



Improving the Management of Waste and Generating Revenue.

Aravind Eye Care Hospitals, Pondicherry

GGHH Agenda Goals

- Waste

Hospital Goal

- Safe treatment and disposal of waste
- Diverting waste from landfill and increasing recycling levels
- Reducing waste volumes in all streams (general, clinical, food)

Progress Achieved

- Financial benefits: Through resale of plastic, paper and aluminum product gathered from waste, the hospital generated INR 147,456 (US\$2,185) in year 2016
- Provided better occupational safety for the hospital workers who handle bio-medical waste
- Safe health care waste management implemented in all the units—with a governance structure and system in place for safe waste segregation, transportation, treatment using autoclave technology, and recycling.

The Issue

Bio-medical waste management is becoming a major issue not only in hospitals and nursing homes but also to the environment. The waste generated from a hospital is a potential health hazard to the health care workers, patients, hospital visitors, public and flora and fauna of the area

After the Ministry of Environment, Forest and Climate Change of India released the Bio-Medical Waste Management Rules, it is now a legal requirement to safely dispose bio-medical waste. But the implementation of rules and proper management remained absent at large. Currently, the major issue related to Bio-Medical Waste management in many hospitals is that the implementation is unsatisfactory as some

hospitals are disposing waste in a haphazard, improper and discriminate manner. Lack of segregation practices can cause mixing of bio-waste with general waste making the whole waste stream hazardous. Inappropriate segregation results in incorrect method of disposal. Also, there is a lack of awareness between hospital staffs who manage these waste. They are not aware of how improper handling of waste from the hospital could have direct implication on their health.

Inadequate Bio-Medical waste management thus will cause environmental pollution, unpleasant smell, growth and multiplication of vectors like insects, rodents and worms and may lead to the transmission of diseases like typhoid, cholera, hepatitis and AIDS through injuries from syringes and needles contaminated with human

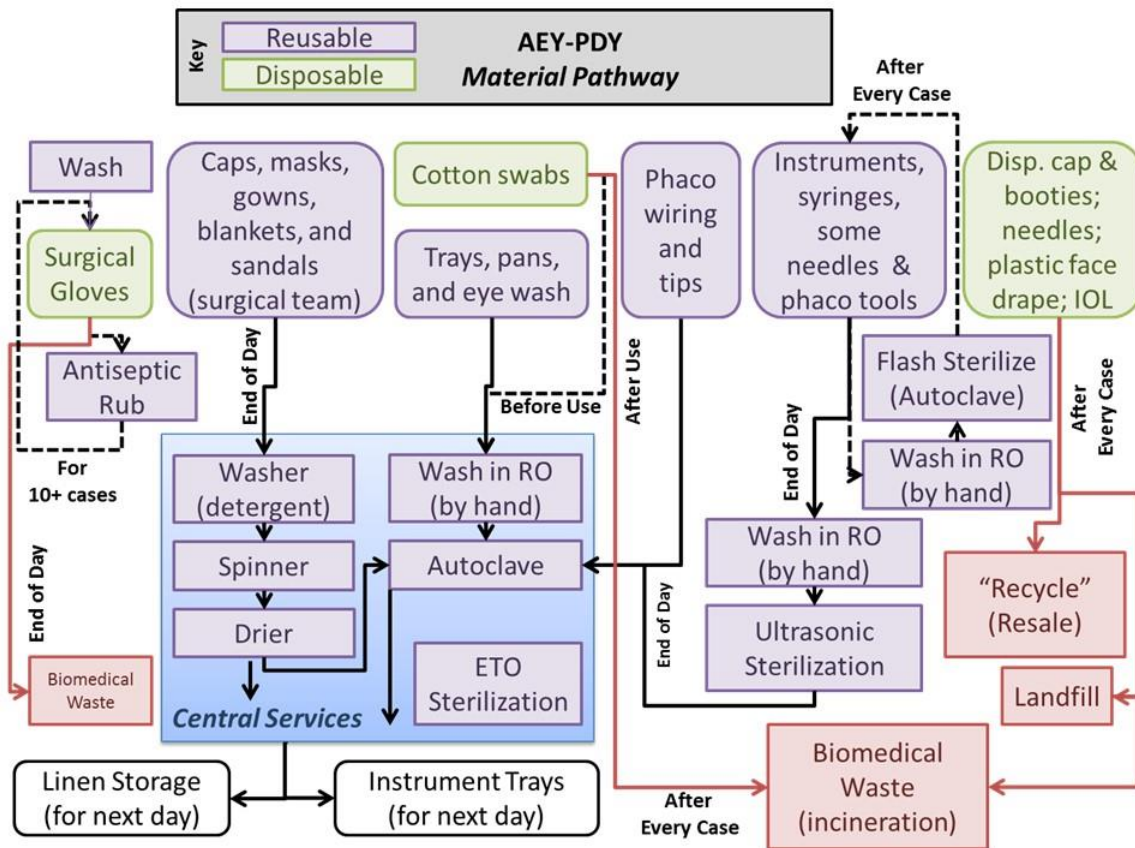


Figure 1: Waste Segregation Process at Operation Theatre

Sustainability Strategy Implemented

The transformation at Aravind Eye Care Hospital, Pondicherry was possible through the leadership of its Chief Medical Officer, Dr. R. Venkatesh, Pondicherry facility management staff and with the help of Dr. Cassandra Thiel, NYU School of Medicine, who was a Fulbright-Nehru Academic scholar conducting research on resource-use in cataract surgery with the Aravind eye care system. The hospital management took appropriate action to ensure the transformation towards an environmentally safe

facility. All staff members were oriented and trained to implement safe hospital waste management.

Following the motive to move towards proper and efficient handling of bio-medical waste, the following waste management strategies were implemented.

- A waste management team was formed
- Sensitization for hospital management and nursing staffs
- Training of the nursing and housekeeping staff of hospital on the importance and difference between normal waste and bio-medical waste
- The facility manager took responsibility in looking at the efficiency at which this is managed
- Employees handling waste were given proper awareness on bio-medical waste and safe disposal of waste was conducted
- The waste generated and disposed was recorded, this helped us understand our different types of waste.
- The reusable materials were resold creating revenue from this model.

Waste Generation from Phaco Surgery (AEH-PDY 2015)

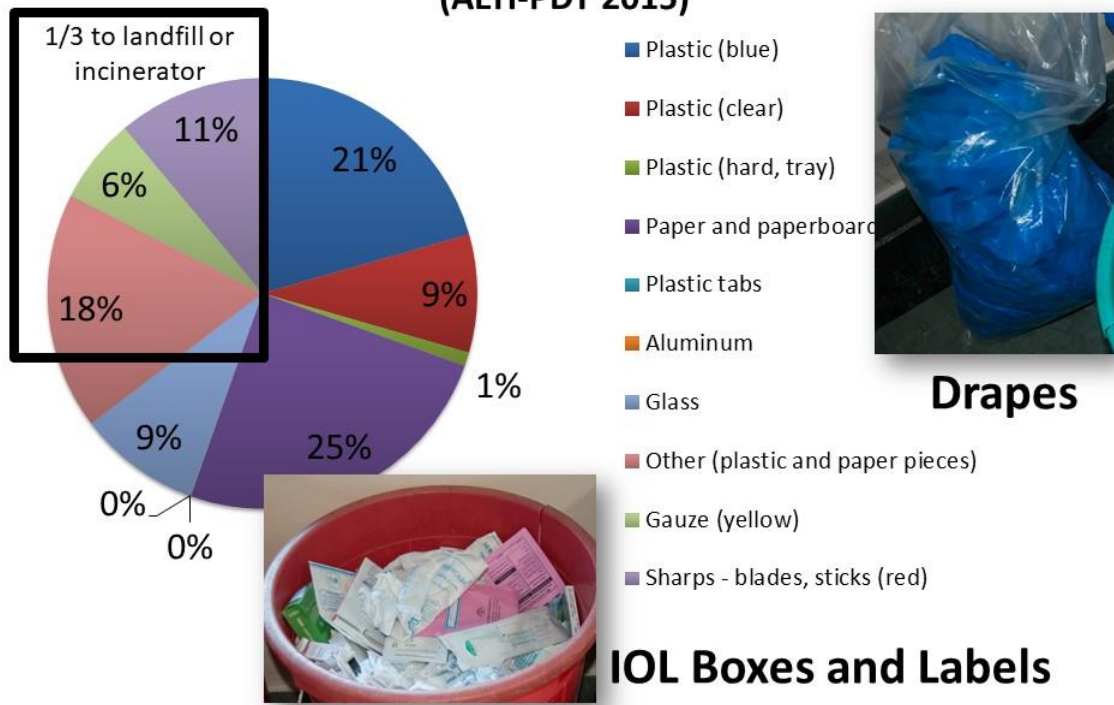


Figure 2: Amount of Waste Generated.

Implementation process

- All wastes were segregated at source of generation as mentioned in the Bio-Medical Waste Management Rule (Government of India) by using different colored bins.
- Implementing segregation at source was complex because the staffs did not understand the complexity of separating the bio-waste from common waste at the disposal stage.
- Reusable plastic sheets, paper, plastic bottles, aluminum, glass, blue plastic and other general waste was segregated separately at source.
- The bio-medical waste is also separated at this stage
- The segregated hazardous waste is taken outside in a safe sealed bag and handled as per regulation
- The reusable plastic, paper and metals are taken outside and stored. More bins of the same color were introduced for collecting the common resalable waste.
- The plastic, paper and aluminum materials are sold twice every month.
- Thus, the resalable waste and bio-medical waste were separated and the segregation process improved.



Figure 3: Waste Segregation At Source

Tracking Progress

Generation of health care waste is tracked by weighing the collected waste at the hospital before sending it to the recycling unit. Success is measured by the ability to

treat and recycle as much waste as possible which is produced in the facility. Regular staff meetings are conducted to ensure efficient work is done. Monthly reports of waste produced, amount of waste sold for recycling, income from the sale of recycling and any profits made are prepared and submitted to the management including all financial details and waste generation. At present, 330 kilograms (kg) of weight is generated every day. Of which, bio-medical waste is 7.5kg, recyclable waste is 78 kg and the waste taken care by the municipal corporation is 245 kg. Corporation waste generally constitutes of dust, wet paper waste, food covers and food waste. The facility sees a foot fall of about 1500 out-patients every day and an in-house capacity accommodating an average of 240 patients on a daily basis. Thus, averaging 0.190 kg per patient per day. Initiatives are made to stop the out-patients from bringing in more plastics. Scientific practices and methods are considered to reduce the in-patient generated waste.

Challenges and lessons learned

The hospital is working towards identifying more efficient ways in reducing generated waste. More awareness needs to be given to hospital staffs, patients and visitors on general waste and bio-medical waste management. Initiatives and measures are taken to use the given resources properly. New ideas are being discussed regularly to reduce our waste generation and how we can generate energy from the waste generated. Some of the areas where we are trying to improve are listed below:

- Employee Time & Efficiency of this process should be improved
- Patient Safety to be improved
- Employee Safety to be improved
- Facility and the campus moving towards sustainable and green operation
- Improve waste segregation process at source in operation theatre and other areas.
- Reduce the overall wet waste.

Next Steps

It was a challenging move to change our waste management practices, but after a successful inception there are a few areas which needs improvement. Actual time taken at every step needs to be noted and chances for improving the process needs to be explored. The resold waste materials are stored in an outdoor facility before sale. Since the sale of products are not done daily relocating the outdoor facility to a weather proof zone to save the materials from getting damaged needs to be done.

The facility has a biogas generator to produce biogas from wet waste. But, the food waste is not converted into biogas as per potential. Thus, a new method or reactor will be added to produce potential energy. A plan to reduce the overall waste generated is under process. As a start, the facility has employed a plan to not allow any out-patients to carry any plastic bags from outside. This strategy has helped in reducing littering of plastic bags inside the campus.

Other means of monitoring will also be employed to better evaluate the program. Currently, a study is under planning to evaluate procurement processes. The study will look into scientific proof on how to reuse items in a medical facility.

Demographic information

Aravind Eye Care Hospital is an eye care hospital chain in India. It was first founded in 1976 in Madurai, the hospital chain now has 10 eye care hospitals in Tamilnadu. The Pondicherry facility was inaugurated in 2003. The facility has a capacity of 450 beds for in-patients and efficiently provides services for 1600 out-patients every day. The hospital is located on the highway connecting coastal towns Pondicherry and Cuddalore. The hospital is 25 acres wide and has housing facilities for physicians and staffs. It also has a paddy field for rice production, a vegetable garden for food production, a wide spread garden with a pond which also acts as an aerobic polish pond for treating the recycled water. The plant nursery located inside the campus sell plants for patients and visitors.

Links

To know more about the DEWATS system: <http://www.borda-sea.org/basic-needsservices/dewats-decentralized-wastewater-treatment.html>

To learn more case studies documented in Aravind Eye Care System:

<http://www.aravind.org/default/aboutuscontent/casestudiesOnAravind>

To learn more about Health and Environment Leadership Platform's work and other case studies:

<https://www.ceh.org.in/activities/help/about/>

Main contact person information: N.Vengadesan

Email:vengadesan@aravind.org

Telephone n°: +91- 8012305151

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