Health Care Waste Management in South East Asia

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Health Care Without Harm

Health Care Wastes

- Healthcare waste (HCW) is a by-product of healthcare that includes infectious, sharps, hazardous and radioactive.

Health care wastes

All waste that is generated or produced as a result of any of the following activities:

- Diagnosis, treatment, or immunization of human beings or animals;
- Research pertaining to the above activities;
- Production or testing of biologicals

Also, includes the waste originating from minor sources such as that produced in the course of health care undertaken in the home (dialysis, insulin injections, etc.)

Poor management of HCW exposes healthcare workers, patient, waste handlers, and the community to infections, toxic effects and injuries

Current situation

- Many health facilities still do not dispose health-care waste in sound and safe manner
- Open burning still practiced in many countries

Current situation

- Low awareness on the health risks from poor health care waste management among the workers
- Lack of financial resources for HCWM
- Lack of information

Incineration: Toxic Fumes


HOSPITAL
WASTE

Key drivers for HCWH

- Protection of health of both health workers, scavengers (waste pickers) and public – minimise risk and exposure
- Millions of Hepatitis B,C and HIV infections could be prevented through sound management of health care waste especially sharps
- Many of SEA member countries are party to international conventions on waste management

Key drivers of HCWM

- World Health Assembly resolution – Improvement of health through safe and environmentally sound waste management
- Human rights special report to UN General Assembly- adverse effects of dangerous products and wastes including sharps
- Appropriate and alternative technologies available

Key drivers of HCWH

- Appropriate and alternative technologies available
- HCWM piloted in few countries giving good results
- Partnerships among WHO, Governments, INGOs and NGOs




Technology issues

- Often regarded as the heart of the issue
- **Non-incineration technologies becoming mainstream**
- Many large and small scale options for infectious waste
- **Need more research on technologies for pathological waste and chemical waste**
- Take-back an option for pharmaceuticals and chemicals

Autoclaves of various shapes and sizes

- Large and small autoclaves/shredders, Hybrid autoclaves

Bondtech

Hydroclave

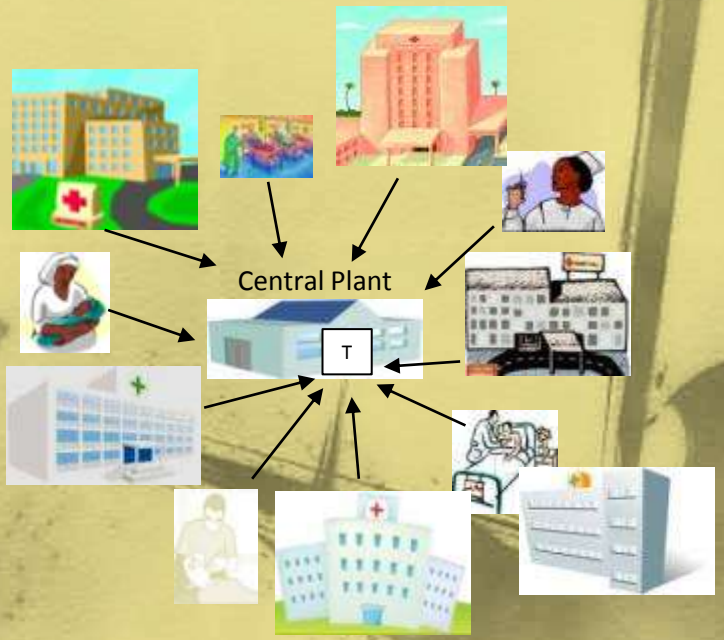
- Shivani

- Matachana

Ecodas

Treatment Approaches

- **On-site** - hospital treats its own waste
- **Cluster treatment** – hospital treats waste from health facilities in a small area
- **Central treatment** – dedicated facility collects and treats wastes from many health facilities in an urban center or region



Resource issues

- WHO core principles describe medwaste as an integral part of health system strengthening
- The safe and sustainable management of health-care waste is a public health imperative and a responsibility of all. Improper management of health-care waste poses a significant risk to patients, health-care workers, the community and the environment.
- This problem can be solved. The right investment of resources and commitment will result in a substantive reduction of disease burden and corresponding savings in health expenditures.

WORLD HEALTH ORGANIZATION

Safe health-care waste management

WHO core principles

for achieving safe and sustainable management of health-care waste

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Background

Health-care waste can cause serious harm if not managed properly. For example, in 2000, WHO estimated that injections with contaminated syringes caused 21 million hepatitis B virus (HBV) infections (32% of all new infections), two million hepatitis C virus (HCV) infections (40% of all new infections) and 260 000 HIV infections (5% of all new infections). In addition, health-care activities generate significant amounts of hazardous waste such as mercury and expired pharmaceuticals, as well as large amounts of general waste.

The management of health-care waste is an integral part of a national health-care system. A holistic approach to health-care waste management should include a clear delineation of responsibilities, occupational health and safety programs, waste minimization and segregation, the development and adoption of safe and environmentally-sound technologies, and capacity building.

Recognizing the urgency of this problem, a growing number of countries have taken initial steps to respond to this need. These include the establishment of regulatory frameworks, development of national plans, and the demonstration of innovative approaches. However, funding for health-care waste management remains very inadequate.

Recommendations:

The WHO core principles[1] require that all associated with financing and supporting health-care activities should provide for the costs of managing health-care waste. This is the duty of care. Manufactures also share a responsibility to take waste management into account in the development and sale of their products and services.

[1] These core principles were developed during the International Health Care Waste meeting hosted by WHO in Geneva on June 20 - 22, 2007.

October 2007

Funding- WHO Core Principles

Governments should:

- allocate a budget to cover the costs of establishment and maintenance of sound health-care waste management systems
- request donors, partners and other sources of external financing to include an adequate contribution towards the management of waste associated with their interventions
- implement and monitor sound health-care waste management systems, support capacity building, and ensure worker and community health.

Donors and partners should:

- include a provision in their health program assistance to cover the costs of sound healthcare waste management systems.

Non-governmental organizations should:

- undertake programs and activities that contribute to sound health-care waste management.

Poor infrastructure

- Unreliable power
- Lack of transportation:
  - No vehicles or maintenance or fuel
  - Long distances
  - Bad roads, either part od the time or all year
- No recycling markets to reclaim non-hazardous wastes/defray costs
- No proper landfills for final disposal of treated wastes

UNDP GEF Project on Healthcare Waste

Key Features of the New Technologies

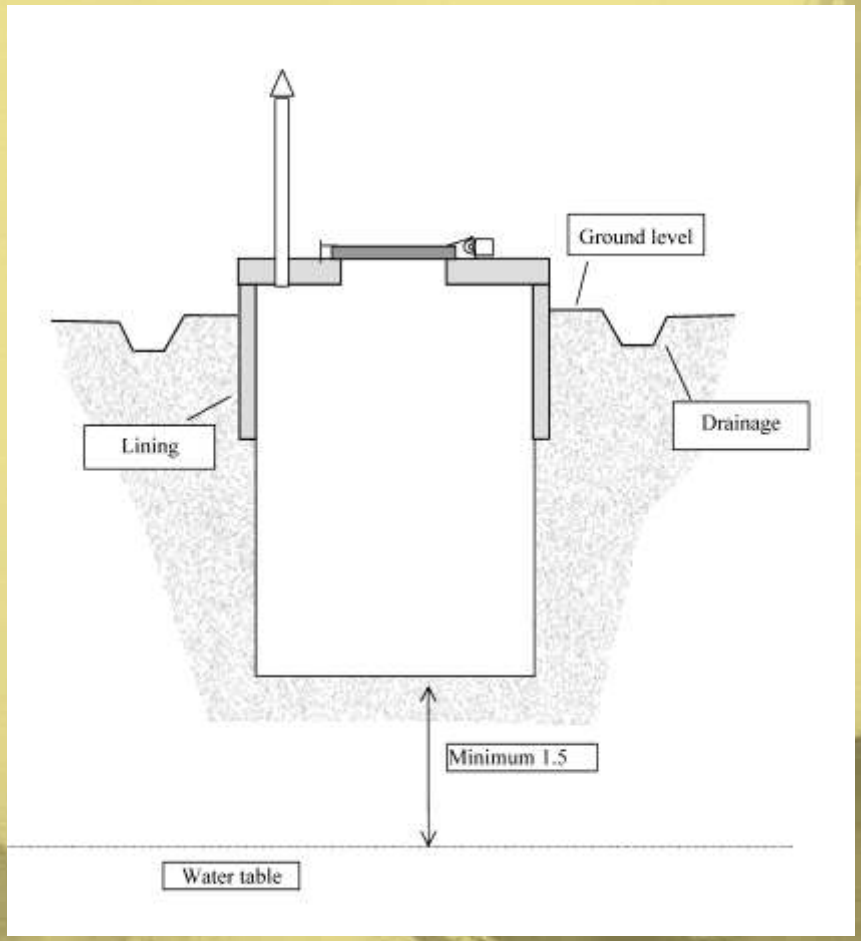
- Low-cost, modular, ergonomically designed autoclaves with multiple energy options (electricity, bottled gas, other fuels)
- Autoclavable metal waste containers that are leak-proof, colour-coded, designed for rapid steam penetration, and
  durable to last for many years
- Container stands with foot pedals to lift the container lids thus reducing cross-contamination
- Mechanical sharps destroyer or autoclavable sharps container for use with an autoclave-shredder

Key features

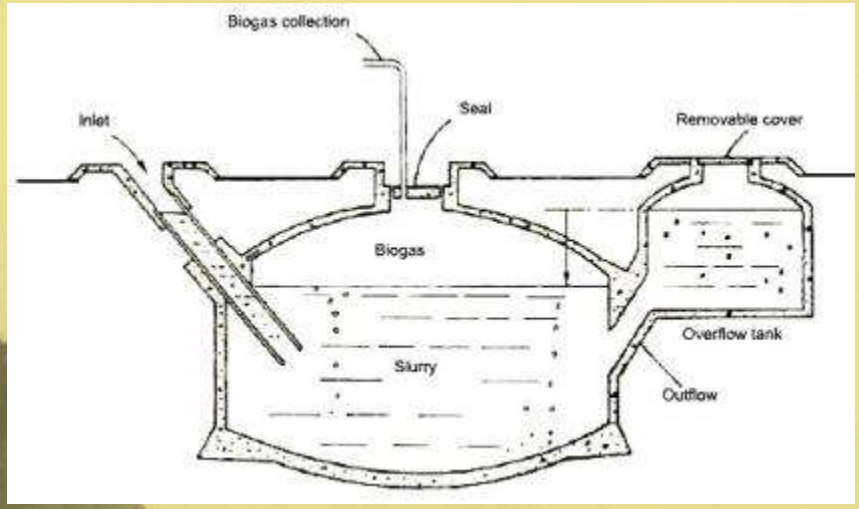
- Compactor to reduce waste volume with an integrated baler to inhibit scavenging at landfill.
- No generation of dioxins, furans and toxic metals, acid gasses, etc.
- Potential for recovery and re-melting of sterilized waste materials.
- Designed to be affordable and cost competetive with incinerator with little pollution control of the same capacity.

Think globally, act locally

- Treat as much waste on site as possible
- Tailor the solution to local conditions
- Placenta/organics pits can work well in rural areas, but they must be properly designed and more research on design and pathogen elimination is needed



Renewable energy: biogas



- Biodigestion of excreta, food waste, even pathological waste
- Also produces biogas which could be used for
  - **Cooking, lighting**
  - **Running an autoclave**
  - **Powering a fridge or laboratory equipment**
- More research needed on best design and pathogen removal

Lack of training

- Clear relationship between knowledge and good practice
- Nurses better informed than doctors
- Most workers receive little or no waste management training
- May be completely unaware of the risks
- Need also to improve understanding at the senior levels.

Lack of worker protection

- Linked to lack of training
- Poor/no PPE
- Poor vaccination
- Poor no PEP
- Lack of management support:

“This is related only to the fate of that person that has had an accident. It is not our duty to take action against their fate”

Safety programs needed

- Treat waste workers on a par with medical staff regarding training, vaccination, PPE and PEP
- Monitor practices of subcontractors, and other involved parties eg municipality and work only with those who protect their workers

Need to keep waste handling chain clean

The need for needle cutters

Almost 1/3 of waste handlers' injuries are in legs, from carrying bags with sharps in them

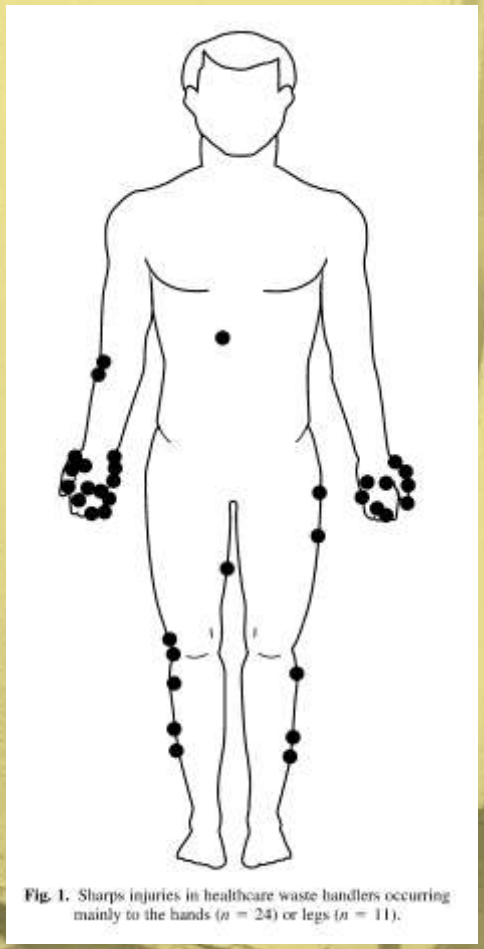


Fig. 1. Sharps injuries in healthcare waste handlers occurring mainly to the hands ($n = 24$) or legs ($n = 11$).

Blenkharn & Odd 2008

Bad and illegal practices

Inside the hospital

- Reusing syringes etc
- Failing to comply with laws on segregation and disposal
- Dumping the waste to save money rather than paying for treatment
- Selling the waste. As well as low level staff, management are alleged to be involved, take a cut of the profits

Outside the hospital

- Waste transporters sell the waste en route to the treatment centre
- Untreated waste is recycled
- Waste is washed and repacked for resale
- Enforcement officers take bribes to look the other way.

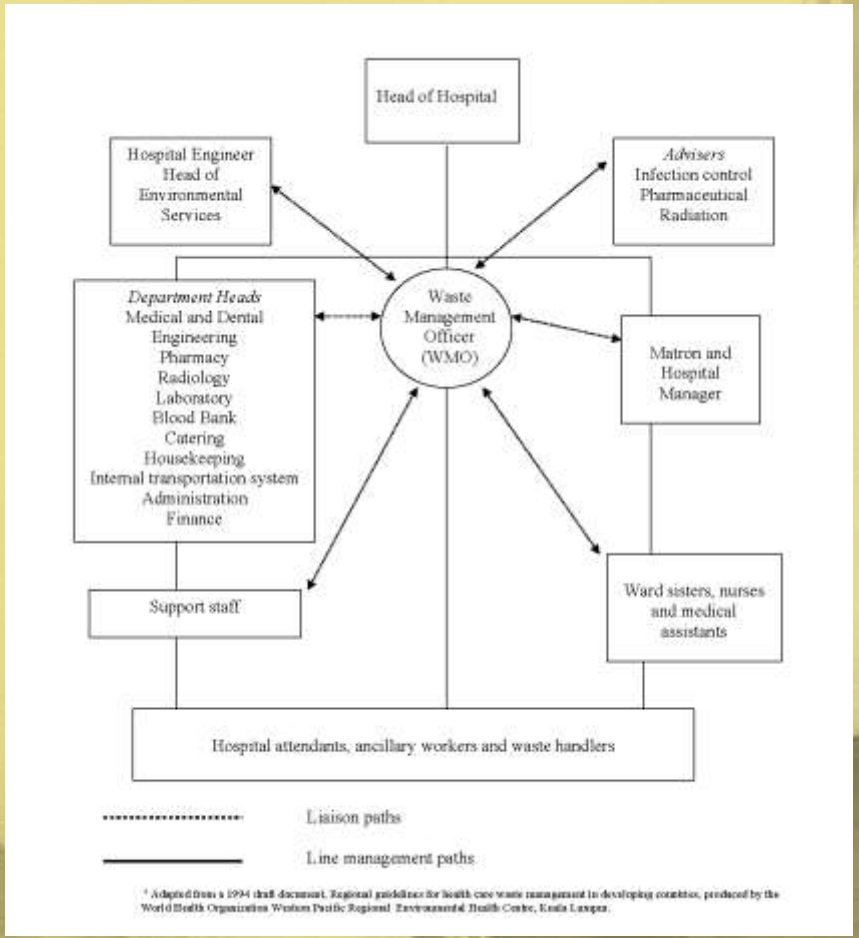
Second hand medical devices

Lack of priority, management support

- Donors and governments focus on high profile issues eg maternal health, HIV and do not give this the attention it deserves.
- Lack of research- to quantify problems and identify solutions
- Often not regarded as important by senior staff
  - **Management do not provide finance or make sure rules are enforced**
  - **Doctors notorious for not segregating, often do not attend training: claim they are "too busy"**

Proper internal management needed

- Waste management committees should:
- Include waste management in their regular workplans
- Review waste data and budgets monthly
- Ensure necessary supplies are available
- Inspect facilities weekly
- Check and enforce best practices
- Review waste management policy annually



Proper record-keeping needed

Bir Hospital **Waste data summary** **Report date** **18/08/2011**

Waste generated	Infectious waste			Recyclable waste						Other wastes	
	Infectious kg	Syringes kg	Sharps (metal) kg	Sharps (glass) kg	Glass kg	Paper kg	Plastic kg	Metal kg	Bottles and cans kg	Bio-degradable kg	Wastage inc liquids kg
Total since project start	3475	403	28	178	2799	2456	1904	19	3799	5316	7598
Daily average	9.63	1.12	0.08	0.49	7.75	6.80	5.27	0.05	10.52	14.73	41.52
Maximum	35.09	4.24	4.40	2.15	26.87	39.74	20.57	1.76	52.11	79.22	122.27
Minimum	0.14	0.02	0.00	0.00	0.00	0.13	0.03	0.00	0.37	0.83	0.00

Waste sold						Income	
	Paper (kg)	Plastic (kg)	Glass (kg)	Metal (kg)	All recyclablewaste (kg)	Value (Rs)	per bed per day (Rs)
Total since project start	2463	3696	1671	157	7987	135569.48	3.149

Statistics	All wastes kg	infectious waste kg	Recycable waste kg	Biodegradable wastes kg	Total general waste kg	% infectious waste %	Number of beds monitored number	inf waste per bed per day kg	total waste per bed per day kg	% potentially recyclable %	% actually recycled %
Total since project start	20377	3906	11155	5316	16293	19%	43057	0.091	0.473	54.7%	39.2%

Up-to-the minute summary of waste received at the treatment centre and sold.
This form is calculated automatically from data in other sheets. It is protected to prevent data entry
It has to be general categories only to allow flexibilty in other parts of the worksheet
Note that the amounts received and sold will not match because: waste was collected before the project start
Some waste that was put in the recycling bins may not be usable,
but some of the infectious waste (eg plastic from syringes) may be recyclable after treatment,
Finally, there will almost always be some waste in the centre waiting to be sold

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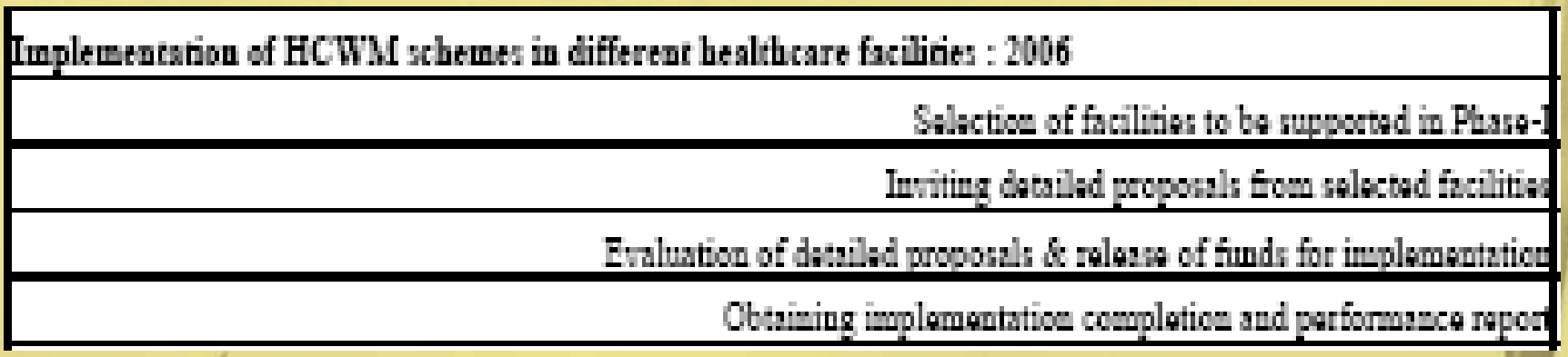
HECAF-NEPAL

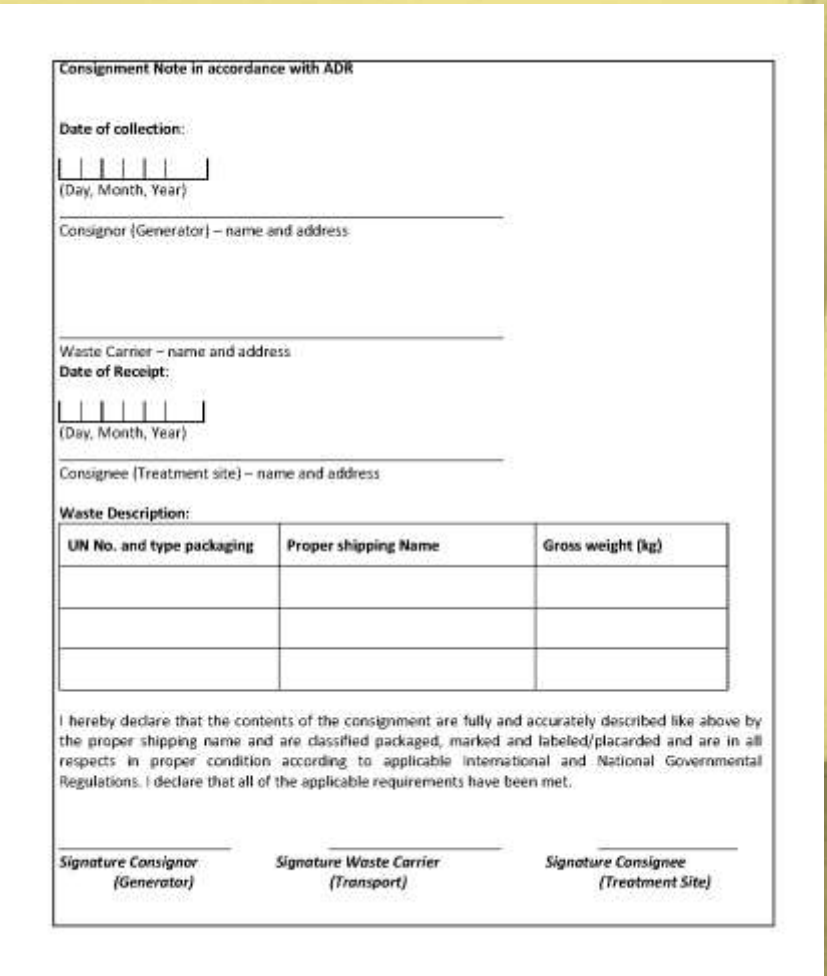
The implementation gap



- Plan: proposal, funding, reporting
- Lack of centralised support for implementation
  - Funding, training, monitoring
- Lack of experience at hampers implementation
- Need integrated strategies, partnerships

Waste tracking needed

- ADR form- international
- 4 copies needed,
  - Waste producer
  - Waste receiver
  - Transport company
  - Regulatory authority
- Tracking technologies such as bar-code labels also possible



Consignment Note in accordance with ADR

Date of collection:

(Day, Month, Year)

Consignor (Generator) – name and address

Waste Carrier – name and address

Date of Receipt:

(Day, Month, Year)

Consignee (Treatment site) – name and address

Waste Description:

UN No. and type packaging	Proper shipping Name	Gross weight (kg)

I hereby declare that the contents of the consignment are fully and accurately described like above by the proper shipping name and are classified packaged, marked and labeled/placarded and are in all respects in proper condition according to applicable International and National Governmental Regulations. I declare that all of the applicable requirements have been met.

Signature Consignor (Generator)

Signature Waste Carrier (Transport)

Signature Consignee (Treatment Site)

Addressing the challenges

- Addressing the challenge of medical waste requires involvement at all levels
- There are many possible technological solutions
- Treatment and disposal options must be tailored to the facility in question
- Adequate human and financial resources must be dedicated to waste management
- Staff must be supported as they learn new practices, and made to comply with them
- Administration, record-keeping and enforcement of rules must be strengthened at all levels

Xie Xie, Thank you

For more information

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