



## Health

### Maternal and Child Health Community



## Environment

### Water & Environmental Sanitation Network (WES-Net India)



## The Maternal and Child Health Community and Solution Exchange for WES-Net India Consolidated Reply

*Query: Biomedical Waste Management in Rural PHCs, from  
Exide India, Bangalore*

Compiled by [Meghendra Banerjee](#) and [Jyotsna Bapat](#), Resource Persons; additional  
research provided by [S.S. Abbas](#) and [Ramya Gopalan](#), Research Associates  
5 May 2006

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### Original Query: Venkatesh Harvoo, Exide India, Bangalore

Posted: 11 April 2006

**Moderator's Note:** Since this query pertains to issues addressed in both MCHHealth and WES-Net Communities, it is being cross-posted in both the communities for responses. We look forward to your responses.

Dear friends

I am a Medical Officer working at a company in a rural area in the outskirts of Bangalore. I have often noticed biomedical waste like placenta and other products of conception from the local PHC being dumped in the nearby river and in open fields, which undoubtedly is polluting the river.

As a part of its Corporate Social Responsibility, our company is closely associated with PHCs in its activities and we are working on helping the PHCs to evolve and manage a Bio Medical Waste Management (BMWM) plan under the programme.

I invite suggestions and inputs from the community on two counts:

- How can biomedical waste be managed in a rural PHC?
- If anyone knows of similar initiatives anywhere else in the country?

I wish to thank you all in advance, and am looking forward to hearing from you.

Venkatesh Harvoo  
Exide India  
Bangalore

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## Responses received, with thanks from:

1. [Rajesh Rangarajan](#), Toxics Link, Chennai
2. [R. Santhanam](#), Indian Society of Agribusiness Professionals, New Delhi
3. [Dr. Avinash Shetty](#), Dept. of Community Medicine, KMC Manipal
4. [Prof. Arunabha Majumder](#), All India Inst. of Hygiene of Public Health, Kolkata
5. [Dr. B.L.Kaul](#), Society for Popularization of Science, Jammu
6. [Kusum Gopal](#), LSE, London, UK
7. [Ratna Singh](#), Toxics Link, New Delhi
8. [Farrukh Khan](#), Find Your Feet, Lucknow
9. [Pushkar Srivastava](#), Asian Development Bank, EMTK, Trivandrum
10. [Ramesha Gowda](#), Karnataka
11. [Dr. K.S. Baghotia](#), State Programme Officer (BMW Mgmt), New Delhi
12. [Pallavi Patel](#), CHETNA, Ahmedabad
13. [Prabhjot Sodhi](#), UNDP GEF SGP, New Delhi

*Further contributions are welcome!*

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## Summary of Responses

In response to the query on Bio Medical Waste (BMW) Management in rural Primary Health Centres (PHCs), members' responses largely recommended the option of a common bio-medical waste disposal facility. Additionally responses provided details on the kinds of waste generated, the treatment options available and recommendations that require consideration when establishing treatment facilities.

On the issue of managing biomedical wastes, as enumerated by members' responses, PHC's largely have two kinds of wastes: organic waste (anatomical waste) from deliveries and inorganic (sharps waste) from immunization practices. Members' suggested the following treatment options based on the [categories of waste](#) usually generated by PHCs:

- Waste Category 1 (i.e. placentas) - Disposal can be done in a secured (and approved) deep burial site if no incineration facility is available in the hospital or nearby areas. This option is mainly for towns with small population, the site established in a manner that does not affect the ground water table.
- Waste Category 5 (discarded, outdated or contaminated medicine and cytotoxic drugs) – Such wastes should be stored in a secure place with periodic transportation to a secured landfill in an authorized vehicle.
- Waste Category 6 and 7 (soiled and solid waste) - Use either the process of [autoclaving](#) or microwaving.
- Waste Category 8 and 10 (liquid and chemical waste)- Chemical treatment using at least 1% hypochlorite solution (or any other equivalent chemical reagent) with a minimum contact period of 30 minutes subsequently discharge into sewers/drains for liquids and secured landfill for solids.

Additionally members suggested using concrete compost pits for biomedical waste disposal, trenching as an acceptable option for general and infectious waste disposal and [vermiculture](#) for

organic waste conditional on obtaining the appropriate ethical clearance. The Government has recommended the use of autoclave for the treatment of infectious plastic waste. The wastes could be boiled in water or treated chemically, if autoclaving is not possible.

Since a number of methods are available for BMW disposal members recommended that the CHC/PHC make necessary arrangements to impart autoclaving treatment on a regular basis.

Several members shared experiences dealing with BMW management in rural PHC's. In [Udupi District, Karnataka](#) a member explained the possibility of outsourcing BMW management to private companies. The example of [Baroda, Gujarat](#) further highlighted the need for strengthening awareness and capacity building of health professionals as well as communities for effective BMW management.

The members' responses provided recommendations that are essential for building capacities on handling, segregation and treatment of biomedical waste particularly for rural PHCs. The suggestions included the following:

- Conduct a baseline survey to understand the existing situation, and determine what actions are needed
- Create a system of regular monitoring and assessment to ensure effective implementation of the biomedical waste act as per management and handling [rules](#)
- Segregate health care waste in colour containers and colour plastic sacks to ensure safe disposal and treatment
- Impart proper training for all health care personnel with IEC materials to develop awareness and sensitization:
  - Intensive training of all health centre staff to handle (BMW) generators and be aware of BMW management as per the safety norms and guidelines laid by the Pollution Control Board
  - Basic training of all the nursing staff, ward boys and Class IV staff, directly exposed to the infectious biomedical waste on safe handling of BMW
  - Awareness campaign among all senior health centre staff, administrative staff, local government, Municipal Corporation, Pollution Control Board etc.
  - Setting up demonstration facility as a model to train staff
- Encourage communities (as direct beneficiaries) to participate in BMW management to prevent landfills and contamination of water bodies, thereby minimizing risks of infection

The members also recommended using a common waste treatment plant owing to the cost and maintenance requirements for individual plants. However, the problem of disposal remains in areas that lack waste treatment facilities or remotely located PHCs, from where collection of wastes is logistically unviable. In such cases, members suggested it maybe worthwhile to explore the possibility of private waste management facilities. On a cautionary note, members highlighted the problem of waste being dumped by private companies without consideration for sanitation and ethical concerns.

BWM is a critical issue in India and demands attention, members felt. The responses provided a number of experiences and resources, detailed below.

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## Comparative Experiences

### Karnataka

**Private Waste Management Facility** (from [Avinash Shetty, KMC, Manipal](#))

To enable cost-effective waste disposal, many small hospitals in Udupi District have outsourced their waste management systems to private companies. The company bears the responsibility of collecting, transporting and disposing all the hospital waste. In return, it charges a monthly fee from the hospitals based on the number of beds.

## Gujarat

**Education and Training for Biomedical Waste Management and Handling** (from [Prabhjot Sodhi](#), UNDP GEF SGP, New Delhi)

This project aims at building capacities of stakeholder communities such as hospitals and local doctors to effectively implement the Bio-Medical Waste Management System for the city of Baroda and to impart proper trainings, capacity building on handling and segregation of Bio-medical waste and build awareness amongst the residents, shops and neighbourhood by individually targeting the 800 hospitals in the city

## Maharashtra

**Using 'An Eco-Friendly Technique for Managing Biomedical Waste'** (from [R. Santhanam](#), Indian Society of Agribusiness Professionals (ISAP), New Delhi)

In Pune, an indigenous way to dispose biomedical waste and convert it into solid compost was developed. It claims to utilise the technique of 'biosensors' or nature's own homeostatic mechanisms to help control pollution in its truest sense. The resultant sludge is free from any pathogens.

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## Related Resources

### *Recommended Organizations*

From [Rajesh Rangarajan](#), Toxics Link, Chennai

#### **Central Pollution Control Board, New Delhi**

<http://www.cpcb.nic.in/>

*The site lists guidelines for designing and constructing of bio-medical waste incinerators.*

#### **Himalayan Institute Hospital Trust, Dehradun**

<http://www.hihtindia.org/>

*Recommended for its reasonable success in managing low volume waste and for practical tips on the implementation of BMW management*

From Ramya Gopalan, Research Associate, Environment Communities

#### **Department of Health, Government of National Capital Territory of Delhi, New Delhi**

<http://www.delhigovt.nic.in/dept/health/bmwm.asp>

*This link provides a directorate of health services focusing on status of BMW, problems faced by health centres, steps taken by government to resolve these problems*

#### **West Bengal Pollution Control Board, Kolkata**

<http://www.wbpcb.gov.in/html/biomed.shtml>

*This link of the WBPCB provides a list of health care units who are in full/partial compliance with the Waste Handling Rules*

**Citizen, Consumer and Civic Action Group (CAG) and Toxics Link, Chennai**

<http://www.cag.org.in/>

*Engaged in auditing of eighteen government-run public healthcare institutions in Chennai on medical waste management practices with a training programme for core groups*

**Recommended Contacts**

**Shayamala Mani or Madhavi Joshi**, CEE, Ahmedabad (from [Pallavi Patel](#), CHETNA, Ahmedabad)

[madhavi.joshi@ceeindia.org](mailto:madhavi.joshi@ceeindia.org)

*Recommended for developing Information Education Communication (IEC) material for Hospital Wastes*

**Snehal J. Shah**, Sadguru Shree Jivanji Maharaj Memorial Foundation, Vadodara ([Prabhjot Sodhi](#), UNDP GEF SGP, New Delhi)

32- Mihir Park, Old Padra Road, Vadodara – 390 020

Ph No: 0265 – 2314992; Fax: 0265 – 2354119

*Recommended as the NGO partner for the project titled Educating and Training for Bio-Medical Waste Management and Handling aimed at awareness and capacity building*

**Recommended Websites**

**Healthcare Waste Management** (from [Rajesh Rangarajan](#), Toxics Link, Chennai)

[www.healthcarewaste.org](http://www.healthcarewaste.org)

*The site lists WHO Programme activities & technical literature for creating national action plans & building capacity to enhance the way HCW is dealt with in low-income countries.*

**Biomedical Waste Management in Karnataka** (from [Ramya Gopalan](#), Research Associate, Environment Communities)

<http://kspcb.kar.nic.in/BMW/Introduction.asp>

*A web-based knowledge site on bio-medical waste management conceived by TERI, hosted and maintained by the KSPCB.*

**Recommended Documentation**

From [Rajesh Rangarajan](#), Toxics Link, Chennai

**The Bio-Medical Waste (Management and Handling) Rules, 1998**

Ministry of Environment and Forests, Notification, New Delhi, 20<sup>th</sup> July, 1998

<http://www.envfor.nic.in/legis/hsm/biomed.html>

*The Bio Medical Waste (Management & Handling) Rules, 1988 lists the categories of wastes and comprehensive guidelines on the management of BMW in the country.*

**Bio-Medical Waste (Management and Handling) (Amendment) Rules, 2003**

Ministry of Environment and Forests, Notification, New Delhi, 17<sup>th</sup> September, 2003

[http://www.envfor.nic.in/legis/hsm/so-1069\(e\).html](http://www.envfor.nic.in/legis/hsm/so-1069(e).html)

*This notification is an amendment to the 1998 guidelines*

**Management of solid health-care waste at primary health-care centres: A decision-making guide**

WHO, 2005, available at

[http://www.who.int/entity/water\\_sanitation\\_health/medicalwaste/decisionmguiderev221105.pdf](http://www.who.int/entity/water_sanitation_health/medicalwaste/decisionmguiderev221105.pdf)

(Size: 462KB)

*The document provides authoritative guidance for selecting the most appropriate method for safely managing solid waste generated at PHCs in developing countries.*

### **Guidelines for Disposal of Bio-medical Waste Generated during Universal Immunisation Programme (UIP)** (from [Ratna Singh](#), *Toxics Link*, New Delhi)

Central Pollution Control Board, New Delhi, November 2004

<http://www.solutionexchange-un.net.in/environment/cr/res21040602.doc> (Size: 63.5 KB)

*Guidelines prepared by The Central Pollution Control Board (CPCB) for disposal of bio-medical wastes expected to be generated under UIP*

*From S.S. Abbas, Research Associate, Health Communities*

### **Better health care waste management: An integral component of health investment**

P Rushbrook, R. Zghondi; WHO & World Bank, Amman, 2005, available at

[http://www.who.int/entity/water\\_sanitation\\_health/medicalwaste/bhcmeng.pdf](http://www.who.int/entity/water_sanitation_health/medicalwaste/bhcmeng.pdf) (PDF 2 MB)

*Publication designed to provide managers and technical staff of health care facilities with the confidence to tackle poor health care waste management even in modest resources.*

### **Policy analysis: Management of health-care wastes**

WHO

[http://www.who.int/water\\_sanitation\\_health/medicalwaste/polanalysis/en/index.html](http://www.who.int/water_sanitation_health/medicalwaste/polanalysis/en/index.html)

*A document which looks into various causes of improper management of health care wastes and the implications.*

### **Safe management of wastes from healthcare activities**

Eds. A. Prüss, E. Giroult and P. Rushbrook, WHO, 1999

[http://www.who.int/water\\_sanitation\\_health/medicalwaste/wastemanag/en/index.html](http://www.who.int/water_sanitation_health/medicalwaste/wastemanag/en/index.html)

*This handbook, the result of extensive international consultation & collaboration, provides guidance on safe, efficient, and environmentally sound HCW management methods*

### **Teacher's guide: management of wastes from health-care activities**

WHO, Geneva, 1998; available at

[http://www.who.int/water\\_sanitation\\_health/medicalwaste/wsh9806/en/index.html](http://www.who.int/water_sanitation_health/medicalwaste/wsh9806/en/index.html)

*Guide provides teaching materials & recommendations for a short training course, mainly for managers of health-care establishments, public health professionals & policy makers.*

### **Management of bio-medical waste: awareness and practices in a district of Gujarat**

NB Pandit, HK Mehta, GP Kartha, SK Choudhary; *Indian J Public Health*; 2005 Oct-Dec; 49(4):245-7 (paid publication)

*A cross sectional study done at 30 hospitals finding that no effective waste segregation, collection, transportation and disposal system at any hospital in the district.*

### **Biomedical immunization waste management--an AP experience**

SB Kaipilyawar; *Indian J Public Health*; 2004 Apr-Jun; 48(2):60-2 (paid publication)

*The study points towards feasibility of introducing small puncture proof containers and needle cutters as a solution for sharp waste management at the rural settings.*

### **Vermiculture**

Department of Agriculture, Port Blair

[http://agri.and.nic.in/vermi\\_culture.htm](http://agri.and.nic.in/vermi_culture.htm)

*Explains the process and advantages of vermiculture as a method of treating organic waste*

### **Autoclaving**

Office of Environmental Health and Safety, Yale University

<http://www.yale.edu/oehs/bbpstuff/autoclav.htm>

*Explains the principles, consideration and limitations of functioning of an autoclave device*

*From Ramya Gopalan, Research Associate, Environment Communities*

### **Biomedical Waste Management: An Infrastructural Survey of Hospitals**

Rao et al, MJAFI, Vol. 60, No. 4, 2004

<http://www.medind.nic.in/maa/t04/i4/maat04i4p379.pdf> (Size: 23KB)

*A study of hospitals from various sectors like Govt, Private, Charitable institutions etc. to assess the infrastructural requirement for BMW Management Cost was worked out*

### **A TQM Approach to Implementation of Handling and Management of Hospital Waste in TATA Main Hospital**

NK Das, Sushanta Prasad, K Jayaram, issued by Hospital Waste Management Committee, T.M.H

<http://www.medind.nic.in/haa/t01/i1/haat01i1p75o.pdf> (Size: 232 KB)

*Studies the problem of BMW and implementation of the Total Quality Management (TQM) concept as a system for managing waste in TATA Main Hospital*

### **Towards a Healthy Future**

Biomedical Waste Management, Gujarat Pollution Control Board, Gandhinagar

[http://www.gpcb.gov.in/bmw\\_ws.pdf](http://www.gpcb.gov.in/bmw_ws.pdf) (Size: 1 MB)

*Provides information on the various kinds of wastes generated, technological options available and the benefits that emerge from proper handling of BMW*

### **Related Past Consolidated Reply**

**Solid waste management in urban settings**, from Nidhi Prabha Tewari, Sanket Information & Research Agency, New Delhi (Advice). Issued 16 August 2005

<http://www.solutionexchange-un.net.in/environment/cr/cr-se-wes-16080501-public.pdf> (Size: 60 KB)

*Highlights successes and failures of recycling and revenue generation potential of solid wastes through case studies*

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## **Responses in Full**

### **Rajesh Rangarajan, Toxics Link, Chennai**

First, the guiding document on bio-medical waste management is the Bio-Medical Waste (Management and Handling) Rules 1998 (and further the 2003 amendment), a copy of which can be accessed on the Ministry of Environment [website](#). This is by and large a comprehensive document and provides for clear treatment and disposal methods.

Second, PHCs would largely have 2 kinds of wastes: organic waste (anatomical waste) due to deliveries and inorganic (sharps waste) due to immunization practices. A guide to waste management at the PHC level has been published by the WHO, a copy of it is [linked](#) for your reference.

Finally, you may also want to refer the Guidelines under the Universal Immunization programme, a document on the [Central Pollution Control Board](#)

Further, the [Himalayan Institute Hospital Trust](#), I think has been reasonably successful in managing such low-volume waste. You could probably contact them for some practical tips on implementation.

In case of any further clarifications please do revert.

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#### **R. Santhanam, Indian Society of Agribusiness Professionals, New Delhi**

This refers to the query on biomedical waste. Using the technology of Biosanitiser, a biomedical waste treatment facility was set up in a Pune based hospital which is functional for more than 9 years. The body tissues get converted into a mud like material, said to be free of any pathogens. The resultant stabilized compost can be applied to soils in gardens. Virus pathogens were deliberately introduced into the bin which composts the hospital biomedical wastes. The resultant was analyzed for pathogens. Details of the experiment is available at the [website](#).

Although legislative act Bio-Medical Waste (Management and Handling) Rules 1998 (and further the 2003 amendment), offers detailed methodologies, such as incineration or deep pit burial, it is silent on alternative technologies such as Biosanitiser. In this methodology, waste/pollutant is not converted from one form into another which still poses problems. Hospital waste incineration, especially of plastics is a big issue in USA, with environmental activists up in arms. It is hoped that the concerned decision makers will take note of this technology and after proper evaluation by independent agencies, make a verdict or give a decision to use this technology, which is more convenient.

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#### **Dr. Avinash Shetty, Dept of Community Medicine, KMC Manipal**

Bio Medical waste management is an important issue today for the hospitals. I am working in a MCH hospital in a rural area which is similar to PHC.

Since the cost of setting waste management facility is too high, the only way is to have a common disposal facility. There are many private waste management facilities being set up now in most cities and we have entered into an agreement with a private company in our district. The company takes the responsibility of collecting, transporting and disposing of all types of hospital waste for which we pay a fixed rate calculated based on number of Beds. Most of the hospitals in our District {Udupi dist, Karnataka state) have joined this private waste management company.

I feel this is the only way for smaller health centers like PHCs to dispose the waste.

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#### **Prof. Arunabha Majumder, All India Inst. of Hygiene of Public Health, Kolkata**

If proper health care services are provided in PHCs then amount of health care waste is 700 grams per bed per day. However it may be less in some specific PHCs. Biomedical waste is 1/3rd and rest is General type of waste. In PHCs Campus Pits are recommended for disposal of biomedical waste. Campus pits are made of concrete. It is circular type of diameter 3 meters, depth 3 meters; volume approx 20 cub meters. It has three manholes with proper cover and gas

vent pipe. At least two campus pits are constructed. Each pit can cater for approx 3 years; 2nd pit is to be used after the 1st pit gets filled up.

For general waste disposal by trenching is acceptable. Vermiculture is recommended for Organic waste. Placenta can be placed in vermiculture pit. I tried with the same. I got good result. But methodology will need ethical clearance. There must be needle cutter, syringe cutter and dedicater scissors for gloves, catheter, IV sets, blood bags etc. For disinfection 1% BP/ hypochlorite solution is to be kept. Colored containers along with colored plastic sacs are to be used for segregation of health care waste.

We need also proper training for all health care personalities. IEC materials will be required for awareness and sensitization.

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### **Dr. B.L.Kaul, Society for Popularization of Science, Jammu**

Dr. Avinash Shetty's communication on the subject of Bio-medical waste disposal in Udupi District [Karnataka State] is worth emulating elsewhere too. In J & K State we are facing an acute problem of disposal of biomedical wastes especially in the cities of Jammu and Srinagar, where besides the Govt. hospitals a large number of Private hospitals and Nursing homes have come up recently. The Municipal Corporations are not able to cope with this task as it involves infection carrying material needing specialized disposal. SPS has raised this problem at a number of forums on various occasions but a solution has evaded us. The solution that Dr. Avinash has suggested is a good one and I hope that State of Jammu and Kashmir should follow it.

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### **Kusum Gopal, LSE, London, UK**

One advantage of organic waste is that it is never harmful as indeed, plastic and other such materials are - it can be put into the ground and earth will benefit by it. Land waste sites also need such waste.

In the subcontinent, whether it is in parts of Afghanistan, Pakistan, Nepal, Sri Lanka, Burma, Bangladesh and indeed, India, the process of birth is sacred and traditionally as I have witnessed, in some of these countries a hole is dug very deep in the ground (to avoid dogs digging it up) and the placenta is buried along with the birthing substances. And, often over it there is a bush planted. It would also encourage gardening, albeit in a small way.

This seems quite inexpensive and also organic. "Everything we are comes from the earth to which the body must return" even as the soul flies away and inhabits another is a widespread belief-- even some itinerant dervishes fascination with the soul has music about these birthing practices.

Urban Indian hospitals are extremely hard to maintain and particularly because there is such a great demand and constant cleaning is not easy to keep up with. Many staff working in delivery wards often do not know what to do and it would be extremely useful if medical staff at the senior levels devise some plan whereby placenta could be buried and covered. Machines are expensive to run and given the size of India it is not feasible

Also, it might interest you to note that in Denmark and Sweden where I conducted research on childbirth, many women froze the placenta after giving birth in their fridge during the winter months so that they could bury it outside in their gardens during Spring and plant a rose bush over it.

Further, one of the unrecognized problems of private companies is that they may remove the waste but often as has been noted they dump it elsewhere -- sometimes near Jhuggis dumps -- without looking at sanitation or and ethical concerns Thus, we need to ensure that we monitor the disposal of all human tissues/or placenta.

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### **Ratna Singh, Toxics Link, New Delhi**

Even though the operational dynamics in the rural areas are different from the urban locations, both in terms of infrastructure available and the type of training and solutions needed. However there is experience available from the field that helps us in finding solution for the rural areas.

The Bio-Medical Waste Management & Handling Rules, 1998 makes it mandatory for any healthcare establishments to Segregate Waste and ensure safe collection and treatment of waste. Under the above mentioned rule, the waste generated at the PHC can be managed by adopting the following options

#### Infectious Waste

Small clinics or PHCs which generate small volumes of waste may use an onsite waste burial pit as per the following standards

1. A pit or trench should be dug about 2 meters deep. It should be half filled with waste, and then covered with lime within 50 cm of the surface, before filling the rest of the pit with soil.
2. It must be ensured that animals do not have any access to burial sites. Covers of galvanized iron/wire meshes may be used.
3. On each occasion, when wastes are added to the pit, a layer of 10cm of soil shall be added to cover the wastes.
4. Burial must be performed under close and dedicated supervision.
5. The deep burial site should be relatively impermeable and no shallow well should be close to the site.
6. The pits should be distant from habitation, and sited so as to ensure that no contamination occurs of any surface water or ground water. The area should not be prone to flooding or erosion.
7. The location of the deep burial site will be authorized by the prescribed authority.
8. The institution shall maintain a record of all pits for deep burial.

For the treatment of infectious plastic waste the use of autoclave has been recommended by the Government. The guidelines also specify that if under certain circumstances autoclaves cannot be provided for, boiling such waste in water for at least ten minutes or chemically treatment can be imparted. However it is the responsibility of the CHC/PHC to ultimately make necessary arrangements to impart autoclaving treatment on a regular basis.

Please also see the [recent guidelines](#) issued by the Central Pollution Control Board on the management of waste generated during immunization programme. The guidelines can be referred for constructing a pit for the management of sharps waste.

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### **Farrakhan Khan, Find Your Feet, Lucknow**

The practice you've mentioned is indeed prevalent in rural India. However, it is still being followed widely in case of home based deliveries (that accounts for >70%) while the concern has

been raised in the context of institutional deliveries. Besides even organic waste (e.g. pus, blood etc.) carrying harmful pathogens (causing Hepatitis, Tuberculosis, and STDs etc.) may expose the community unless it is properly disposed.

While Department of Health has circulated guidelines for disposing sharps (needles and used auto disposable syringes) as well as has made budgetary provisions under RCH II for disposing the same at the PHCs and Sub Centers levels, the situation has not changed much down at the ground level. We need to regularly monitor and assess the situation in this context to ensure effective implementation of the bio medical waste act as per norms.

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**Pushkar Srivastava, Asian Development Bank, EMTK, Trivandrum**

Indeed a common Bio-medical Waste Disposal facility is the best option. However, the problem remains in areas that lack such a facility or when it becomes unviable for the waste disposal facility to collect biomedical waste from far off locations like PHCs. My suggestions, for such cases, is to have some skeletal infrastructure like a deep burial site, a 5kg/10kg waste autoclave, needle destroying units, some chemical disinfectant, etc. and treat and dispose the treated waste rather than indiscriminate dumping.

Waste Category 1 (such as placenta) from PHCs can be disposed into a secured deep burial site, as per the Bio-medical Wastes (Management and Handling) (Amendment) Rules, 2000, if no incineration facility is available in the hospital or nearby areas. The PHC should get a site approved for deep burial by the State Pollution Control Board and use it for Category 1 waste disposal. Care should be taken against ground water table, if it is less than 2m below the bottom of the deep burial site. This option is available only in towns with population less than five lakhs and in rural areas.

Table top Needle Destroying Units are available in the market and the prices are reasonable. The needle and syringes should be subjected to a Needle Destroying Unit, which has a single/ double slot process that incinerates the needle and cuts the nozzle.

Normally, the limited supply of medicines to PHCs gets fully consumed. Category 5 waste, if any, can be stored in a secured place and periodically transported to a secured landfill in an authorized vehicle (may be once a year or once in two years).

Soiled waste and solid waste (Waste Category 6 and 7) can be autoclaved using the waste autoclave or micro-waved.

Liquid waste and Chemical Waste (Waste Category 8 and 10) should be subjected to chemical treatment using at least 1% hypochlorite solution with a minimum contact period of 30 minutes or any other equivalent chemical reagent and then discharged into sewers / drains for liquids and secured landfill for solids. The other reagents that can be used are phenolic compounds, iodine hexachlorophene, iodine-alcohol or formaldehyde-alcohol combination, etc.

Waste Category 2 and Waste Category 9 are not likely to be generated in PHCs. The same may hold good for Waste Category 3, perhaps, in many PHCs.

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**Ramesha Gowda, Karnataka**

The scene you have witnessed need not be outcome of activities in rural area. Such things can be witnessed only around metros and mega cities like Bangalore. Some time people in Bangalore do dump such waste at the out skirts to avoid disposal costs.

As per the disposal is concerned people usually burry such waste within their premises. They have already been appraised of biomedical waste (Management and Handling) Rules through series of notices and letters.

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**Dr. K.S. Baghotia, State Programme Officer (BMW Mgmt), Delhi**

The concept of Centralized facility for treatment of biomedical waste is fully implemented throughout the country except hilly and forest areas. This cost effective and lesser polluting resulting in lesser harm to human health and environment in Delhi it is profitable and lucrative business.

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**Pallavi Patel, CHETNA, Ahmedabad**

Please Contact Dr. Shayamala Mani or Ms. Madhavi Joshi from CEE, Ahmedabad. They have developed IEC material for Hospital Waste. Their email address is [madhavi.joshi@ceeindia.org](mailto:madhavi.joshi@ceeindia.org).

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**Dr. Prasant, Abhilasha trust, Bhubaneswar**

I am a pediatrician working for MCH care in Orissa & Jharkhand for about 14 years; my clarity on BMW management has really improved due to this discussion.

I feel strongly that the NGOs working under RCH II should be oriented about the management of BMW so that they can be advocates among our health service providers at grass root for proper disposal of bio medical wastes!

Is there any agency who support such initiative!

Please guide me.

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**Prabhjot Sodhi, UNDP GEF SGP, New Delhi**

I am herewith providing information on the project – 'Educating and Training for Bio-Medical Waste Management and Handling' along with contact details of the NGO Partner,

Name of the Partner: Sadguru Shree Jivanji Maharaj Memorial Foundation

Contact Person: Mr. Snehal J. Shah

Address: 32- Mihir Park, Old Padra Road, Vadodara – 390 020

Ph No. – 0265 – 2314992; Fax: 0265 – 2354119

Title of Project: Educating and Training for Bio-Medical Waste Management and Handling

Project Objectives: The objectives of the project is to build capacities of the stakeholder communities such as Hospitals, local doctors to effectively implement the Bio-Medical waste Management System for the city of Baroda and to impart proper trainings, capacity building on

handling and segregation of Bio-medical waste and build awareness amongst the residents, shops and neighborhood.

Project Activities: The basic strategy of the project is to individually target 800 hospitals in the city and build capacities on BMW management and handling. The major activities required to achieve the project purpose are:

A. Capacity Building

- a. Intensive training of the staff of all the hospitals, clinics, dispensaries and laboratories to handle the biomedical waste (BMW) generators and on awareness on biomedical waste management, segregation and handling as per the safety norms and guidelines laid by the Pollution Control Board.
- b. Training of all the nursing staff, ward boys and Class IV staff who are directly exposed to the infectious biomedical waste in the city of Vadodara and the satellite towns. Around 5000 staff being trained over the period of 2 years. The trainings will be conducted in the local languages.
- c. Awareness campaign with 1200 doctors, senior staff, administrative staff, local government, Municipal Corporation, Pollution Control Board etc. through a series of 4 seminars.

B. Setting up Demonstration Facility: A demonstration facility is set up in 2 hospitals of minimum 10-20 beds as a model and has been extended to other three hospitals. Complete staff training carried out on segregation and handling of BMW and an operational waste management system will be set up. Tie-ups have been made with a group called Quantum Environment Engineers to use their common treatment facility for waste handling. Daily the waste is collected and passed towards safe disposal.

Routine inspection for follow-up on waste management is being linked to partner stakeholder hospitals, the group meetings are held for the constant improvement.

Community Participation:

1. The community directly involved in the project is the medical fraternity including the doctors, the nursing staff and the administrative staff. However, the benefits of the project will reach the community of the city hospitals as the hazardous biomedical waste will be prevented from getting into landfills and water bodies minimizing risks of infections.
2. There are 8 blocks in the city and organisation is running 4 vehicles on daily to collect the biomedical waste. The staff is trained in terms of collection and segregation of wastes. It was mentioned presently they touch 950 doctors as members. A base line done by the NGO as to what is the present status and how they shall act, so that clear impacts can be drawn at the end of project.

I shall provide more details on the same. Thanks.

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**Many thanks to all who contributed to this query!**

*If you have further information to share on this topic, please send it to Maternal and Child Health Community at [se-mch@solutionexchange-un.net.in](mailto:se-mch@solutionexchange-un.net.in) and Solution Exchange for WES-Net at [se-wes@solutionexchange-un.net.in](mailto:se-wes@solutionexchange-un.net.in) with the subject heading "Re: [se-mch] [se-wes] Query: Biomedical Waste Management in PHC, from Venkatesh Harvoo, Exide India, Bangalore, (Experiences). Additional Response."*

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