MODULE 12 | BUILDINGS, UTILITIES, WASTE AND WORKPLACE SAFETY

Healthcare Waste: Segregation, Handling and Safe Disposal

Practical hospital governance in Punjab, Pakistan

50

LECTURE

Control waste from the point of generation to the documented final disposal.

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SELF-STUDY PDF

Follow the waste to its final destination

A clean ward is only one part of waste safety. The Medical Superintendent needs evidence that every waste stream is contained, moved, treated and accounted for.

- Know the Punjab duties and source of authority.
- Prevent mixing and protect waste handlers.
- Check the contractor and final disposal route.
- Use records and inspections to find failures.

OFFICIAL SOURCE

A principle tied to a named law, standard or official guidance.

WORKING METHOD

A practical control or teaching format to adapt to the authorised system.

TEACHING CASE

An invented hospital example, used to practise applying the correct process.

Study output

A waste-system review with a checked waste trail, a contingency plan and named actions.

Module 12 | Presentation 2 of 3. Allow 45-60 minutes with exercises. All explanations are on the pages; check the cited sources before live use.

Use the correct Punjab framework

The 2014 Punjab rules govern this lecture. Do not substitute a colour chart or legal duty from another country or province.

Punjab requirements

- Rule 3 makes each public or private hospital responsible for its waste through final disposal. Sending it outside the gate does not end that duty.
- Punjab Healthcare Commission (PHC) indicators 88-89 expect a waste plan, the required team, suitable facilities and supplies, and trained staff.

How to use other sources

- Apply Environmental Protection Agency (EPA) authorisations and current orders. Radioactive waste also falls under Pakistan Nuclear Regulatory Authority (PNRA) control.
- World Health Organization (WHO) publications support technical decisions. They do not grant permission for a treatment plant, contractor or disposal route.

Keep the applicable legal texts, current authorisations and institutional procedures together.

Sources: **W1**: rules 3, 28-29 | **W3**: indicators 88-89 | **W7**: regulatory framework

Constitute the public hospital waste team

Rule 4(1) specifies the public hospital team. The MS chairs it; a designated member serves as waste management officer and secretary.

Clinical and operational members

- Heads of all departments; infection-control officer; chief pharmacist; radiology officer; senior matron.
- Head of administration; hospital engineer; head of sanitation staff; any additional hospital staff designated by the MS.

External members and working rules

- A district-administration public representative nominated under rule 4(1)(k), and an EPA representative. Check the current nomination route for legacy post titles.
- Notify duties in writing. Meet at least monthly; one-third of members is the quorum. Where listed posts do not exist, designate staff under rule 4(4).

The Rules use “Medical Superintendent” to mean the hospital head, whatever the designation (rule 2(xv)); confirm the lawful institutional role.

Sources: **W1**: rules 2(xv), 4-6

Make responsibility visible in daily work

The waste management officer coordinates the system. Department heads remain responsible for waste generated in their own departments.

Role	What the MS should check
MS / institutional head	Team, resources, current plan, decisions, training and the required waste audit arrangements.
Department heads	Correct segregation, staff knowledge, supervision and correction of failures.
Waste management officer	Collection, secure storage, records, transport, incident review and daily follow-up.
Specialist leads	Pharmacy, radiology, infection control, nursing and engineering controls within their functions.

Rule 7 includes an external waste-audit arrangement in consultation with the stated district authority; confirm the current designated office.

Sources: **W1**: rules 7-14

Build a plan that matches the actual hospital

Rule 15 requires the waste management officer to prepare the plan for approval by the hospital waste management team.

01 Waste map

Every generating area, collection point, route and storage site.

02 Supplies

Container types, bags, trolleys, quantities and costs.

03 People

Written duties, staffing and training arrangements.

04 Timetable

Collection frequencies and the treatment schedule.

05 Special waste

Separate methods and responsible specialist leads.

06 Failure plan

Breakdowns, missed collections, spills and emergencies.

Consult the relevant local council in preparing and finalising the plan. Review it when the service or waste pathway changes.

Sources: **W1**: rule 15

Classify the waste before choosing its route

A waste item can have more than one hazard. Its appearance alone does not show that it is safe.

Waste group	Examples	Main control question
Non-risk	Uncontaminated paper and packaging.	Has it stayed separate from risk waste?
Infectious / pathological	Contaminated dressings, tissues, blood.	Which validated treatment is suitable?
Sharps	Needles, blades and broken sharp items.	Can the container prevent injury and retrieval?
Special risk	Medicines, chemicals and radioactive material.	Which specialist route and authority apply?

Use the legal classification and the actual hazard. Waste from a hospital is not automatically all infectious, or all safe.

Sources: **W1**: rule 2 | **W5**: types of waste

Reduce avoidable waste safely

Preventing unnecessary waste reduces storage, handling and treatment demands. Patient care and infection control remain the first requirements.

Before the item becomes waste

- Order against need, rotate dated stock and avoid excessive packaging where suitable products are available.
- Use separate routes for appropriate clean recyclables and agreed supplier returns. Check who receives each material.

Keep reuse within its safe scope

- Rule 22 permits a planned reuse system for items designed for reuse and suitable for the approved sterilisation process.
- Do not sell contaminated items into informal recycling or invent a reuse process for a single-use item. Investigate unexplained removal of waste.

A lower recorded risk-waste weight is not an improvement if infectious material has moved into the general-waste stream.

Sources: **W1**: rule 22 | **W5**: waste minimisation

Apply the Punjab colours and container rules

Rule 16 places segregation at the point where the waste is generated. The person producing the waste must use the correct container.

Stream	Punjab rule	Key limit
Routine risk waste	Strong yellow bag in the specified suitable lidded container.	Rule 16(3) excludes sharps and listed special wastes from this ordinary route.
Sharps	Yellow container resistant to penetration and leakage; labelled for contaminated sharps.	Close at three-quarters full, or earlier if its marked limit requires.
Non-risk waste	Suitable container lined with a white bag.	Maintain separation during collection and transport.

Yellow bags must be removed when no more than three-quarters full. Colour alone does not make a leaking or unsuitable container safe.

Sources: **W1**: rule 16(3)-(7), (12)

Prevent injury at the sharps container

Place the correct container within easy reach of the procedure. Staff must be able to dispose of a sharp without carrying it across the room.

Contain immediately and safely

- Use a secure container that allows one-handed disposal and prevents removal of its contents. Never push a hand into it, compact its contents or empty it for reuse.
- Do not recap routinely, bend, break or remove a contaminated needle by hand. Gloves do not make these actions safe.

Resolve the legal and technical method

- Rule 16(2) requires listed used equipment and supplies to be made non-reusable at the point of use. Do not turn that wording into an instruction for unsafe manual handling.
- Have infection control and technical leads agree a safe, device-specific procedure consistent with EPA directions, the law and sharps-injury prevention.

Cleaning staff must not hand-sort bags to correct a segregation error. Isolate the problem and escalate it to the waste management officer.

Sources: **W1**: rules 14(d), 16(2), (6)-(7) | **W8**: chapter 2

Give medicine waste a pharmacy-led route

Expired, recalled, damaged and unwanted medicines require identification and controlled handling before any disposal decision.

Identify and secure

- Separate stock from usable medicines. Record product, batch, quantity, reason and relevant hazard; prevent unauthorised recovery or use.
- Rule 16(8) addresses supplier return of large pharmaceutical quantities. Confirm a documented, lawful return and final handling route.

Apply the additional controls

- Cytotoxic medicines, which can damage cells, and controlled drugs need their specific procedures and permissions. The ordinary waste contract may not cover them.
- Keep stock adjustment, financial write-off, authorised destruction and evidence of final treatment linked. A waste receipt is not approval to destroy a controlled medicine.

Do not crush medicines or empty them into drains as an informal disposal method. Use the approved pharmacy procedure for the actual product.

Sources: **W1**: rules 10, 16(8), 20 | **W6**: pharmaceutical waste guidance

Keep chemical and radioactive routes separate

A yellow infectious-waste bag is not a universal container for every hazardous substance.

Chemicals and heavy metals

- Identify the substance and hazards; use compatible, labelled containers and segregate incompatible chemicals under the approved procedure.
- Rule 16(9) excludes large chemical quantities and high mercury or cadmium content from incineration; use the specified specialist treatment route.

Radioactive waste

- Involve the responsible radiation-protection personnel. Keep the source, activity, date, storage and transfer records required by the authorised programme.
- Apply PNRA licence conditions and authorised clearance or discharge criteria. A general waste officer must not declare an item non-radioactive from its age alone.

Account for combined hazards: clearance from radiation control does not remove a remaining infection or chemical hazard.

Sources: **W1**: rules 11, 16(9)-(11), 19(5)-(6) | **W7**: radioactive waste safety

Close and label the package before removal

Collection follows the plan and occurs at least daily. Arrange earlier collection where workload, fill level or safety requires it.

1	**Check the package**	Confirm correct segregation, safe fill level, suitable container and no leak or protruding sharp.
2	**Close and label**	For yellow bags record the date, generating location, quantity and waste description, with the biohazard symbol.
3	**Move safely**	Use trained staff and required protective clothing. Handle the sealed package without compressing it.
4	**Replace and record**	Fit the correct new bag or container immediately. Clean the reusable bin and record the collection.

If a bag leaks or contains a protruding sharp, control the area and use the trained response procedure; do not continue normal handling.

Sources: **W1**: rules 16(4)-(5), 17

Keep internal transport separate and direct

Waste movement must not create a new exposure in corridors, lifts, food routes or patient waiting areas.

Trolleys and handlers

- Use separate, correctly marked trolleys for yellow-bag risk waste and white-bag non-risk waste. Keep them clean and free of sharp edges.
- Use suitable protective clothing, load without tearing packages and clean the trolley according to the procedure.

Route and destination

- Follow the designated route directly to the central storage facility. Do not leave bags temporarily in an unapproved corridor or open yard.
- Plan timing and access with clinical and facilities teams. Keep clean supplies, food and waste movements separated in the working arrangements.

The route must still work at night, during busy clinics and when the usual lift or corridor is unavailable.

Sources: **W1**: rule 18(1)-(4)

Control access and time in central storage

The storage room is a controlled part of the waste system. It is not a general store or an overflow cleaning cupboard.

Physical controls

- Rule 19 requires a separate, marked risk-waste store with secure access, suitable capacity, cleanable surfaces, water, drainage, lighting and ventilation.
- Keep it away from food areas and inaccessible to animals, insects and birds. Use separate specialist storage for chemical and radioactive waste.

Time and records

- Record waste type, weight and entry and exit times. The normal central-storage limit is 24 hours.
- Rule 19(4) provides an emergency exception for infectious waste held beyond 24 hours: refrigeration at 3-8°C. Keep this controlled, documented and escalated.

The exception is not a routine collection schedule. Rule 14 also requires the waste officer to prevent waste remaining on hospital premises beyond 24 hours.

Sources: **W1**: rules 14(b)-(c), 19

Act before a failed collection becomes a crisis

A contingency plan must be usable before the store reaches its safe capacity or a time limit is missed.

1	**Confirm the risk**	Check the oldest waste, current volume, temperature where relevant and the reason for the failure.
2	**Protect the store**	Maintain segregation and access control. Arrange safe capacity within the authorised system; no open dumping.
3	**Activate the alternative**	Call the approved backup provider or treatment route. Confirm permissions, vehicle, capacity and receiving site.
4	**Escalate and record**	Notify the waste officer and MS; involve EPA or specialist authorities as required. Document the decision and follow-up.

An emergency does not authorise an unapproved contractor or disposal site. Address authority and safe handling together.

Sources: **W1**: rules 15(2)(g), 19-20, 28

Check EPA authorisation before the agreement

A procurement decision and an environmental authorisation answer different questions. The contract file needs both where applicable.

Rule 28 and the EPA order

- Rule 28 requires hospital management to apply to EPA for authorisation in favour of the qualified body, firm or company handling its risk waste.
- The EPA order dated 4 November 2025 reinforces prior authorisation and the official online application route.

What to verify in the file

- Check the hospital, named handler, covered waste, site, activity, validity and conditions against the actual service offered.
- The order set 15 December 2025 as its application deadline. This is a past deadline; verify compliance and any later directions rather than treating it as a new grace period.

Keep the issued authorisation and its conditions. An application receipt or a contractor’s brochure is not the issued approval.

Sources: **W1**: rule 28 | **W2**: paragraphs 2, 8, 10

Follow each consignment beyond the hospital gate

A consignment is a batch sent together. Rule 18 requires a transport note; link it to receipt, treatment and final disposal.

01 Origin

Hospital, department or store and consignment identity.

02 Contents

Waste type, package count, weight and hazard details.

03 Dispatch

Date, time, vehicle and named handing-over staff.

04 Receipt

Named receiving facility, time and accepted quantity.

05 Treatment

Method, batch or process record and any rejection.

06 Final route

Residue or final disposal evidence and unresolved gaps.

This is a suggested tracking format. A signed collection slip proves a handover; it does not alone prove completed treatment.

Sources: **W1**: rules 3, 18(5)(g), 20

Choose treatment by hazard and authorised scope

Rule 20 requires a suitable method with validation and monitoring. Validation means evidence that the process achieves its intended result.

Waste / issue	Management decision
Suitable infectious waste	Use the approved treatment process and verified operating conditions; check its capacity and performance.
Sharps	Keep injury protection through treatment and final disposal. Do not release loose treated sharps.
Chemicals, medicines, radiation	Confirm the separate specialist route; infection treatment alone may leave these hazards unchanged.
Failed treatment batch	Hold it, investigate and arrange authorised retreatment or disposal. Record its final outcome.

Check load suitability, process records, required tests and release criteria. Buying an autoclave does not by itself establish a validated waste-treatment system.

Sources: **W1**: rule 20(1)-(5) | **W4**: treatment framework

An incinerator is not a universal disposal solution

Some wastes require a different route. Burning the wrong material or operating badly can create harmful emissions and hazardous residues.

Before and during operation

- Rule 20(5) requires the hospital’s disposal method to have the environmental impact assessment approval stated in the rule. Check the current EPA approval and operating conditions.
- Use competent operators, suitable accepted waste, maintained equipment and required performance and emissions monitoring.

After the waste is treated

- Rule 20(6) requires risk waste delivered to an incinerator to be burned within 24 hours. Record the receipt and treatment times.
- Account for ash and residues and use the authorised final route. Open burning or delivery to an uncontrolled dump is not evidence of safe disposal.

WHO advises considering suitable non-incineration options where they can be operated and maintained safely; EPA approval remains necessary.

Sources: **W1**: rule 20(5)-(7) | **W5**: environmental impact and treatment choices

Manage liquid waste and effluent deliberately

A drain is a transport route, not proof that a hazardous substance has been treated.

Identify the discharge

- Rule 20(12) requires liquid infectious waste to be properly treated and disinfected before sewer discharge.
- Rule 20(2) requires periodic testing of treatment effluent against the applicable environmental quality standards before discharge.

Apply the correct specialist control

- Laboratory chemicals, pharmaceuticals and radioactive liquids need their own assessment, segregation and authorised route.
- Keep sampling results, treatment records, discharge conditions and corrective actions. Escalate treatment failure and protect the receiving drainage system.

Do not dilute hazardous chemicals or medicines simply to dispose of them through a sink. Radioactive discharge must meet PNRA authorisation.

Sources: **W1**: rule 20(2), (12) | **W7**: authorised discharge limits

Train and equip every person in the waste pathway

Include temporary staff, night teams and contractor workers. Attendance at a lecture is not enough; observe whether the person can perform the task.

Practical protection

- Provide the required task-specific protective clothing and supplies, safe containers, hand hygiene and a clean place to change.
- Arrange occupational-health assessment and recommended immunisation under the approved staff-health programme, including hepatitis B protection where indicated.

Training and support

- Teach classification, colour coding, fill limits, handling, reporting and the immediate response to an exposure or spill.
- PHC indicator 89 expects induction, refresher and change-related training. Check understanding through observation and simple task demonstrations.

Protective gloves are one control. They do not justify hand-sorting, overfilled containers or unsafe lifting.

Sources: **W1**: rules 7, 9, 12, 17, 21 | **W3**: indicator 89 | **W8**: occupational exposure

Respond to a spill or sharps exposure immediately

The response depends on the hazard. Use the approved emergency procedure and obtain urgent clinical assessment for an exposure.

1	**Protect people**	Stop the unsafe activity, restrict access and alert the trained response team. Evacuate the affected area if needed.
2	**Arrange urgent care**	A puncture, splash or other exposure needs prompt first aid and clinical assessment under the staff-exposure protocol.
3	**Contain and clean**	Trained personnel use the correct spill kit and method. Chemical or radioactive incidents require specialist advice.
4	**Record and prevent**	Report the event and near misses; investigate causes, replace used supplies and verify corrective action.

Do not delay exposure assessment while completing forms or locating a supervisor. Clinical treatment follows the current approved protocol.

Sources: **W1**: rule 21 | **W8**: occupational exposure management

Keep evidence that connects the whole pathway

A useful record shows what happened to the waste. Several unrelated signed registers can still leave a major gap.

01 Authority

Team order, duties, current plan and approvals.

02 Generation

Department, waste type, date, quantity and unit.

03 Movement

Collection, storage entry and exit, handovers.

04 Treatment

Receiving site, process record and final route.

05 People

Training, observed competence and incident follow-up.

06 Oversight

Inspections, meeting decisions and verified closure.

Use consistent consignment identities, units and time periods. Correct an error with a visible audit trail, not an invented backdated record.

WORKING METHOD | Illustrative material is identified in the text.

Worked example: reconcile the store balance

Teaching calculation: all figures are invented. This checks risk-waste stock held in one store over one reporting day.

Opening stock	40 kg in the store at the start of the period.
Waste received	160 kg entered the store during the period.
Documented dispatch	150 kg left with recorded handover evidence.
Expected closing	40 + 160 - 150 = 50 kg.
Observed closing	A safe, consistent weighing method gives 45 kg. Difference: 45 - 50 = -5 kg; five kilograms are unexplained.

Investigate timing, weighing, duplicates, leakage and missing movements. A difference is a finding to explain, not automatic proof of theft.

TEACHING CASE | Illustrative material is identified in the text.

Worked example: inspect segregation correctly

Teaching calculation: inspect containers visually and safely. Never empty bags or hand-sort risk waste for this exercise.

Defined sample	Inspect 40 waste stations against the same checklist.
Result	32 stations meet every selected criterion; 8 do not.
Calculation	32 / 40 x 100 = 80% of sampled stations meeting all selected criteria.
Next step	List the eight failures by location and type. Correct immediate hazards, then repeat a comparable check.
Limit of the result	This is a local inspection result, not a statutory pass mark or proof of compliance with every waste rule.

Do not average away a serious hazard. One protruding sharp or uncontrolled chemical container still requires immediate action.

TEACHING CASE | Illustrative material is identified in the text.

Worked example: check a waste-service bill

Teaching calculation: the invented contract pays PKR 80 per accepted kilogram. Apply the actual contract in a live case.

Accepted quantity	Hospital and receiving records agree on 1,200 kg for the billing period.
Expected charge	1,200 x PKR 80 = PKR 96,000, before any separately applicable taxes or adjustments.
Supplier claim	The bill states 1,350 kg x PKR 80 = PKR 108,000.
Unexplained difference	150 kg and PKR 12,000 require reconciliation before certification.
Safety evidence	Also check the agreed treatment and disposal evidence. A correct price calculation does not prove that the waste was treated.

Comparisons need the same service scope. A low price excluding transport, testing or residue disposal may not represent a lower total cost.

TEACHING CASE | Illustrative material is identified in the text.

Use a short waste-safety dashboard

These are suggested local measures. Define the data source, owner, review frequency and action trigger for each one.

Measure	What it should reveal
Missed collection / excess holding	Oldest waste, reason, containment and recovery action.
Segregation failures	Location, hazard and observed correction; retain the sampling method.
Unclosed waste trails	Consignments without receipt, treatment or final-destination evidence.
Worker incidents	Exposure or spill, urgent care, cause and preventive action.
Overdue decisions	Approval gaps, repairs, supplies or contractor actions awaiting closure.

Waste per occupied bed-day can support comparison, but outpatient work and service mix may change the figure. State what activity is included.

WORKING METHOD | Illustrative material is identified in the text.

Teaching case: the contractor does not arrive

All people, events and hospital details in this teaching example are invented. They do not describe an actual hospital event.

At 09:00	The waste officer reports that the contractor’s vehicle has failed. The oldest infectious waste entered central storage at 10:00 yesterday.
Further findings	The room is near capacity. No functioning emergency refrigerated storage is available. A local transporter offers to remove the waste immediately.
Missing evidence	The proposed transporter cannot show the relevant authorisation or name an approved receiving site.
Your decision	What immediate controls, escalation and alternative arrangements are needed? What evidence must be kept?

Write the response before reading the next page. Do not assume that an urgent offer is a lawful and safe disposal route.

TEACHING CASE | Illustrative material is identified in the text.

Case response: control the risk and the authority gap

The normal central-storage limit will be reached at 10:00. The 3-8°C emergency exception cannot be met with a failed or absent refrigerator.

1	**Act before 10:00**	Alert the MS and waste team. Confirm the inventory, oldest time, safe capacity and any immediate exposure.
2	**Reject the unsafe shortcut**	Do not release risk waste to an unverified handler or unknown site. Preserve secure, segregated containment.
3	**Escalate for a safe route**	Activate a pre-authorised alternative, confirm receipt capacity and involve EPA or the responsible authority urgently where needed.
4	**Close the event**	Record times, decisions, consignment evidence and final disposal. Investigate the failure and repair the contingency arrangement.

Where no compliant immediate solution is available, record the actual breach and urgent mitigation honestly; paperwork cannot erase elapsed time.

Sources: **W1**: rules 3, 15, 19, 28 | **W2**: prior authorisation

Three checks before signing the waste report

Write your answer and the reason before turning to the next page.

1. Shared trolley

White bags and yellow bags travel together on the same trolley because both are sealed.

Is sealing enough to make this arrangement compliant?

2. Closing stock

Opening 20 kg, receipts 100 kg and dispatch 90 kg. The physical count gives 25 kg.

What is expected, and what difference must be investigated?

3. Collection receipt

The contractor provides a signed collection slip but no receiving or treatment evidence.

Can you conclude that final disposal is complete?

Use the specific requirement and explain the missing evidence; avoid relying on verbal assurance.

TEACHING CASE | Illustrative material is identified in the text.

Answers and reasons

Use the evidence, the calculation and the cited source.

1. No: separate the transport streams.

Rule 18(3) requires separate, correspondingly marked trolleys for yellow-bag risk waste and white-bag non-risk waste. Sealing does not remove this requirement.

2. Expected 30 kg; five kilograms are unexplained.

20 + 100 - 90 = 30 kg expected. Physical stock is 25 kg, so physical minus expected is -5 kg. Check records, time boundaries and the weighing method before deciding the cause.

3. No: the waste trail remains incomplete.

A collection slip supports handover. Obtain linked receipt and treatment/final-destination evidence, investigate any gap and escalate. Rule 3 keeps the hospital responsible through final disposal.

An honest unresolved finding is more useful than a completed checklist unsupported by evidence.

Sources: **W1**: rules 3, 18, 20

Review one hospital waste pathway

Use a non-confidential real case or the invented examples in this lecture.

Map the pathway

Choose one ward or service. Show generation, collection, storage, transport, treatment and final destination.

Check and trace

Check controls and approvals. Trace one consignment through receipt, treatment and final disposal.

Prepare the action list

State each gap, immediate protection, responsible person, decision needed and completion date.

Review with the waste management officer, infection-control lead and relevant specialist. Use anonymised or invented examples for public teaching.

For the MS: know the hazard, the responsible person, the authorised route and the evidence that closes the waste trail.

WORKING METHOD | Illustrative material is identified in the text.

Sources and continued use | 1

Select a source title or its official-source link to open the document.

W1

Punjab Hospital Waste Management Rules, 2014

Punjab Gazette, 30 July 2014. Rules 3-22: responsibility and waste handling; rules 23-28: oversight and authorisation. Read with later applicable orders.

Government of the Punjab; Environment Protection Department | **Official source** | **Official legal instruments catalogue**

W2

Order on authorisation of bodies handling hospital risk waste

No. 404/PA/DG/EPA/2025, 4 November 2025. Prior authorisation and online applications under rule 28. The December 2025 deadline is historical; check later directions.

Environmental Protection Agency, Punjab | **Official source**

W3

Minimum Service Delivery Standards for Hospitals

PHC, 2024 cover edition; CG-01MS-Ed2-01092023. Indicators 88-89 address the waste plan, team, facilities, supplies and staff training. Read all applicable infection-control and facility standards together.

Punjab Healthcare Commission | **Official source**

Educational material by Dr Qurban Hussain Khan. Source editions are stated; verify later amendments and applicable institutional orders before live use.

Sources and continued use | 2

Select a source title or its official-source link to open the document.

W4

Safe management of wastes from health-care activities, second edition

WHO, 2014; ISBN 9789241548564. International handbook on waste planning, handling, treatment, staff protection and emergencies. It supports technical design; it does not replace Punjab requirements.

World Health Organization | **Official source**

W5

Health-care waste

WHO fact sheet, 24 October 2024. Explains waste categories, health and environmental hazards, waste reduction and treatment choices. Global estimates are not a target for an individual hospital.

World Health Organization | **Official source**

W6

Safe management of pharmaceutical waste from health care facilities: global best practices

WHO, 21 February 2025; ISBN 9789240106710. Apply with local medicine law and the authorised disposal route.

World Health Organization | **Official source**

Educational material by Dr Qurban Hussain Khan. Source editions are stated; verify later amendments and applicable institutional orders before live use.

Sources and continued use | 3

Select a source title or its official-source link to open the document.

W7

Radioactive waste safety and applicable regulations

Catalogue includes PAK/915 (Rev.1), 2019. Apply current regulations, facility licence conditions and the authorised radiation-protection programme.

Pakistan Nuclear Regulatory Authority | **Official source** | **Regulations catalogue**

W8

WHO best practices for injections and related procedures toolkit

WHO, 2010; ISBN 9789241599252. Chapter 2: preventing sharps injuries. Chapter 4: occupational exposure management. International safety guidance.

World Health Organization | **Official source** | **WHO chapter hosted by NCBI**

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