

Disposal of hazardous medical waste

MOFAZZAL AHMED

MEDICAL waste is infectious waste generated in healthcare facilities and related service centers, which unless rendered safe, may be hazardous to humans and or animals coming in contact with them. Part of this waste can also be generated in residences where home treatment like dialysis and insulin administration is carried out. Many countries designate these hazardous wastes as regulated waste; and have specific regulations for its collection, transportation, treatment and disposal.

Waste generated in healthcare facilities usually contain mixtures of different types such as waste of purely municipal nature like food, packaging, waste papers, and secondary raw materials; toxic chemicals like drugs and reagents; and bio-hazardous substances like body parts, surgical instrument, contaminated bandages and dressing, post surgical waste, blood and sharps, etc. Different surveys show that about 15-25 per cent of the total waste generated in the healthcare facilities is toxic and bio-hazardous, while the rest is mostly of municipal type. Therefore, proper segregation and storage of waste at the point of source may significantly reduce the volume of medically hazardous waste. If, at the point of source, they are not properly segregated and stored, the whole lot can be contaminated, resulting in a large volume of hazardous waste-load for the treatment plants.

Bio-hazardous medical waste is a component of the total waste generated in the healthcare facilities, which are potentially risky for human health and the environment. In a broad sense, they may include: human or animal tissues, body fluids and excretions, pathological waste, human blood and blood products, used and unused sharps, animal waste, drugs and other pharmaceutical products, swabs and dressings, contaminated material, products of surgical operation and discarded surgical gloves, and toxic chemicals and reagents.

The agencies producing this medical/clinical waste are termed as generators, which include hospitals, clinics, diagnostic laboratories, medical research centres and colleges, centres for immunisation, dentist's chambers, veterinary, blood transfusion centres, residences using home-treatment, and similar other agencies. Small generators may produce less than 25 kgs of waste per month while big generators may produce several hundred or thousand kgs.

As the bio-hazardous components of the total medical waste poses potential threat to humans, animals, and the environment, their disposal should be strictly regulated. Non-bio-hazardous components can be disposed of as ordinary solid waste with less or no potential to infect humans or animals. The medical/clinical waste including sharps may also contain chemical carcinogens and or hazardous chemicals and radioactive materials, which are equally dangerous to human health.

Can we think of the risks involved in dumping medical waste in public places? The risks have equal potential for everyone. Just one prick by any of these indiscriminately disposed sharps may lead to the potential risk of transmitting the deadly HIV-AIDS. Similarly, other non-sharp waste can also cause various deadly and infectious diseases from occupational or accidental contact with them. Therefore, continued negligence in disposing of these medical wastes can one-day bring about a catastrophic disaster if not taken care of today.

Sharps constitute a special category of medical waste that include needles, syringes, lancets, scalpel blades, tubes, pipettes, glasses, instruments and tools, etc. used to puncture, cut or scrape body-parts, and or storing, testing or culturing bloods and other body fluids. They have sharp edges, corners, points or protuberances capable of punching or piercing through bags, containers and the human body during collection, transportation, and disposal. They can also punch or pierce through the body-parts of waste pickers, pedestrians, sportsman, and health conscious people practicing regular morning or evening walks.

Such sharp waste contaminated with bloods containing HIV-AIDS virus, Hepatitis-B virus or similar other deadly diseases can put many people at risk just piercing or punching through their body-parts. Some studies report that the risk of medical waste spreading HIV-AIDS is less than that of Hepatitis-B as the HIV-AIDS virus cannot survive long in a normal environment, while that of Hepatitis-B can survive up to 7 days. However, the risk is still there. To avoid the yet unknown risks, the universal precaution -- an approach to infection control that assumes that all blood and certain body fluids are infectious for HIV-AIDS, Hepatitis-B Virus, and other blood-borne pathogens, must be followed. If under certain circumstances different body fluids cannot be distinguished from each other, all body fluids should be treated as potentially infectious.

Can we think of the risks involved in dumping medical waste in public places? The risks have equal potential for everyone. Just one prick by any of these indiscriminately disposed sharps may lead to the potential risk of transmitting the deadly HIV-AIDS virus and put a person in the so-called social dustbin for the rest of his or her lifetime and finally to the grave cursed, hated, and unlamented because of the traditional belief that the primary cause of this disease is some kind of sinful act.

Similarly, other non-sharp waste can also cause various deadly and infectious diseases from occupational or accidental contact with them. Therefore, continued negligence in disposing of these medical wastes can one-day bring about a catastrophic disaster if not taken care of today.

A report with vivid photos in The Daily Star (May 10) testified to how carelessly and irresponsibly hospital waste in Bangladesh is being dumped in open places, and many hazardous components are sold for reuse. According to the report,

quoting the health ministry, there are more than 700 clinics and hospitals in Dhaka, producing an estimated 300 tons of waste a day. Since there is no system of segregation at the source, the whole lot can be termed as hazardous or infectious waste as they are mixed up. They are simply dumped in public places without any treatment.

The largest generator of this waste is perhaps the Dhaka Medical College Hospital, where Medical Assistants (Ayas) collect contaminated saline bags, syringes, and needles, and carry them in plastic bags for selling to other healthcare facilities. The report also says, it's a business controlled by some union leaders of DMCH, surely under somebody's umbrella. Nobody seems to be aware of the fact that open dumping of medical waste and reuse of the contaminated sharps carry a potentially dangerous risk for the people and the environment.

As citizens of the country, can't we expect from our learned medical experts, civil servants, politicians and law enforcement agencies a minimum sense of responsibility to protect the health and lives of the people? We can as this is our constitutional right. According to The Daily Star, DMCH bought a new incinerator three years back and installed it in a building built at a cost of Tk 27 lakhs (cost of the incinerator must be much higher). Since then, the plant has remained almost inoperative as two out of its three trays went out of order and could not be repaired because of lack of funds. More interestingly, one of the operators was a bus helper and the other was an electrician without any training. There are many examples such as these where costly equipment purchased at public expense is unable to provide the desired service because of lack of maintenance, which is again because of lack of money.

Sanitation of medical waste usually means disinfecting and sterilising the waste, which destroys the micro-organisms and their spores through physical and chemical processes so as to convert them into biologically inert materials. In many countries the safe disposal of medical waste is very important and handled in a very professional manner. They have effective systems of tracking waste generators, and follow specified regulations for segregation, collection, treatment and disposal of medical waste. The staff and people are trained in the use of separate bins and bags for different types of medical waste. At the very generation point, the waste is segregated into bio-hazardous, non-bio-hazardous, sharps, tox-

ins, pharmaceuticals, carcinogens and ordinary solid waste, etc. and stored in designated bags and bins with identification tags and or barcodes. This minimises the actual volume of potentially infectious or dangerous medical waste to almost one quarter and makes the disposal less costly and more effective.

There are technologies, which though costly, are not impossible with effort. So far the most widely used method of medical waste treatment was incineration, which in the course of time was found to be even more dangerous than the medical waste itself because of the potential risk of air pollution through emission of dioxins and other toxic gases. However, recent incineration technologies with multistage burning process and strict control of temperature, time and turbulence can significantly reduce these toxic substances; but the cost per kg of treated waste is significantly high. Therefore, many countries are now making a shift from the traditional incineration to alternative treatment methods, which are much less costly but more effective and the resultant output can be disposed of just as ordinary solid waste.

The most common alternative treatment technologies are steam sterilisation/autoclave, chemical treatment, microwave technology and stabilisation with cement (preventing migration of toxic substances to ground water or surface water). Most of these alternative technologies are more cost effective for larger healthcare facilities having more than 250 beds, dictating a central system for several medical waste generators.

Depending on the size and technology, the initial investment cost of such a unit with shredding before, after or during the sterilisation process may vary from \$100,000 to 15,000,000 with per kg cost ranging from 4-20 cents, the bigger the system the lesser the cost. Some very large units may even cost more than \$50,000,000. The volume reduction is also significant, almost 50-75 percent, requiring much less disposal cost. So, it's time for us to think over the potential hazards of medical waste and adopt appropriate policies and means to save ourselves and our future generation.

The writer is a development consultant and chairman of Muzaffar Ahmed Foundation.

The Humayun Nama: Gulbadan Begum's forgotten chronicle

YASMEEN MURSHED

THE Mughal rulers of India, like others before them, have left behind monuments to their reign in the beautiful gardens and splendid buildings dotted about the landscape of South Asia, but they also craved immortality in the pages of history. To this end they commissioned eminent historians and writers to pen the chronicles of their times.

In the case of Babar, of course, there was his own inimitable *Journal* to serve as a frank and revealing eye witness to his turbulent era, but his successors demanded more praiseful accounts from their scribes. Akbar commissioned his courtier Abul Fazl to write the well known "Akbarnama" in 1587. Probably at about the same time Gulbadan Begum, whom her translator Annette Beveridge calls "Princess Rosebody," a daughter of Babar and Humayun's sister, began to write her own account of the reigns of her father and brother. This was the *Humayun Nama*, which was first published in 1902, but a new paperback edition published by Goodword Books, India 2001, is now available.

There were apparently very few copies of this memoir and contemporary accounts or even later ones do not mention it. Annette Beveridge could find only one rather battered copy which is now in the British Museum. The Manuscript appears to be incomplete -- inextricably bound probably at a much later date, with pages missing and the last chapter out of place -- it breaks off abruptly in 1552 although historical records indicate that Gulbadan Begum died in 1608 when she was eighty years old and was buried with the respect accorded to a daughter of the founder of the dynasty.

Little known and forgotten, the memoir was found among the collection of manuscripts of the period gathered by Colonel G.W. Hamilton and sold by his widow to the British Museum in 1868. It was catalogued by the historian Dr. Rieu who declared it among the most remarkable of the Hamilton Collection of 1000 manuscripts. It remained largely unknown until 1901 when the Annette Beveridge translation, which terms it "a literary *pardah* *nashin*," brought it

to the attention of other writers and historians of the period.

Gulbadan writes simply and naturally following her father's style rather than the more ornate style of the courts of the later emperors. She begins thus, "Write down whatever you know of the doings of Firdous-Makani (Babar) and Jannat-Ashyani (Humayun). At this time when his Majesty Firdaus-Makani passed from this perishable world to the everlasting home, I, this lowly one, was eight years old, so it may well be that I do not remember much. However in obedience to the royal command, I set down whatever there is that I have heard and remember."

TALKING BOOKS

The memoir is fascinating in that it adds an authentic voice to the chronicles of those times giving intimate glimpses of the families of Babar and Humayun and an insight into early Mughal life. That it was written by a woman is extraordinary in itself, but that it is also rich in detail and balanced in tone sets it apart from other accounts of the time.

The memoir is fascinating in that it adds an authentic voice to the chronicles of those times giving intimate glimpses of the families of Babar and Humayun and an insight into early Mughal life. That it was written by a woman is extraordinary in itself, but that it is also rich in detail and balanced in tone sets it apart from other accounts of the time. The women in the narrative are not pampered princesses of a royal court but hardy women, just a little removed from their nomadic forbears. They undertook long journeys and considerable hardship, as they moved about Central Asia and North India, according to the changing fortunes of their male relatives. Humayun's flight from India with a pregnant wife, only one female to attend upon her, and a handful of male followers, closely pursued by the armies of Sher Shah, is but one example of the amazing resilience shown by these women.

Gulbadan lived her life at the behest of father, brother, or nephew, yet she retains a sense of perspective and an active understanding of the complex relationships and activities which made up her world. Indeed, it is difficult to read the memoir and keep track of personalities, relationships and events without frequent recourse to genealogical tables and charts. The Mughals were a fractious lot and the interecine wars among Babar's sons and the nobles that made up the different factions were events that the women of the family endured with patience and resignation although many of the savage and bloodthirsty actions must have caused them considerable pain. That they also retained a sense of inde-

pendence is amazing given the climate of the times, but the following story reveals that within the boundaries of familial obligations they managed to hold on to some autonomy especially when it came to marriage. This was perhaps a legacy of their nomadic past rather than the limiting restrictions which Islamisation was to impose in later years.

In her description of Humayun's marriage to Hamida-banu Begum who was to become the mother of the Great Emperor Akbar, Gulbadan writes, "The Emperor came to see her Highness, my mother (when we were encamped at Bhakkar). Shah Husain Mirza's harem and all his people paid their respects to his Majesty at this meeting. When he saw Hamida-banu Begum, his Majesty asked: 'Who is this?' They said: 'The daughter of Mir Baba Dost.'

In those days Hamida-banu Begum was often in the Mirza's residence. Another day when his Majesty came to see her Highness my mother, he remarked: 'Mir Baba Dost is related to us. It is fitting that you should give me his daughter in marriage.' On another day he came to my mother, and said: 'Send someone to call Hamida-banu Begum here.' When my mother sent the message, Hamida-banu Begum did not come, but said: 'If it is to pay my respects, I was exalted by paying my respects the other day. Why should I come again?' Another time his Majesty sent Subhan Quli, and said: 'Go to Shah Husain Mirza and tell him to send the Begam.' The Mirza said: 'Whatever I may say, she will not go. Go yourself and tell her.' When Subhan Quli went and spoke, the Begam replied: 'To see kings once is lawful; a second time it is forbidden. I shall not come.' On this Subhan Quli went and represented what she had said. His Majesty remarked: 'If she is *na mahram*, we will make her *mahram*.'

To cut the story short: For forty days the Begam resisted and discussed and disagreed. At last her Highness my mother, Dildar Begam, advised her, saying: 'After all you will marry someone. Better than a king, who is there?' And finally the Begam consented. His Majesty took the astrolabe into his own blessed hand and, having chosen a propitious hour, summoned Mir Abu'l-baqa and ordered him to make fast the marriage bond."

This anecdote, among others, is what gives vivid life to Mughal family relationships and brings these remote figures of history closer to us in emotion and feeling. How often, even today and not only in Asia but around the world, women marry because their circumstances limit choices, and marriage is seen to be the end and all of their existence. Of course very often these marriages go on to become loving relationships as did Hamida and Humayun's own marriage, but it is a gamble that women enter into often out of necessity not choice.

Yasmeen Murshed is a full-time bookworm and a part-time educationalist. She is also the founder of Scholastica School.

A tribute to Helen Keller

PARVEZ BABUL

JUNE 27, 2004 is the 124th birth anniversary of Helen Keller. Helen Keller was born near Tusculumbia, Alabama, USA on June 27, 1968. For her noble, outstanding contributions in the field of disability, June 27 is celebrated as Helen Keller Day worldwide. Helen Keller got scarlet fever at the age of 19 months that left her blind, deaf and mute. She was examined by Alexander Graham Bell (the telephone inventor) at the age of six; then he sent Anne Sullivan, a 20

years old teacher, to Helen.

With the help of dedicated teacher, Anne Sullivan, Helen learned to feel objects and associate them with words spelled out by finger signals on her palm, to read sentences by feeling raised words on cardboard and to make her own sentences by arranging words in a frame within months. She also learnt braille at the Perkins Institute. Then she began a slow process of learning to speak under Sarah Fuller of the Horace Mann School for the Deaf in Boston. She also learned to lip-read by placing her fingers on the lips and throat of the speaker while the words were simultaneously spelled out for her. She won admission to Radcliff College in 1900 and graduated *cum laude* in 1904.

Helen Keller began to write during her student life. She wrote on blindness, disabilities, social issues, demanding peace in the world, protesting war and genocide, empowerment of women and the disabled and other issues. She used to write/type the manuscript in braille, after that the manuscripts were typed with a manual typewriter. She wrote of her life in

several books, including *The Story of My Life* (at the age when Helen was only 23), *Optimism*, *The World I Live In*, *My Religion*, *Helen Keller's Journal*, and *The Open Door*. Helen Keller could speak, read and write in five languages: English, French, German, Greek, and Latin.

Helen Keller wrote in her essay that we should have four things to learn in our life. Those are:

- & In life to think clearly without hurry or confusion,
- & To love everybody sincerely,
- & To act in everything with the highest motives, and
- & Trust in dear God unhesitatingly.

When Helen was only nine years old, she wrote: "I can not see the lovely things with my eyes, but my mind can see them all and so I am joyful all the day long." At a young age Helen Keller wrote: "Every child has the right to be well-born, well-nurtured and well-taught, and only the freedom of woman can guarantee him this right." In fact, Helen Keller is well known in the whole world for her outstanding, noble contributions. This is why to work in the field of disability

we must go back to Helen Keller to devote ourselves like her.

We are really very lucky to get Helen Keller among us, but what we see when we look at the measurable condition of the disabled in our country Bangladesh? About fifteen million disabled people and most of them are being treated as second-class citizens! Disabled people are deprived from which they deserve for the lack of braille textbooks, opportunity of education, training, job, inferior mentality towards them etc. Also poverty plays a role to pull back the disabled, creates obstacles to go ahead and these causes are making them more vulnerable.

This is why we should awake up fully now and let us recognise the problems/obstacles to take necessary, time-appropriate initiatives for the disabled earlier on behalf of the government of Bangladesh, civil society, NGOs, i.e., each one of us has to take the responsibility to help at least one disabled person to be an active part like the normal people in our family, society, and the country.

The author is a columnist and freelance journalist.