

General

WHO-UNICEF-UNFPA joint statement on the use of auto-disable syringes in immunization services

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Safety boxes, puncture-proof containers - for the collection and disposal of used disposable and auto-disable syringes, needles and other injection materials - reduce the risk posed to health staff and the general public by contaminated needles and syringes.

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WHO and UNICEF recommend that:

Used auto-disable syringes should be deposited in safety boxes without re-capping, burned locally and the remains buried underground - until improved disposal methods are developed.

Safe health-care waste management (WHO policy paper)

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WHO has established tolerable intake limits for dioxins and furans, but not for emissions. The latter must be set within the national context.

Immunization in practice: a practical resource guide for Health workers 2004 update_____Module 6: Holding an immunization session

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Vials and rubbish should be wrapped in newspaper or other paper. If your local government does not collect them, either bury or burn them.

Immunization in practice: a practical resource guide for Health workers 2004 update_____Module 4: Ensuring safe injections

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Dispose of the needle and syringe in a safety box: a leak-proof, punctureresistant container for sharps waste.

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After use, the prefilled AD devices should be collected in a safety box for final disposal. (Do not re-shield.)

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All used injection equipment except reusable syringes and needles should be placed in a safety box immediately after use. These containers are waterproof and tamper-proof and needles cannot easily pierce them. If a safety box is not available, you can use locally available materials to create a functional and safe sharps container.

When the box is not in use, close the opening on the top.

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Health workers can use strong cardboard boxes, thick plastic containers, or metal cans to collect syringes and needles and transport them to a site where they can be buried or burned. Do not reuse the same can or container after filling it once. Instead, destroy the container when it is three-quarters full and find a new container for your next session.

Used syringes and needles must NEVER be dumped in open areas where people might step on them or children might find them. They should never be disposed of along with other kinds of waste.

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Following the immunization session or when the safety box is three-quarters full, close the container.

Do not transfer used syringes and needles from safety boxes to other containers.

A five litre safety box can hold about 100 syringes and needles. When three quarters full, it should be destroyed as close as possible to the immunization session site, and as soon after the session as is practical.

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Never put the following material in a safety box. Discard them with other medical waste:

- empty vials;
- discarded vaccine vials;
- cotton pads;
- compressors;
- dressing material;
- IV bags or extension tubes;
- latex gloves; or
- any kind of plastic materials or waste products.

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Any selected method of waste disposal must comply with national and subnational environmental regulations and with specific Ministry of Health instructions for your health centre.

Five methods are commonly used to destroy filled safety boxes or to keep them away from people.

1. Incineration
2. Burning in a metal drum
3. Open burning in a pit: Open burning in a pit is not always recommended because burning plastic is not good for the environment.
4. Encapsulation
5. Buried in a disposal pit

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The remains of the needles and safety box should be buried after burning, whether burning is done in a metal drum or in an open pit. Bury them deeply in a pit latrine, controlled landfill, or a similar location where people do not have access to them.

Best infection control practices for intradermal, subcutaneous, and intramuscular needle injections

[WHO Bulletin 2003, vol. 81, 7, pp 491-500](#)

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WHO defines a safe injection as one that does not harm the recipient, does not expose the provider to any avoidable risk, and does not result in waste that is dangerous to other people.

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Collect used syringes and needles at the point of use in an enclosed sharps container that is puncture-proof and leak-proof and that is sealed before it is completely full.

Seal sharps containers for transport to a secure area in preparation for disposal. After closing and sealing sharps containers, do not open, empty, reuse, or sell them. Manage sharps waste in an efficient, safe, and environment-friendly way to protect people from voluntary and accidental exposure to used injection equipment.

Procuring Single-use Injection Equipment and Safety Boxes: A Practical Guide for Pharmacists, Physicians, Procurement Staff and Programme Managers

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To prevent injection-associated infections, safe injection practices are required and injection overuse must be reduced. Firstly, patients and health care workers need to move away from unsafe and/or unnecessary injections and toward oral medications. Secondly, single-use injection equipment must be available continuously in sufficient quantities to eliminate the reuse of syringes and needles in the absence of sterilization. Thirdly, sharps waste must be managed to eliminate the risks of reuse of dirty needles and needle-stick injuries.

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Sharps waste management is an important part of a policy for the safe and appropriate use of injections. Ensuring that safety boxes are provided by the procurement system assists broader waste management plans managed by general health services.

(From Appendix 1, page 26) The efficient, safe and environmentally-friendly management of sharps waste is the only means of ensuring that single-use syringes and needles are not reused and do not lead to needle-stick injuries (17). Thus, it is important to include in the policy a statement specifying that disposal is part of the syringe life cycle and that health care services have a duty to manage sharps waste.

The management of sharps waste must be considered within the broader context of health care waste management. Implemented as such, sharps waste management will be cheaper and more sustainable. Key elements of health care waste management are summarized in the WHO health care waste management "Aide Memoire" (18) and in the WHO injection safety planner. For practical purposes, general health care services are in the best position to implement sharps waste management from a sector-wide perspective. However, to coordinate sharps waste management activities stakeholders in charge of injection equipment procurement will liaise with general health care services and purchase safety boxes as a first step of appropriate sharps collection and disposal, while new technologies are being evaluated such as used needle remover devices and needle cutters which aim to reduce the volume of sharps waste.

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Waste management plan should include:

- waste operators wear protective clothes (thick gloves, boots, trousers or apron, long sleeve shirt)
- washing facilities for personal hygiene (minimum: soap and water for hand hygiene)
- a response system for accidental injuries
- storage and waste treatment areas are restricted to authorised personnel
- immediate replacement of used bags and containers when 3/4 full

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Waste segregation and packaging

Always segregate sharps from non-sharps at the source

Immediately after use, discard entire syringe with needle into a safety box without recapping needles

Put the safety boxes into plastic bags closed hermetically when full to avoid any leakage during transportation. Mark the bag clearly.

Put empty vials into waste containers with plastic lining to avoid leakage.

Seal and mark it clearly when full

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Waste treatment and final disposal

In health-care facilities (located in low density populated area):

Sharps boxes and containers (of empty / expired vials): on-site incineration in (brick) incinerator or secure on-site burial.

On-site burning in a drum can be a suitable option if there is no incinerator.

Empty or expired vials if collected separately should be crushed before burning otherwise they can explode. They can also be disinfected with chlorine then recycled.

In health-care facilities (located in high density populated area):

Sharps boxes and containers (of empty / expired vials): off-site transportation to larger centre with treatment facility, municipal incinerator or to sanitary landfill after disinfection.

In provisional or mobile settings:

Always ensure off-site transportation of all wastes to the health centre of reference for treatment. Label the wastes, use adequate registering and delivery forms and store in secure area

On-site treatment / disposal should be avoided as much as possible

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When the sharps safety box is 3/4 full, put it aside and make sure that waste handlers close, seal it with adhesive tape and mark it before putting it in a plastic bag.

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Once (waste container is) nearly full, put it aside and make sure that waste handlers close, seal it with adhesive tape and mark it before taking it away to the storage or disposal area

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Sharp boxes:

When a plastic bag is 3/4 full, close it, seal it with adhesive tape and mark it.

Place plastic bags carefully in the storage area or take them to the disposal system if ready to process waste immediately

Infectious non-sharps: empty and expired vials:

When a waste container is 3/4 full, close it carefully, seal it with adhesive tape and mark it according to instructions given

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The best environmental option for pharmaceutical destruction is purpose-built high temperature incineration with adequate flue gas cleaning.

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A local task force or advisory committee should be established at an early stage (of disposal of unwanted pharmaceuticals in and after emergencies) to assess, analyse and address the problem of drug disposal, and to monitor activities. Furthermore, it is suggested that such a task force has a maximum of five members and that meetings are held as near to the site of the stockpile as possible.

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Administrative and regulatory procedures concerning safe disposal of pharmaceuticals, that are in line with national drug and environment legislation, should be adopted and implemented in countries that receive drug donations.

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All workers (disposing of pharmaceuticals) should wear appropriate protective equipment including overalls and boots at all times, and gloves, masks and caps when appropriate.

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If, as a last resort, pharmaceuticals must be discarded direct to a landfill then they must be covered immediately with a large quantity of municipal waste.

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Burning pharmaceuticals at low temperatures or in open containers results in release of toxic pollutants into the air. Ideally this should be avoided.

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The public should be informed about the problem of safe disposal of donated expired pharmaceuticals.

(D)isposal of pharmaceuticals should be carried out under the supervision of regional and national authorities, who organize it according to strict criteria; it must not be carried out by individuals.

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Wherever practical the possibility of returning unusable drugs for safe disposal by the manufacturer should be explored; particularly drugs which present disposal problems,

However, expired or spoiled pharmaceuticals are considered as hazardous waste and as such, if transferred across frontiers, become regulated and subject to the Basel Convention on the Transfrontier Shipment of Hazardous Wastes (7,8,9.)

7. Secretariat of the Basel Convention No. 97/012. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 1998 and Decisions Adopted by the First (1992), Second (1994) and Third (1995) Meetings of the Conferences of the Parties (September 1997).

8. Full text of the Basel Convention No 97/012 available from URL: <http://www.unep.ch/sbc/baselcon.html>

9. Manual on implementation. Basel Convention No 97/012 available from URL: <http://www.unep.ch/sbc/manual.html>

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Untreated waste discharged into an uncontrolled, non-engineered open dump does not protect the local environment and should not be used. Discarding of untreated waste pharmaceuticals into such a site is not recommended except as a last resort. They should preferably be discharged after immobilization by encapsulation or inertization. As a last resort, where it is not possible to immobilize the waste pharmaceuticals, then the untreated wastes must be covered rapidly with large quantities of municipal waste to prevent scavenging.

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(An engineered landfill) has some features to protect from loss of chemicals into the aquifer. Direct deposit of pharmaceuticals is second best to discharging immobilized pharmaceutical waste into such a landfill.

Properly constructed and operated landfill sites ("highly engineered sanitary landfill") offer a relatively safe disposal route for municipal solid wastes, including waste pharmaceuticals.

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Some liquid pharmaceuticals, e.g. syrups and intravenous (IV) fluids, can be diluted with water and flushed into the sewers in small quantities over a period of time without serious public health or environmental affect. Fast flowing watercourses may likewise be used to flush small quantities of well-diluted liquid pharmaceuticals or antiseptics.

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Pharmaceuticals should not be destroyed by burning at low temperature in open containers, as toxic pollutants may be released into the air. Paper and cardboard packaging, if they are not to be recycled, may be burnt. Polyvinyl chloride (PVC) plastic however must not be burnt. While burning pharmaceutical waste is not advocated as a method of disposal, it is recognized that it is not infrequently used. It is strongly recommended that only very small quantities of waste pharmaceuticals be disposed of in this way.

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In emergency situations the responsible authorities may consider it acceptable to treat expired solid form pharmaceuticals using a two-chamber incinerator that operates at the minimum temperature of 850C, with a combustion retention time of at least two seconds in the second chamber. In this case, it is recommended that the pharmaceutical waste is diluted with large quantities of municipal waste (approximately 1:1000).

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Cement kilns are particularly suited for the disposal of expired pharmaceuticals. It is recommended that discussions be held with cement companies and the appropriate environmental agencies to arrange for waste to be disposed of using a cement kiln.

Pharmaceuticals should be introduced into the furnace as a reasonably small proportion of the total fuel feed. It is suggested that as a sensible "rule of thumb" no more than 5% of the fuel fed into the furnace at any one time is pharmaceutical material.

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If an appropriate incinerator is not available, the option of chemical decomposition can be used in accordance with the manufacturer's recommendations, followed by landfill. This method is not recommended unless chemical expertise is readily available.

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Pharmaceuticals that should never be used and should always be considered as pharmaceutical waste are: all cold chain damaged unexpired pharmaceuticals that should have been stored in a cold chain but were not (for example: insulin, polypeptide hormones, gamma globulins and vaccines);

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Small quantities of solid and semi-solid pharmaceuticals, typically not more than 1% of the total daily waste, can be disposed of directly in a landfill with large volumes of municipal solid waste, if no other suitable method is available.

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_Small quantities of other liquid pharmaceuticals, which are not controlled substances, antiinfective drugs, or antineoplastics, can be flushed into sewers. If there are no sewers or there is no functioning sewage treatment plant, liquid pharmaceuticals can be first diluted with large volumes of water and poured into large watercourses, providing they are immediately dispersed and diluted by the flowing river water.

_Liquid pharmaceutical waste may be disposed of using the cement encapsulation procedure, high temperature incineration or in cement kilns. It is not acceptable to discharge liquid pharmaceuticals, diluted or not, into slow moving or stagnant surface waters.

_Ampoules can be crushed on a hard impermeable surface (e.g. concrete) or in a metal drum or bucket using a stout block of wood or a hammer. Workers doing this should wear protective equipment, such as eye protection, boots, clothing and gloves. The crushed glass should be swept up, placed in a container suitable for sharp objects, sealed and disposed of in a landfill. The liquids released from the ampoules should be diluted and disposed of as described above. Ampoules should not be burnt or incinerated as they will explode, possibly causing injury to operators and damage to the furnace or incinerator.

'First, do no harm' Introducing auto-disable syringes and ensuring injection safety in immunization systems of developing countries

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Each immunization programme must assess local conditions and find appropriate waste disposal solutions. Any selected method of waste disposal must be in compliance with national and subnational environmental regulations.

'First, do no harm' Introducing auto-disable syringes and ensuring injection safety in immunization systems of developing countries

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In rural areas where groundwater is not shallow and when volume is not a primary concern, burial/encapsulation can be a good interim method of disposal. These methods are simple, low-cost, safe and friendly to the environment.

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When possible, the use of burial/encapsulation is often a better option for rural health facilities. On the other hand, low temperature burning may be a reasonable and practical short-term solution for safely disposing of used needles and syringes generated during mass immunization campaigns or for small rural health facilities.

'First, do no harm' Introducing auto-disable syringes and ensuring injection safety in immunization systems of developing countries

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Currently, WHO has not tested or recommended the use of syringe melting ovens and evaluation of this technology is still in progress.

Managing an injection safety policy

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Health care waste management plan (should be) established within the health care system.

Safe health-care waste management (WHO policy paper)

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In view of the challenge represented by health-care waste and its management, WHO activities are oriented by the following guiding principles:

- preventing the health risks associated with exposure to health-care waste for both health workers and the public by promoting environmentally sound management policies for health-care waste;
- supporting global efforts to reduce the amount of noxious emissions released into the atmosphere to reduce disease and defer the onset of global change;
- supporting the Stockholm Convention on Persistent Organic Pollutants (POPs);
- supporting the Basel Convention on hazardous and other waste; and
- reducing the exposure to toxic pollutants associated with the combustion process through the promotion of appropriate practices for high temperature incineration.

Safe health-care waste management (WHO policy paper)

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To better understand the problem of health-care waste management, WHO guidance recommends that countries conduct assessments prior to any decision as to which health-care management methods be chosen. WHO proposes to work in collaboration with countries through the following strategies:

Short-term

- Production of all syringe components made of the same plastic to facilitate recycling;
- selection of PVC-free medical devices;
- identification and development of recycling options wherever possible (e.g.: for plastic, glass, etc.); and
- research and promotion on new technology or alternative to small-scale incineration;

Until countries in transition and developing countries have access to health-care waste management options that are safer to the environment and health, incineration may be an acceptable response when used appropriately. Key elements of appropriate operation of incinerators include effective waste reduction and waste segregation, placing incinerators away from populated areas, satisfactory engineered design, construction following appropriate dimensional plans, proper operation, periodic maintenance, and staff training and management.

Medium-term

- Further efforts to reduce the number of unnecessary injections to reduce the amount of hazardous health-care waste that needs to be treated;
- research into the health effect of chronic exposure to low levels of dioxin and furan; and
- risk assessment to compare the health risks associated with: (1) incineration; and (2) exposure to health-care waste.

Long-term

- Effective, scaled-up promotion of non-incineration technologies for the final disposal of health-care waste to prevent the disease burden from: (a) unsafe health-care waste management; and (b) exposure to dioxins and furans;
- support to countries in developing a national guidance manual for sound management of health-care waste;
- support to countries in the development and implementation of a national plan, policies and legislation on health-care waste;
- promotion of the principles of environmentally sound management of health-care waste as set out in the Basel Convention; and
- support to allocate human and financial resources to safely manage health-care waste in countries.

Policy

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- washing facilities for personal hygiene (minimum: soap and water for hand hygiene)
- a response system for accidental injuries
- storage and waste treatment areas are restricted to authorised personnel
- immediate replacement of used bags and containers when 3/4 full

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Waste segregation and packaging

Always segregate sharps from non-sharps at the source
Immediately after use, discard entire syringe with needle into a safety box without recapping needles
Put the safety boxes into plastic bags closed hermetically when full to avoid any leakage during transportation. Mark the bag clearly.
Put empty vials into waste containers with plastic lining to avoid leakage.
Seal and mark it clearly when full

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Waste treatment and final disposal

In health-care facilities (located in low density populated area):

Sharps boxes and containers (of empty / expired vials): on-site incineration in (brick) incinerator or secure on-site burial.

On-site burning in a drum can be a suitable option if there is no incinerator. Empty or expired vials if collected separately should be crushed before burning otherwise they can explode. They can also be disinfected with chlorine then recycled.

In health-care facilities (located in high density populated area):

Sharps boxes and containers (of empty / expired vials): off-site transportation to larger centre with treatment facility, municipal incinerator or to sanitary landfill after disinfection.

In provisional or mobile settings:

Always ensure off-site transportation of all wastes to the health centre of reference for treatment. Label the wastes, use adequate registering and delivery forms and store in secure area

On-site treatment / disposal should be avoided as much as possible

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When the sharps safety box is 3/4 full, put it aside and make sure that waste handlers close, seal it with adhesive tape and mark it before putting it in a plastic bag.

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Once (waste container is) nearly full, put it aside and make sure that waste handlers close, seal it with adhesive tape and mark it before taking it away to the storage or disposal area

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Sharp boxes:

When a plastic bag is 3/4 full, close it, seal it with adhesive tape and mark it.

Place plastic bags carefully in the storage area or take them to the disposal system if ready to process waste immediately

Infectious non-sharps: empty and expired vials:

When a waste container is 3/4 full, close it carefully, seal it with adhesive tape and mark it according to instructions given

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The best environmental option for pharmaceutical destruction is purpose-built high temperature incineration with adequate flue gas cleaning.

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A local task force or advisory committee should be established at an early stage (of disposal of unwanted pharmaceuticals in and after emergencies) to assess, analyse and address the problem of drug disposal, and to monitor activities. Furthermore, it is suggested that such a task force has a maximum of five members and that meetings are held as near to the site of the stockpile as possible.

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Administrative and regulatory procedures concerning safe disposal of pharmaceuticals, that are in line with national drug and environment legislation, should be adopted and implemented in countries that receive drug donations.

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All workers (disposing of pharmaceuticals) should wear appropriate protective equipment including overalls and boots at all times, and gloves, masks and caps when appropriate.

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If, as a last resort, pharmaceuticals must be discarded direct to a landfill then they must be covered immediately with a large quantity of municipal waste.

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Burning pharmaceuticals at low temperatures or in open containers results in release of toxic pollutants into the air. Ideally this should be avoided.

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The public should be informed about the problem of safe disposal of donated expired pharmaceuticals.

(D)isposal of pharmaceuticals should be carried out under the supervision of regional and national authorities, who organize it according to strict criteria; it must not be carried out by individuals.

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Wherever practical the possibility of returning unusable drugs for safe disposal by the manufacturer should be explored; particularly drugs which present disposal problems,

However, expired or spoiled pharmaceuticals are considered as hazardous waste and as such, if transferred across frontiers, become regulated and subject to the Basel Convention on the Transfrontier Shipment of Hazardous Wastes (7,8,9.)

7. Secretariat of the Basel Convention No. 97/012. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 1998 and Decisions Adopted by the First (1992), Second (1994) and Third (1995) Meetings of the Conferences of the Parties (September 1997).

8. Full text of the Basel Convention No 97/012 available from URL:
<http://www.unep.ch/sbc/baselcon.html>

9. Manual on implementation. Basel Convention No 97/012 available from URL: <http://www.unep.ch/sbc/manual.html>

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Untreated waste discharged into an uncontrolled, non-engineered open dump does not protect the local environment and should not be used. Discarding of untreated waste pharmaceuticals into such a site is not recommended except as a last resort. They should preferably be discharged after immobilization by encapsulation or inertization. As a last resort, where it is not possible to immobilize the waste pharmaceuticals, then the untreated wastes must be covered rapidly with large quantities of municipal waste to prevent scavenging.

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(An engineered landfill) has some features to protect from loss of chemicals into the aquifer. Direct deposit of pharmaceuticals is second best to discharging immobilized pharmaceutical waste into such a landfill.

Properly constructed and operated landfill sites ("highly engineered sanitary landfill") offer a relatively safe disposal route for municipal solid wastes, including waste pharmaceuticals.

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Some liquid pharmaceuticals, e.g. syrups and intravenous (IV) fluids, can be diluted with water and flushed into the sewers in small quantities over a period of time without serious public health or environmental affect. Fast flowing watercourses may likewise be used to flush small quantities of well-diluted liquid pharmaceuticals or antiseptics.

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Pharmaceuticals should not be destroyed by burning at low temperature in open containers, as toxic pollutants may be released into the air. Paper and cardboard packaging, if they are not to be recycled, may be burnt. Polyvinyl chloride (PVC) plastic however must not be burnt. While burning pharmaceutical waste is not advocated as a method of disposal, it is recognized that it is not infrequently used. It is strongly recommended that only very small quantities of waste pharmaceuticals be disposed of in this way.

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In emergency situations the responsible authorities may consider it acceptable to treat expired solid form pharmaceuticals using a two-chamber incinerator that operates at the minimum temperature of 850C, with a combustion retention time of at least two seconds in the second chamber. In this case, it is recommended that the pharmaceutical waste is diluted with large quantities of municipal waste (approximately 1:1000).

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Cement kilns are particularly suited for the disposal of expired pharmaceuticals. It is recommended that discussions be held with cement companies and the appropriate environmental agencies to arrange for waste to be disposed of using a cement kiln.

Pharmaceuticals should be introduced into the furnace as a reasonably small proportion of the total fuel feed. It is suggested that as a sensible "rule of thumb" no more than 5% of the fuel fed into the furnace at any one time is pharmaceutical material.

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If an appropriate incinerator is not available, the option of chemical decomposition can be used in accordance with the manufacturer's recommendations, followed by landfill. This method is not recommended unless chemical expertise is readily available.

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Pharmaceuticals that should never be used and should always be considered as pharmaceutical waste are: all cold chain damaged unexpired pharmaceuticals that should have been stored in a cold chain but were not (for example: insulin, polypeptide hormones, gamma globulins and vaccines);

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Small quantities of solid and semi-solid pharmaceuticals, typically not more than 1% of the total daily waste, can be disposed of directly in a landfill with large volumes of municipal solid waste, if no other suitable method is available.

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_Small quantities of other liquid pharmaceuticals, which are not controlled substances, antiinfective drugs, or antineoplastics, can be flushed into sewers. If there are no sewers or there is no functioning sewage treatment plant, liquid pharmaceuticals can be first diluted with large volumes of water and poured into large watercourses, providing they are immediately dispersed and diluted by the flowing river water.

_Liquid pharmaceutical waste may be disposed of using the cement encapsulation procedure, high temperature incineration or in cement kilns. It is not acceptable to discharge liquid pharmaceuticals, diluted or not, into slow moving or stagnant surface waters.

_Ampoules can be crushed on a hard impermeable surface (e.g. concrete) or in a metal drum or bucket using a stout block of wood or a hammer. Workers doing this should wear protective equipment, such as eye protection, boots, clothing and gloves. The crushed glass should be swept up, placed in a container suitable for sharp objects, sealed and disposed of in a landfill. The liquids released from the ampoules should be diluted and disposed of as described above. Ampoules should not be burnt or incinerated as they will explode, possibly causing injury to operators and damage to the furnace or incinerator.

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Each immunization programme must assess local conditions and find appropriate waste disposal solutions. Any selected method of waste disposal must be in compliance with national and subnational environmental regulations.

'First, do no harm' Introducing auto-disable syringes and ensuring injection safety in immunization systems of developing countries

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In rural areas where groundwater is not shallow and when volume is not a primary concern, burial/encapsulation can be a good interim method of disposal. These methods are simple, low-cost, safe and friendly to the environment.

'First, do no harm' Introducing auto-disable syringes and ensuring injection safety in immunization systems of developing countries

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When possible, the use of burial/encapsulation is often a better option for rural health facilities. On the other hand, low temperature burning may be a reasonable and practical short-term solution for safely disposing of used needles and syringes generated during mass immunization campaigns or for small rural health facilities.

'First, do no harm' Introducing auto-disable syringes and ensuring injection safety in immunization systems of developing countries

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Currently, WHO has not tested or recommended the use of syringe melting ovens and evaluation of this technology is still in progress.

Managing an injection safety policy

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Health care waste management plan (should be) established within the health care system.

Safe health-care waste management (WHO policy paper)

page 2

In view of the challenge represented by health-care waste and its management, WHO activities are oriented by the following guiding principles:

- preventing the health risks associated with exposure to health-care waste for both health workers and the public by promoting environmentally sound management policies for health-care waste;
- supporting global efforts to reduce the amount of noxious emissions released into the atmosphere to reduce disease and defer the onset of global change;
- supporting the Stockholm Convention on Persistent Organic Pollutants (POPs);
- supporting the Basel Convention on hazardous and other waste; and
- reducing the exposure to toxic pollutants associated with the combustion process through the promotion of appropriate practices for high temperature incineration.

Safe health-care waste management (WHO policy paper)

page 2

To better understand the problem of health-care waste management, WHO guidance recommends that countries conduct assessments prior to any decision as to which health-care management methods be chosen. WHO proposes to work in collaboration with countries through the following strategies:

Short-term

- Production of all syringe components made of the same plastic to facilitate recycling;
- selection of PVC-free medical devices;
- identification and development of recycling options wherever possible (e.g.: for plastic, glass, etc.); and
- research and promotion on new technology or alternative to small-scale incineration;

Until countries in transition and developing countries have access to health-care waste management options that are safer to the environment and health, incineration may be an acceptable response when used appropriately. Key elements of appropriate operation of incinerators include effective waste reduction and waste segregation, placing incinerators away from populated areas, satisfactory engineered design, construction following appropriate dimensional plans, proper operation, periodic maintenance, and staff training and management.

Medium-term

- Further efforts to reduce the number of unnecessary injections to reduce the amount of hazardous health-care waste that needs to be treated;
- research into the health effect of chronic exposure to low levels of dioxin and furan; and
- risk assessment to compare the health risks associated with: (1) incineration; and (2) exposure to health-care waste.

Long-term

- Effective, scaled-up promotion of non-incineration technologies for the final disposal of health-care waste to prevent the disease burden from: (a) unsafe health-care waste management; and (b) exposure to dioxins and furans;
- support to countries in developing a national guidance manual for sound management of health-care waste;
- support to countries in the development and implementation of a national plan, policies and legislation on health-care waste;
- promotion of the principles of environmentally sound management of health-care waste as set out in the Basel Convention; and
- support to allocate human and financial resources to safely manage health-care waste in countries.