A problem well defined is half solved

A FACTSHEET ON

TRAINING IN HOSPITAL WASTE MANAGEMENT FOR MEDICAL STAFF

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Through our training sessions in various hospitals we realized the need for some reference training material which covers all aspects of training, but at the same time is very concise, brief and easy to use. Thus, this is an attempt to get all the important facts in a capsule.

WHAT IS THE OBJECTIVE OF TRAINING & WHO NEEDS TO BE TRAINED?

A chain is as strong as the weakest link in it, thus, not even one person in the hospital should be missed while training is given. The entire staff is involved in waste management at some point or the other, including administrators, stores personnel and other, seemingly uninvolved, departments. To ensure that the waste is carried responsibly from cradle to grave, and to see that all the material required for waste management is available to the staff, it is important to involve everyone, including:

- Doctors
- Administrators
- Nurses
- Technicians
- Ward Boys and safai karamcharis

The sessions for all of them should be taken separately, as different ideas need to be stressed upon for each category.

HOW A TRAINING SESSION SHOULD BE CONDUCTED?

Training covers the following aspects:

- Sensitization
- Teaching(Dissemination)
- Discussion & Feedback

The first session is devoted to sensitizing the audience on the need to manage waste in the hospital. In the second session, they are told about various aspects of hospital waste management like segregation, disinfection etc. The last session is taken only after the trainees have implemented the scheme for about one to two weeks in their respective areas. They are asked about the problems, if any, that they face while following the instructions given.

Training sessions should be lively; they may start on a formal note but should be made informal, and one should try to make them interactive at all stages.

Training modules should include equipment and other materials to be used later by the staff for waste management, slides on various aspects of waste management, including efforts by a hospital already following the system, slides on health effects of mismanagement of waste, etc.

Medium- As far as possible all training modules should be in the vernacular medium or the language known to the staff.

Demonstrations- Demonstrations and live acts help not only in making the training sessions lively, but also in making trainees understand things easily.
Ongoing Training: This is one of the most important components of training. Generally, the staff turnover rate in a hospital is quite high. Ongoing training ensures that the new staff knows about the scheme, besides being a continuous reminder for the old staff. These sessions thus help in sustaining the scheme.

WHO SHOULD DO THE TRAINING?

Initially, training can be done by
- Hospital person. Only a staff member who is well-versed in the subject should take the training sessions. This person should be given special time for this purpose, or else the regular duties would never leave him/her with any time to devote to the training and the issue would take a back seat.
- Outside Agency- A qualified outside agency can also be asked to train the staff. Ongoing training can be carried out under the auspices of the
  - Waste Management Committee
  - Infection Control Committee, or
  - by the Medical/ Nursing/ Sanitary Superintendents for their respective staff.

SESSION 1

It is imperative to tell people why something needs to be done. Once its importance is realized, then people are motivated to do something and make an extra effort to resolve it. Thus, sensitize the trainees by telling them about the problems associated with mismanaged hospital waste.

DANGERS TO THE COMMUNITY THROUGH BIO-MEDICAL WASTE

Spread of infection through waste

According to various surveys and reports, of the total waste generated by the hospitals only 10-15% of the waste is infectious and needs treatment. The rest of it comes under the category of general waste, which does not need any treatment. But, if all the waste is mixed, the total waste generated by a hospital becomes infectious. As the quantity of waste to be treated increases, the hospital fails to treat all its waste and a large chunk of this infectious waste reaches the municipal dumps, increasing the possibility of spreading infection.

Problems due to incinerators

Incinerator is a burn technology and is linked with problems like: i) acid gases, ii) dioxins and furans iii) and heavy metals released in air and ash

- Acid gases include nitrogen oxide, which forms acid rain and also affects the respiratory and cardiovascular system.
- Dioxins and furans are organochlorines, which form as a result of the combination of chlorine molecules in plastics (PVC) with organic material. Organochlorines mimic hormones and thus disrupt the hormonal cascades. They are proven carcinogens and endocrine disrupters, and also weaken the immune system and damage the male and female reproductive organs.
- Heavy Metals are released during incineration of medical waste. Mercury when incinerated vaporizes and spreads easily in the environment. Lead and cadmium, which are very toxic heavy metals, present in certain plastic, also accumulates in the ash, when plastic is incinerated.

Spread of infection through the recycling trade

A lot of hospital disposable items like syringes and IV bottles have been seen to enter the market again and reach the hospitals. This increases the risk of spreading infection in the community, through the ragpicker who collects it, person who repacks it, the nurse who opens it and finally the patient who gets injected. Thus, it is the duty of the nurse or any other person involved in the work to see that disposables are mutilated immediately after use to prevent their reuse.

DANGERS TO THE HEALTHCARE WORKERS

Hours spent at workplace

The healthcare workers spend a major part of their day in hospitals. Any problem here would affect them the most.

Needle stick injuries- Skin is our primary protective barrier and sharps have the ability to penetrate it. Thus a needle stick injury has a very high rate of transmitting infections. According to a study by WHO, worldwide, 8-16 million hepatitis
B, 2.3-4.7 million hepatitis C and 80,000-160,000 HIV infections are estimated to occur yearly from re-use of syringe needles without sterilization.

Another published paper gives other statistics for such injuries- (Table 6.6 and 6.7)

**DANGERS ASSOCIATED WITH MERCURY SPILLS**

Mercury is a persistent, bioaccumulative toxin. This heavy metal has the capability to bind to DNA and interfere with cell division. It is a potent neurotoxin, i.e., it attacks the central nervous system, and it can also harm other vital organs like the brain, kidney and lungs. It not only passes the skin, blood-brain but also the placental barrier. Pregnant women and children are most vulnerable to the effects of mercury. Fetuses exposed to mercury show nervous system damages. The Minamata disaster in Japan is an example of mercury poisoning via biomagnification and bioaccumulation. Mercury exposure can lead to pneumonitis, bronchitis, muscle tremors, irritability, personality changes, gingivitis and other forms of nerve damage. Some symptoms of mercury poisoning are - impairment of peripheral vision, disturbances in sensation, lack of coordination of muscles, memory loss and mental disturbances.

**BODY FLUID SPILLS**

Blood or any other body fluid, including urine or aspirations from any body part, if not cleaned up properly may lead to spread of infection in that area.

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**Table 6.6**

<table>
<thead>
<tr>
<th>Categories of hospital personnel exposed</th>
<th>Percent injured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff nurses</td>
<td>34.6%</td>
</tr>
<tr>
<td>Interns</td>
<td>15.7%</td>
</tr>
<tr>
<td>Residents</td>
<td>11.7%</td>
</tr>
<tr>
<td>Practical nurses</td>
<td>8.5%</td>
</tr>
<tr>
<td>Technical staff</td>
<td>6%</td>
</tr>
</tbody>
</table>

**Table 6.7**

<table>
<thead>
<tr>
<th>Procedures when injuries can occur</th>
<th>Number of times (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drawing blood</td>
<td>22.6%</td>
</tr>
<tr>
<td>Recapping needle</td>
<td>11%</td>
</tr>
<tr>
<td>Needle disposal</td>
<td>10.5%</td>
</tr>
<tr>
<td>Garbage disposal</td>
<td>12.5%</td>
</tr>
</tbody>
</table>

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**The New Legislation for medical waste**

The entire hospital team needs to know about the provisions under the Bio-Medical Waste (Management & Handling) Rules 1998. The reasons of how and why these came into existence should be explained so that they appreciate the usefulness of this legislation. It must also be impressed upon them that much effort would be needed from their side to make it succeed. The clauses regarding fines and other legal implications should also be dwelt upon, though the monitoring system within the hospital can be discussed at a later stage.

**INTERACTION**

Get inputs from them about waste management practices in their hospital. Ask them about what happens to different types of waste, what they think constitutes the major chunk in the waste, and how they think they can help in minimizing the waste and the risk.

**SESSION II**

Once you tell them the problems, leave the trainees for two to three days. The second meeting should focus on introducing and discussing all the aspects of waste management. Tell them in detail how a little effort on their part can help solve these problems.

- **Segregation**

The Bio-medical Waste (Management & Handling) Rules 1998 instruct the generator to segregate waste (depending on its type) in different containers. The

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rules give the categories of waste, the colour codes to be used for them and treatment options.

Segregation in a general set up would require three containers (See box)

■ **Disinfection**

Medical waste needs to be disinfected before disposal, and this can be done centrally using technologies like autoclaves, microwaves, hydroclaves etc. If disinfection has to be done at all the points of generation, then chemical disinfection is the only available option. According to the rules, 1 percent hypochlorite or any other equivalent reagent can be used for disinfecting, but it has to be ensured that chemical treatment ensures disinfection. For this the Central Sterile Supply Department (CSSD) has to follow the supplier’s directions closely.

■ **Sharps management**

Sharps constitute a special category of waste and they include needles, syringes, scalpels, blades, glass etc., which have the capability to injure by piercing the skin. As these sharps are used in patient care, there is every chance that infection can spread through this type of injury. Thus, it is necessary for all healthcare setups to have a sharps management policy.

One can handle this problem in two ways—either avoid contact with the sharp or treat it. The hospital can choose any of these ways—all sharps, including the needles can be stored in big puncture resistant containers with a small hole to discard sharps. Once this box is full, it can go for autoclaving and finally for recycling. The recycler returns the containers, which are again put to use. The second option would be to provide needle destroyers to destroy the needles and cut the syringes and then disinfect both of these in separate containers. All the other sharps can be directly put in the disinfecting solution.

■ **Mercury spill handling**

While dealing with a mercury spill the hospital workers should be ready with the following items, which can be put together in all the wards in advance and labeled as MERCURY CONTAINMENT KIT. This would ensure the availability of these things the moment the spill occurs.

- Nitrile gloves or at least two pairs of latex gloves (Mercury passes mercury can pass through single pair of latex gloves)
- Face mask
- Protection for the eyes
- Scotch Tape
- 10c.c syringe
- Covered plastic/glass container with water
- Posters depicting the process of mercury spill containment

**PRECAUTION:** Mercury-based instruments should never be used in a carpeted area.

Once a mercury spill occurs the steps to be taken are-

- Never touch mercury with bare hands, as mercury is absorbed quickly through the skin
- Remove all jewellery when dealing with mercury, as mercury combines with gold, silver and other metals.
- Clear the area around the spill and contain the spread of mercury.
- Wear all the protective gear.
- Try to gather all the small droplets of mercury with the help of two hard cardboard sheets and
then use a syringe to suck this big droplet of mercury. (Mercury is a nonwetting liquid, which has the affinity to hold to itself; thus when you get all the small drops of mercury together, they join and form a big drop).

f. Pour contents of the syringe into a plastic/ glass container with 5 to 10 ml of water.
g. Put scotch tape, if used, in the plastic/ glass container.

**Put the used syringe back in the kit, upside down.**

- **Body fluid spill**
  Cover the spill with absorbent cotton or a cloth. Discard this in the yellow or red container depending on the treatment option available. Disinfect the surface with 10% bleach for 10-15 minutes or use phenolic disinfectants.

- **Demonstrate all new material, which will be introduced in the wards.**

**SESSION III**

- **Discussing problems, answering queries**
  Once people start adopting these practices, they may face some problems and it is important to solve their problems and also discuss these together, as the other staff members who may not have faced them may also benefit. List problems from monitoring sheets.

**AWARENESS - NEED & MEANS**

These are a few ways to help a hospital spread awareness about the scheme-
- Posters and circulars,
- Hospital magazine
- Attitude survey
- Tea sessions
- Infection/ waste control committee meetings
- Hospital functions
- Evaluation of nursing stations
  Define the problem well to your staff and see how easily and efficiently they tackle it.

**Note:** This factsheet aims to highlight some basic points, which should be dealt with while training. If the reader wants to go into the details of any of the topics covered, he/ she can refer to our earlier factsheets.