional Office for South-East Asia's Case Study on Managing Health Care Waste at Bir Hospital – http://www.searo.who.int/entity/water_sanitation/bir_hospital_booklet.pdf
- Presentation on "Validating Autoclaves for Medical Waste Disinfection: A Case Study" by Ruth Stringer, International Science and Policy Coordinator, Health Care Without Harm, November 2010 – http://www.noharm.org/lib/downloads/waste/Presentation_RStringer_Autoclave_Validation_Nepal_SIGN_2010.pdf
- Interim Report of the Health Care Waste Management System in Bir Hospital – https://noharm-global.org/sites/default/files/documents-files/2042/Bir_Hospital_Interim_Report.pdf

Key Words/Topics

Safe, Health Care Waste, Autoclave, Segregation

Footnote

Since this case study was written, a new director was appointed at Bir, and Nepal suffered a magnitude 7.8 earthquake. The quake, on 25th April 2015, killed over 8,000 people and injured 22,000, and although the staff of Bir Hospital continued tirelessly to treat the injured, some of the buildings were severely damaged. The reconstruction plans required that the waste management center be demolished and relocated. These changes naturally mean that the development of the system as described in "Next Steps" has not continued as planned. It is hoped that future case studies will be able to report the latest developments.