MODULE 11 | EQUIPMENT, MAINTENANCE, ASSETS AND DISPOSAL

Planning, Selecting and Accepting Hospital Equipment

46

LECTURE

Practical hospital governance in Punjab, Pakistan

Start with the service the patient needs.
Accept equipment only against checked requirements.

AUTHOR

Dr Qurban Hussain Khan

Edition 1.0 | 5 October 2026

SELF-STUDY PDF

Turn an equipment request into a working service

For the Medical Superintendent (MS): a machine is useful only when the service, staff, site, supplies and approvals are ready.

- Explain the patient need and compare options.
- Check the complete cost and approval route.
- Define the requirements before inviting bids.
- Verify acceptance and readiness before use.

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 checked equipment proposal and an acceptance-and-handover file.

Module 11 | Presentation 1 of 3. Allow 45-60 minutes with exercises. All explanations are on the pages; check the cited sources before live use.

The three lectures

Follow equipment from the original need to its final authorised disposal.

Lecture	Main question	Practical output
46	What should be obtained, and when is it ready?	Equipment proposal and acceptance file.
47	How will it remain safe and available?	Maintenance and service-continuity review.
48	Who holds it, and how may it leave the system?	Asset verification and disposal file.

Clinical judgement, technical certification and financial approval are different responsibilities.

WORKING METHOD | Illustrative material is identified in the text.

Start with the service problem

Suggested approach: describe the patient problem before naming a machine.

Define the need

- State the service, patients affected, workload and current delay or safety problem.
- Explain what improvement is expected and how it will be measured. Include access for patients who currently cannot receive the service.

Test the cause

- Check staffing, appointment design, repairs, consumables and referral arrangements before assuming new equipment is the solution.
- Check how the proposed equipment fits the approved scope of service and the hospital plan.

A long waiting list can reflect several constraints. Buying one device does not prove that the full pathway will improve.

Sources: **E1**: indicator 122 | **E5**: needs assessment

Give each decision a responsible owner

Suggested responsibility map; use the institution's actual delegated powers.

Role	Main contribution	Evidence
Clinical users	Clinical need, safe use and service requirements.	Signed request and clinical assessment.
Engineering / technical team	Site suitability, testing and maintenance needs.	Technical assessment and test records.
Finance / procurement	Funding, lawful purchasing and contract controls.	Approval and procurement record.
MS / competent authority	Coordinate the decision and approve within powers.	Reasoned decision and escalation.

Include nursing, infection prevention, IT, estates and other specialists when the equipment affects their work.

WORKING METHOD | Illustrative material is identified in the text.

What PHC expects from equipment management

Standard 22 connects the equipment plan with the service actually provided.

Indicator	Expectation	Evidence to review
122	Plan acquisition, installation, testing, calibration, inventory and formal disposal.	Resourced plan and equipment records.
123	Select equipment through a collaborative process.	End-user input, priorities and recorded decisions.
124	Use qualified and trained operators and maintainers.	Credentials, training and outsourced arrangements.
125	Document inspection, servicing, calibration and maintenance.	Schedule and completed work records.

PHC describes a selection committee as preferable. Do not treat that wording as a universal statutory committee composition.

Sources: **E1**: indicators 122-125

Keep the approval questions separate

Suggested authority checklist. One approval rarely answers every question.

Question	What establishes the answer
May this service operate?	Institutional scope, PHC requirements and specialist licences where applicable.
May this device be supplied?	Applicable DRAP product and establishment status, with any valid exception documented.
May public funds be committed?	Budget, competent sanction and current delegation of financial powers.
May this unit be used now?	Installation, testing, trained staff and documented clinical release.

A tender award does not establish clinical readiness. A delivery receipt does not establish technical acceptance.

WORKING METHOD | Illustrative material is identified in the text.

Check the lawful device and supply route

DRAP means the Drug Regulatory Authority of Pakistan. Check the current Medical Devices Rules and relevant amendments.

Check the exact product

- Identify the manufacturer, model, intended use and regulatory category. Match the supplied configuration to the evidence.
- Confirm the applicable enlistment, registration or other lawful route. Verify any claimed exemption instead of assuming it.

Check the responsible establishment

- Verify the relevant manufacturer or importer authorisation and the supplier's documented connection to the lawful supply chain.
- Record the evidence and validity. Seek written clarification where the product status or route is uncertain.

A foreign approval, distributor letter or brochure does not by itself answer all Pakistan regulatory questions.

Sources: **E3**: regulatory framework and amendments

Radiation equipment needs its own regulatory review

PNRA means the Pakistan Nuclear Regulatory Authority. Obtain specialist advice early in planning.

Ionising-radiation services

- For X-ray, CT, fluoroscopy and radioactive-source services, establish the relevant facility, source and activity authorisations.
- Include radiation-protection expertise, site requirements, commissioning checks and the applicable licence conditions before operation.

Other equipment risks

- MRI and ultrasound are not ionising-radiation services. They still need the appropriate technical and clinical safety arrangements.
- For MRI, involve the responsible team on magnetic-field safety, controlled access, compatible equipment and emergency arrangements.

A hospital licence does not replace a separate applicable radiation authorisation. Do not commission specialist systems through an informal demonstration.

Sources: **E1**: indicator 121 | **E4**: licensing guidance

Prepare a short equipment request

Suggested request format for the clinical department.

01 Need

Describe the patient and service problem.

02 Workload

Show activity, demand and the current gap.

03 Existing stock

List suitable equipment and its condition.

04 Options

Compare repair, transfer and new supply.

05 Resources

Identify staff, space and continuing costs.

06 Outcome

State the expected result and review measure.

Attach evidence rather than repeating an unsupported request from the previous year.

WORKING METHOD | Illustrative material is identified in the text.

Check usable capacity before adding equipment

Suggested review: installed equipment, functional equipment and delivered service are different counts.

Physical position

- Check the asset register against the clinical area. Record each unit's location, condition, age, service history and current use.
- Identify idle units and the reason: fault, missing accessories, staff absence, lack of consumables or unsuitable space.

Service position

- Check when the equipment and trained staff are available together, with the required supporting services.
- Examine cancellations, referral delays and queues. Confirm that another machine addresses the actual constraint.

Capacity belongs to the working service. An installed machine without the required staff and supplies is not available capacity.

WORKING METHOD | Illustrative material is identified in the text.

TEACHING CASE

A machine is not the same as a staffed session

Invented planning example. Assume every appointment uses one machine for 30 minutes.

Machine window	The machine can be used for 6 hours daily: 360 / 30 = 12 theoretical slots.
Staffing window	The trained team is available for 5 hours: 300 / 30 = 10 theoretical slots.
Monthly estimate	At 20 staffed days, 10 x 20 = 200 theoretical slots, not 240.
Limits	Allow separately for cleaning, checks, breaks, case complexity, downtime and missed appointments.

The calculation is a capacity estimate, not a safe staffing ratio or a promise that 200 procedures will be completed.

TEACHING CASE | Illustrative material is identified in the text.

Compare more than one solution

Suggested option appraisal before procurement; each route still needs the correct authority.

Option	Question to test	Hidden requirement
Repair / upgrade	Can it safely restore the required service?	Support, remaining life and further testing.
Internal transfer	Is suitable equipment available elsewhere?	Transfer approval and effect on the other service.
Purchase / lease	Which arrangement fits use and funding?	Continuing costs, ownership and exit terms.
External service	Can another provider meet the need reliably?	Access, quality, transport and lawful contract.

Record why the preferred option is suitable and why the other realistic options were not selected.

WORKING METHOD | Illustrative material is identified in the text.

Write requirements that can be checked

Punjab Procurement Rule 10 requires specifications that allow the widest possible competition.

Define the clinical function

- State the intended use, essential performance, patient range and operating conditions in measurable terms.
- Include compatible accessories, consumables, cleaning requirements, training and after-sales support where needed.

Keep the evaluation fair

- The rule generally requires generic specifications. Its limited brand-reference provision uses the words "or equivalent".
- Document genuine compatibility needs and how equivalent performance will be assessed. Do not copy a preferred brochure as an unexplained specification.

Confirm the applicable text and any relevant exception. Technical preferences must be supported by the service need.

Sources: **E2**: rule 10

Confirm that the site can support the equipment

Suggested site-readiness checklist, completed by the relevant technical teams.

01 Space

Access, floor loading, layout and safe movement.

02 Power

Supply quality, earthing and backup needs.

03 Utilities

Water, drainage, gases, ventilation and cooling.

04 Safety

Infection control, fire and specialist hazards.

05 Digital links

Network, software, records and access controls.

06 People

Operators, maintainers and emergency cover.

Record each required site change, cost, responsible person and completion date before committing to installation.

WORKING METHOD | Illustrative material is identified in the text.

Specify the complete operating package

Suggested checklist: an essential dependency omitted from the tender can prevent the service from starting.

Dependency	What to establish
Accessories and consumables	Correct quantities, compatibility, shelf-life, supply route and continuing price basis.
Software and data	Required licences, interfaces, updates, access rights, backup and support period.
Cleaning and preparation	Approved methods, compatible materials, training and required facilities.
Maintenance and parts	Service manuals, test tools, parts availability, support arrangements and exclusions.

Consumable or software dependence can continue for years. Include it in both the cost review and the contract review.

WORKING METHOD | Illustrative material is identified in the text.

Compare costs over a stated period

Invented example in PKR million. Both options provide the same assumed service for five years.

Cost item	Option A	Option B
Purchase	10.0	12.0
Site and installation	2.0	1.0
Running cost: five years	5 x 1.6 = 8.0	5 x 1.1 = 5.5
End-of-use cost	0.3	0.3
Total	20.3	18.8

Assume no residual value or double-counted costs. This simplified total excludes discounting, inflation, tax differences and uncertainty.

TEACHING CASE | Illustrative material is identified in the text.

TEACHING CASE

Interpret the comparison before making a decision

Continue the invented example: Option A totals PKR 20.3 million; Option B totals PKR 18.8 million.

Difference	20.3 - 18.8 = PKR 1.5 million lower modelled cost for B.
Test the inputs	Confirm useful period, workload, price basis, included maintenance and consumables.
Test the risk	Check service quality, supplier support, downtime and sensitivity to changing assumptions.
Separate the decision	A planning calculation supports appraisal. It is not authority to change tender evaluation after bids are received.

A lower purchase price and a lower total cost are different findings. Neither removes the need for safe performance and lawful approval.

TEACHING CASE | Illustrative material is identified in the text.

Use only the published bid-evaluation method

Punjab Procurement Rules 31 and 32 require clear criteria in the bidding documents and evaluation against those criteria.

Before invitation

- Define the required technical evidence and the permitted financial comparison method.
- If lifecycle costs are to affect evaluation, state the method, inputs, period and treatment of comparable costs in advance.

During evaluation

- Apply the disclosed method consistently and retain the calculation and technical reasons.
- Do not add an undisclosed preference, new scoring weight or new cost method because one result seems more attractive.

WHO planning guidance supports appraisal. It does not replace Punjab procurement rules or the issued bidding documents.

Sources: **E2**: rules 31-32 | **E6**: procurement guidance

Secure the full funding and approval route

Suggested approval-file checklist; no universal MS spending limit is assumed.

01 Budget

Identify the correct head and available funding.

02 Authority

Check current delegation and competent sanction.

03 Route

Confirm institutional and procurement approvals.

04 Site work

Include installation and enabling works.

05 Running costs

Fund staff, supplies, servicing and licences.

06 Milestones

Link commitments and payments to agreed terms.

Capital funding for a purchase does not automatically fund the annual cost of running the service.

Sources: **E2**: rule 11

Agree acceptance and warranty terms before supply

Suggested contract review. The actual signed terms determine the parties' obligations.

Term	What needs to be clear
Delivery and installation	Items, configuration, accessories, site work, dates and responsible parties.
Acceptance	Tests, pass criteria, records, authorised signatories and defect resolution.
Training and support	Who is trained, competence evidence, documents, service cover and parts.
Warranty and payment	Start event, coverage, exclusions, notices and payment milestones.

Do not assume warranty always starts at delivery or always at commissioning. Check the agreed clause and record the actual date.

WORKING METHOD | Illustrative material is identified in the text.

Donated or used equipment needs the same scrutiny

WHO's 2024 donation guidance addresses suitability and the responsibilities of both parties.

Before accepting

- Check clinical need, ownership, lawful transfer, condition, support and the remaining useful service that can reasonably be expected.
- Confirm the cost of transport, refurbishment, installation, training, consumables and disposal. Record any donor conditions.

Before clinical use

- Complete the required regulatory, technical and institutional checks. Obtain manuals, service history and essential accessories.
- Identify who pays for faults and continuing support. Complete testing and staff training before release.

Zero purchase price does not mean zero cost. Donation does not waive product, radiation, safety or public-asset requirements.

Sources: **E7**: donation suitability and responsibilities

Keep the four handovers distinct

Suggested workflow. Use the names and milestones stated in the actual contract and institutional procedure.

1	**Receipt**	Count and identify what arrived; record visible condition and missing items.
2	**Installation**	Connect and configure the system at a site confirmed suitable by the responsible team.
3	**Acceptance**	Test the agreed requirements and record pass, failure or outstanding conditions.
4	**Clinical release**	Confirm trained staff, safe procedures, supplies and permission to start the service.

One person may participate in several checks, but one signature must not silently certify checks that were never performed.

WORKING METHOD | Illustrative material is identified in the text.

Record a complete physical receipt

Suggested joint store and technical check.

01 Identity

Manufacturer, model, serial number and asset ID.

02 Quantity

Main unit, accessories and supplied items.

03 Condition

Damage, seals, transport and packaging.

04 Documents

Order, delivery note, manuals and certificates.

05 Difference

Missing or incorrect items and required action.

06 Custody

Safe holding location and responsible person.

Signing for receipt of a package is not confirmation that the equipment meets its clinical specification.

WORKING METHOD | Illustrative material is identified in the text.

Technical acceptance requires recorded tests

DRAP rule 55 requires safety and performance verification before acceptance for use. PHC also expects testing before use.

Before testing

- Confirm the protocol, manufacturer instructions, contract requirements and the competent people performing the checks.
- Use suitable calibrated test equipment where required. Confirm the site and utilities before testing the device.

Record the result

- Identify the device and configuration, tests, results, acceptance criteria, date and responsible personnel.
- Document failures and restrictions. A demonstration that the screen turns on does not establish safe performance.

Specialist systems may need additional regulatory commissioning and quality-assurance checks. Use the relevant qualified team.

Sources: **E1**: indicators 122 and 124 | **E3**: rules 55(2)(b) and 58

Check readiness for the first patient

Suggested readiness review. DRAP rules 57 and 58 require trained operators and technical personnel.

01 People

Competent operators and the approved cover.

02 Procedure

Safe-use and emergency instructions.

03 Supplies

Compatible consumables and accessories.

04 Cleaning

Validated or approved reprocessing arrangements.

05 Records

Patient links, access and data recovery.

06 Backup

A safe response if the device fails.

If a necessary condition is missing, record the restriction and the safe alternative. Opening a new room does not establish service readiness.

Sources: **E3**: rules 57-58

Create one traceable handover file

Suggested file contents linked to the equipment's unique asset identity.

Record group	What to retain
Authority and purchase	Approved need, sanction, procurement decision and signed contract.
Identity and site	Serial and asset numbers, location, custodian and configuration.
Acceptance and training	Receipt, installation, tests, defects, training and release decision.
Continuing support	Warranty, contacts, manuals, maintenance plan and next required checks.

Keep the clinical equipment record and financial asset record consistent. Neither replaces the other.

Sources: **E3**: rule 55(2)(c) | **E8**: equipment information and records

Certify the milestone that has actually been met

Suggested contract-management discipline for payment, warranty and defect follow-up.

Check the evidence

- Compare the invoice with the contract milestone, receipt records and required acceptance evidence.
- Identify missing items, failed tests and disputed terms clearly. Refer the decision to the authorised contract and finance officers.

Preserve contractual rights

- Issue timely documented notices through the agreed route and track the required response.
- Apply only the contract and lawful powers for withholding, deductions, replacement or other remedies. Obtain advice where disputed.

Never issue a false completion certificate to close a budget year. Do not invent a payment condition that the contract does not contain.

WORKING METHOD | Illustrative material is identified in the text.

TEACHING CASE

Delivered, but not ready for clinical use

Invented example: a new device arrives with its main unit and accessories.

Finding	The qualified team records failure of one required safety test.
Immediate response	Keep the unit out of clinical use, identify its status and preserve the test result.
Supplier action	Send the documented defect through the contract route and arrange authorised correction and repeat testing.
Service response	Maintain a safe clinical alternative; certify only milestones actually met and refer payment questions under the contract.

A delivery note cannot cancel a failed acceptance test. The clinical team needs a clear, documented release decision.

TEACHING CASE | Illustrative material is identified in the text.

Follow each equipment project to actual service

Suggested review at agreed project milestones.

01 Need

Is the original service problem still defined?

02 Authority

Are funds and required approvals in place?

03 Readiness

Are site, staff and supplies ready on time?

04 Acceptance

Which tests and defects remain open?

05 Support

Are warranty and maintenance active?

06 Outcome

Has the service improvement been measured?

Give every open issue a responsible person, decision date and evidence needed for closure.

WORKING METHOD | Illustrative material is identified in the text.

Apply the equipment-planning principles

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

1. Lower price

A device has the lowest purchase price but high running costs.

What comparison is needed before procurement?

2. Missing power

A donated device arrives before its required power supply is ready.

Can receipt be treated as clinical acceptance?

3. New scoring

After bids open, the team wants to add a new lifecycle-cost score.

Can it change the published evaluation method?

Explain the planning, safety or legal reason for each answer.

TEACHING CASE | Illustrative material is identified in the text.

Answers and reasons

Use the evidence, the calculation and the cited source.

1. Compare the full service cost and suitability

State the period, workload, included costs and assumptions. Consider safety and support. Any bid-evaluation method must be disclosed as required before bidding.

2. No: complete the readiness and acceptance checks

Record receipt and the site gap separately. Protect the device, complete authorised site work and required testing, and obtain the release decision before use.

3. No undisclosed change to the evaluation method

Apply the published criteria and applicable rules. A later preference cannot be used to retrospectively change how bids are assessed.

A sound purchase connects patient need, lawful approval, checked delivery and a functioning service.

Sources: **E1**: indicator 122 | **E2**: rules 31-32

Prepare one equipment proposal and acceptance plan

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

Service need

State the problem, existing capacity and realistic options.

Resources

Record total costs, funding, site needs and authority.

Acceptance

Define tests, handover records and release responsibilities.

Review with the clinical user, technical team, finance and procurement staff. Use non-confidential evidence.

Keep assumptions, approvals and unresolved conditions visible throughout the project.

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.

E1

PHC hospital Minimum Service Delivery Standards

2024 manual, CG-01MS-Ed2-01092023. Standard 22, indicators 122-125: planning, collaborative selection, qualified staff and maintenance. Indicator 121 addresses applicable licences and certificates.

Punjab Healthcare Commission | **Official source**

E2

Punjab Procurement Rules 2014

Official compilation amended up to 30 April 2025. Rules 10-11: specifications and approval; rules 31-32: published evaluation criteria. Check later valid amendments and the rules applying to the procurement.

Punjab Public Procurement Regulatory Authority | **Official source** | **Current legal framework**

E3

Medical Devices Rules, 2017 and amendments

Base rules, read with later amendments and current decisions. Rules 55 and 57-58 cover acceptance, maintenance and trained personnel. Establishment authorisation and product status are separate checks.

Drug Regulatory Authority of Pakistan | **Official source** | **2025 amendment**

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.

E4

PNRA public guidance and radiation-protection regulations

Check the current licence and authorisation for the radiation facility, source and activity. Ionising-radiation requirements differ from the safety arrangements for MRI and ultrasound.

Pakistan Nuclear Regulatory Authority | **Official source** | **Radiation protection: PAK/904 Rev. 1**

E5

Needs assessment for medical devices

WHO medical device technical series, 2011. A planning reference for identifying needs and assessing available resources. It does not confer public expenditure powers.

World Health Organization | **Official source**

E6

Procurement process resource guide

WHO medical device technical series, 2011. International guidance on equipment procurement and its connection with planning and implementation. Punjab rules govern the applicable public procurement.

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.

E7

Medical device donations: considerations for solicitation and provision

Second edition, 29 July 2024. Donation suitability, donor-recipient responsibilities and planning before, during and after transfer. Local legal and financial authority remains necessary.

World Health Organization | **Official source**

E8

Inventory and maintenance management information system for medical devices

WHO, 2025. Current guidance for equipment information and maintenance records; builds on the 2011 inventory and computerised maintenance management guides.

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.